Yankee Chemistry Spectrum name: 101_16NOV2004_0723.An1

Sample description
FSS-OOL-05-01-022-B SOIL

Spectrum Filename: C:\My Documents\FSS_ReanalysisArea\101_16NOV2004_0723.An1

Acquisition information
Start time: 16-Nov-2004 07:25:14
Live time: 2000
Real time: 2003
Dead time: 0.14 %
Detector ID: 1

Detector system
Det 101- DSPE-633

Calibration
Filename: D1_1LSa.Clb
Detector 101 1.0 Liter Marinelli Sand

Energy Calibration
Created: 03-Sep-2004 08:50:48
Zero offset: 0.244 keV
Gain: 0.500 keV/channel
Quadratic: -2.493E-08 keV/channel^2

Efficiency Calibration
Created: 03-Sep-2004 08:52:26
Type: Polynomial
Uncertainty: 0.626 %
Coefficients: -0.321775 -5.816463 0.734234
-0.099357 0.006049 -0.000149

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.23keV)
Stop channel: 4000 (1999.11keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 1.8470E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.8470E+03) =
5.4142E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00

```
Systematic error:           1.0000000E+00
Fraction Limit:             0.000%
```

Yankee Chemistry Spectrum name: 101_16NOV2004_0723.An1

Background width: average of five points.
Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	10-Nov-2004 15:05:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	1010K_Background_Det101.Pbc 17-May-2004 16:32:19
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 14 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.0733

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
74.77	196.	23.69	1.50	1.654E-02	74.81	9.600	9.052E-01	PB212
77.07	268.	16.68	1.50	1.720E-02	77.11	10.700	1.065E+00	PB214
					77.11	17.500	6.512E-01	PB212
77.07	268.	16.68	1.50	1.720E-02	77.11	10.700	1.065E+00	PB214
					77.11	17.500	6.512E-01	PB212
87.59	111.	39.71	1.50	1.910E-02	86.45	32.740	PBC<MDA	EU155
					88.04	3.790	1.115E+00	CD109
92.98	143.	30.11	1.50	1.985E-02	92.38	2.570	2.058E+00	TH234
					92.80	3.000	1.759E+00	TH234
92.98	159.	26.40	1.50	1.989E-02	92.38	2.570	2.285E+00	TH234
					92.80	3.000	1.953E+00	TH234
186.34	92.	32.18	1.16	1.856E-02	185.99	3.280	1.106E+00	RA226
209.70	86.	29.43	1.14	1.719E-02				
238.73	746.	4.30	1.12	1.557E-02	238.63	43.100	8.127E-01	PB212
					241.92	7.470	4.742E+00	PB214
241.95	96.	21.52	1.12	1.540E-02				
270.26	104.	21.36	1.25	1.400E-02				
295.26	146.	12.57	1.16	1.292E-02				
295.26	146.	12.57	1.16	1.292E-02	295.22	19.200	4.292E-01	PB214
338.01	146.	17.28	1.03	1.136E-02	338.40	12.010	7.842E-01	AC228
351.97	247.	8.38	1.28	1.093E-02				
351.97	247.	8.38	1.28	1.093E-02	351.99	37.100	4.462E-01	PB214
462.93	57.	28.82	1.57	8.352E-03				
462.93	57.	28.82	1.57	8.352E-03	463.51	10.000	5.001E-01	SB125
511.01	113.	17.37	0.98	7.586E-03	510.72	22.500	4.849E-01	TL208
583.20	251.	9.12	1.31	6.684E-03	583.14	86.000	3.197E-01	TL208

609.29	210.	9.16	1.22	6.413E-03	609.32	46.090	5.196E-01	BI214
726.63	58.	35.63	1.57	5.447E-03	727.17	11.800	6.641E-01	BI212
860.93	67.	21.49	1.26	4.675E-03				
911.10	133.	10.54	1.72	4.446E-03	911.07	29.000	7.529E-01	AC228
968.95	70.	15.40	1.57	4.212E-03	968.90	17.460	6.964E-01	AC228
1120.13	62.	21.79	1.69	3.711E-03	1120.28	15.040	8.154E-01	BI214

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pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
1460.67	570.	4.39	1.98	2.943E-03	1460.75	10.700	1.323E+01	K40
1764.02	30.	20.37	0.78	2.481E-03	1764.51	15.920	5.519E-01	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
419.08	209.70	252.	86.	0.043	88.28	1.141	NP-239	s
477.16	238.76	141.	746.	0.373	12.90	1.122	PB-212	D
483.61	241.98	165.	96.	0.048	64.55	1.124	PB-214	D
540.24	270.26	158.	104.	0.052	64.08	1.253	AC-228	s
1722.15	860.93	39.	67.	0.033	53.92	1.256	TL-208	s

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-212	149.10	74.77	985.	196.	0.098	71.07	1.499
PB-214	153.79	77.11	865.	268.	0.134	50.04	1.499D
PB-212	153.79	77.11	865.	268.	0.134	50.04	1.499D
EU-155	174.75	87.59	910.	111.	0.055	119.14	1.499
TH-234	185.54	92.98	862.	143.	0.072	90.34	1.499s
TH-234	185.55	92.98	805.	159.	0.080	79.21	1.499s
RA-226	371.88	186.11	460.	88.	0.044	108.38	1.499s
PB-212	477.18	238.74	397.	603.	0.302	18.58	1.499
PB-214	477.09	238.69	424.	419.	0.209	25.50	1.499s
PB-214	590.53	295.39	208.	136.	0.068	51.89	1.499
AC-228	675.64	337.93	273.	148.	0.074	68.82	1.029s
PB-214	703.70	351.95	91.	241.	0.120	25.62	1.499
SB-125	926.01	463.06	84.	48.	0.024	91.91	1.499s
TL-208	1021.97	511.01	83.	113.	0.057	52.10	0.979s
TL-208	1166.40	583.20	83.	251.	0.126	27.35	1.313
BI-214	1218.61	609.29	55.	210.	0.105	27.48	1.224s
BI-212	1453.41	726.63	96.	58.	0.029	106.90	1.575s
AC-228	1822.55	911.10	27.	133.	0.066	31.61	1.725
AC-228	1938.31	968.95	22.	70.	0.035	46.20	1.569
BI-214	2240.58	1120.00	36.	35.	0.017	89.29	1.713
K-40	2922.35	1460.67	14.	570.	0.285	13.18	1.979
BI-214	3529.48	1764.02	2.	30.	0.015	61.10	0.780s

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	Peak MDA Value pCi/gm	COMMENTS
BE-7		3.1177E-02					
			477.56	3.118E-02	%(	4.572E-01 1.32E-01	G
K-40		1.3234E+01					
			1460.75	1.323E+01	(	4.753E-01 5.81E-01	G
MN-54		-1.6733E-03					
			834.81	-1.673E-03	%(	6.086E-02 1.73E-02	G
CO-57		-6.7730E-03					
			122.07	-6.773E-03	%(P	5.109E-02 1.52E-02	G K
			136.43	5.724E-02	%	4.052E-01 1.21E-01	G
CO-60		6.1857E-03					
			1332.51	6.186E-03	%(P	6.567E-02 1.75E-02	G K
			1173.23	1.547E-02	% P	6.256E-02 1.74E-02	G K
Sr-85		-1.6108E-02					
			514.00	-1.611E-02	%(	5.644E-02 1.68E-02	G
Kr-85		-3.5001E+02					
			513.99	-3.500E+02	%(	1.226E+03 3.65E+02	G
Y-88		-7.8809E-04					
			1836.01	-7.881E-04	&(P	2.355E-02 3.19E-03	G K
			898.02	-2.670E-03	% P	6.238E-02 1.74E-02	G
NB-94		2.5981E-03					
			871.10	2.598E-03	%(	4.110E-02 1.14E-02	G K
			702.50	-1.122E-02	&	5.778E-02 1.69E-02	G K
Ag-108M		-1.1789E-02					
			722.95	-1.179E-02	&(	7.585E-02 2.22E-02	G K
			614.37	-3.676E-03	%	4.250E-02 1.20E-02	G
			433.93	-7.362E-03	%	4.551E-02 1.33E-02	G
CD-109		0.0000E+00					
			88.04	0.000E+00	%(	1.527E+00 4.55E-01	G

Yankee Chemistry Spectrum name: 101_16NOV2004_0723.An1

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SN-113	-5.7726E-03						
		391.71	-5.773E-03	%(P	6.723E-02	1.95E-02	G K
		255.04	-1.961E-01	&	2.045E+00	6.04E-01	G
SB-125	7.8788E-02						
		427.95	-3.737E-02	%(	1.386E-01	4.11E-02	G K
		600.77	0.000E+00	%	2.277E-01	6.40E-02	G
		636.15	3.809E-02	%	3.934E-01	1.12E-01	G
		463.51	4.226E-01	*(	4.002E-01	1.29E-01	G
		176.29	3.683E-02	%	6.505E-01	1.93E-01	G
I-131	2.6146E-02						
		364.48	2.615E-02	%(	5.887E-02	1.78E-02	G K
		636.97	9.066E-02	%	9.306E-01	2.65E-01	G
		284.29	8.794E-02	&	1.040E+00	3.06E-01	G
CS-134	-1.3073E-02						
		604.66	-1.307E-02	%(	4.922E-02	1.45E-02	G K
		795.76	3.180E-02	%	5.191E-02	1.61E-02	G
		569.29	7.079E-02	&	2.686E-01	7.90E-02	G
		801.84	5.151E-03	&	5.292E-01	1.47E-01	G
CS-137	4.4118E-04						
		661.62	4.412E-04	%(	5.515E-02	1.56E-02	G
CE-139	-5.3961E-03						
		165.85	-5.396E-03	&(P	5.177E-02	1.54E-02	G
EU-152	-2.4150E-02						
		121.78	-2.415E-02	%(	1.535E-01	4.59E-02	G K
		344.30	-5.982E-03	&	1.490E-01	4.34E-02	G
		1408.08	1.298E-01	%	2.280E-01	7.11E-02	G
		964.00	1.152E-03	&	5.481E-01	1.57E-01	G
		1112.07	-4.139E-03	%	4.762E-01	1.33E-01	G
		778.90	-2.467E-02	&	3.545E-01	9.99E-02	G
EU-154	4.0674E-04						
		123.10	4.067E-04	&(	1.046E-01	3.11E-02	G K
		1274.80	-4.471E-03	%	1.741E-01	4.80E-02	G
		723.30	2.836E-03	&	2.457E-01	6.91E-02	G
		1004.80	4.454E-02	&	3.069E-01	8.74E-02	G
EU-155	1.2976E-01						
		86.45	1.298E-01	(	1.680E-01	5.15E-02	G K
		105.31	4.033E-02	%	2.078E-01	6.23E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
HG-203	1.8561E-02						
		279.17	1.856E-02	&(P	4.597E-02	1.38E-02	G K
		72.87	-7.228E-01	&	1.345E+00	4.09E-01	G
		70.83	-7.946E-02	%	2.271E+00	6.78E-01	G
		82.50	1.843E-01	%	2.337E+00	6.96E-01	G
TL-208	3.1971E-01						
		583.14	3.197E-01	(	5.742E-02	2.91E-02	G
		510.72	4.849E-01	+	1.933E-01	8.43E-02	G
PB-212	6.5586E-01						
		238.63	6.577E-01	(	1.041E-01	4.07E-02	G K
							Energy duplication
		77.11	6.512E-01	(	3.397E-01	1.09E-01	G
		74.81	9.052E-01	&	6.863E-01	2.14E-01	G
PB-214	4.2323E-01						
		351.99	4.349E-01	(	8.521E-02	3.71E-02	G K
		295.22	4.006E-01	(	2.062E-01	6.93E-02	G
							Energy duplication
		77.11	1.065E+00	+	5.556E-01	1.78E-01	G
		241.92	2.662E+00	+	6.272E-01	2.26E-01	G
BI-212	6.6413E-01						
		727.17	6.641E-01	*(	5.502E-01	2.37E-01	G K
		1620.56	-4.566E-02	%	1.556E+00	3.96E-01	G
		785.42	9.222E-01	%	1.884E+00	5.74E-01	G
BI-214	5.1413E-01						
		609.32	5.196E-01	@(	9.234E-02	4.76E-02	G K
		1764.51	5.519E-01	(	1.782E-01	1.12E-01	G
		1120.28	4.573E-01	?(	4.044E-01	1.36E-01	G
RA-224	8.5806E-01						
		241.00	8.581E-01	%(	1.269E+00	3.89E-01	G
RA-226	1.0545E+00						
		185.99	1.054E+00	*(	1.232E+00	3.81E-01	G
AC-228	7.4490E-01						
		911.07	7.529E-01	(	1.535E-01	7.93E-02	G K
		968.90	6.964E-01	(	2.444E-01	1.07E-01	G
		338.40	7.960E-01	@(	4.276E-01	1.83E-01	G
TH-227	-8.7601E-02						
		236.00	-8.760E-02	&(	4.491E-01	1.34E-01	G K
		256.25	-5.890E-02	&	5.891E-01	1.74E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
PA-234	-1.4806E-02						
		98.44	-1.481E-02	&(	1.499E-01	4.46E-02	G K
		946.00	1.132E-01	%	2.520E-01	7.61E-02	G
		131.28	-4.741E-02	%	2.116E-01	6.34E-02	G
		94.67	-6.884E-02	%	3.346E-01	1.00E-01	G
		883.24	7.103E-02	%	3.527E-01	1.01E-01	G
		926.70	1.119E-01	&	3.819E-01	1.11E-01	G
		569.26	1.045E-01	&	3.964E-01	1.17E-01	G
TH-234	1.5220E+00						
		63.29	8.372E-01	%(	2.195E+00	6.63E-01	G K
		92.80	1.953E+00	(	1.654E+00	5.16E-01	G
		92.38	2.058E+00	&(	2.001E+00	6.20E-01	G
AM-241	4.7404E-02						
		59.54	4.740E-02	%(P	2.950E-01	8.82E-02	G

(- This peak used in the nuclide activity average.

* - Peak is too wide, but only one peak in library.
! - Peak is part of a multiplet and this area went negative during deconvolution.
? - Peak is too narrow.
@ - Peak is too wide at FW25M, but ok at FWHM.
% - Peak fails sensitivity test.
$ - Peak identified, but first peak of this nuclide failed one or more qualification tests.
+ - Peak activity higher than counting uncertainty range.
- - Peak activity lower than counting uncertainty range.
= - Peak outside analysis energy range.
& - Calculated peak centroid is not close enough to the library energy centroid for positive identification.
P - Peakbackground subtraction
} - Peak is too close to another for the activity to be found directly.

Nuclide Codes:	Peak Codes:
T - Thermal Neutron Activation	G - Gamma Ray
F - Fast Neutron Activation	X - X-Ray
I - Fission Product	P - Positron Decay
N - Naturally Occurring Isotope	S - Single-Escape
P - Photon Reaction	D - Double-Escape
C - Charged Particle Reaction	K - Key Line
M - No MDA Calculation	A - Not in Average
R - Coincidence Corrected	C - Coincidence Peak
H - Halflife limit exceeded	

- -

Yankee Chemistry Spectrum name: 101_16NOV2004_0723.An1

***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	2.8960E-02	3.1177E-02	3.9635E-01	3.9636E-01	4.247E-01
K-40		1.3234E+01	1.3234E+01	1.7443E+00	1.8979E+00	
MN-54	#A	-1.6523E-03	-1.6733E-03	5.1830E-02	5.1830E-02	6.010E-02
CO-57	#B	-6.6749E-03	-6.7730E-03	5.3651E-02	5.3652E-02	5.035E-02
CO-60	#B	6.1730E-03	6.1857E-03	5.2431E-02	5.2432E-02	6.554E-02
Sr-85	#A	-1.5159E-02	-1.6108E-02	5.0345E-02	5.0353E-02	5.312E-02
Kr-85	#A	-3.4999E+02	-3.5001E+02	1.0938E+03	1.0940E+03	1.226E+03
Y-88	#B	-7.5951E-04	-7.8809E-04	4.7286E-03	4.7288E-03	2.269E-02
NB-94	#B	2.5981E-03	2.5981E-03	3.4067E-02	3.4067E-02	4.110E-02
Ag-108M	#B	-1.1788E-02	-1.1789E-02	6.6603E-02	6.6606E-02	7.585E-02
CD-109	#A	0.0000E+00	0.0000E+00	1.3658E+00	1.3658E+00	1.514E+00
SN-113	#B	-5.5785E-03	-5.7726E-03	9.7147E-02	9.7148E-02	6.496E-02
SB-125	#B	7.8482E-02	7.8788E-02	7.2413E-02	7.2550E-02	1.381E-01
I-131	#B	1.6022E-02	2.6146E-02	5.3326E-02	5.3346E-02	3.607E-02
CS-134	#B	-1.3004E-02	-1.3073E-02	4.3539E-02	4.3545E-02	4.896E-02
CS-137	#A	4.4102E-04	4.4118E-04	4.6674E-02	4.6674E-02	5.513E-02
CE-139	#A	-5.2438E-03	-5.3961E-03	4.7354E-02	4.7355E-02	5.031E-02
EU-152	#B	-2.4130E-02	-2.4150E-02	1.3780E-01	1.3781E-01	1.534E-01
EU-154	#B	4.0622E-04	4.0674E-04	9.3174E-02	9.3174E-02	1.045E-01
EU-155	#A	1.2948E-01	1.2976E-01	1.5459E-01	1.5476E-01	1.677E-01
HG-203	#B	1.7057E-02	1.8561E-02	4.1269E-02	4.1282E-02	4.225E-02
TL-208		3.1971E-01	3.1971E-01	8.7439E-02	8.9285E-02	
PB-212	#	6.5586E-01	6.5586E-01	1.2186E-01	1.2737E-01	1.041E-01
PB-214	#	4.2323E-01	4.2323E-01	1.0842E-01	1.1102E-01	8.521E-02
BI-212	#	6.6413E-01	6.6413E-01	7.0992E-01	7.1092E-01	
BI-214		5.1413E-01	5.1413E-01	1.4129E-01	1.4424E-01	
RA-224	#A	8.5806E-01	8.5806E-01	1.1662E+00	1.1672E+00	1.269E+00
RA-226	#A	1.0545E+00	1.0545E+00	1.1429E+00	1.1444E+00	1.232E+00
AC-228		7.4490E-01	7.4490E-01	2.2026E-01	2.2425E-01	
TH-227	#B	-8.7601E-02	-8.7601E-02	4.0275E-01	4.0278E-01	4.491E-01
PA-234	#B	-1.4806E-02	-1.4806E-02	1.3366E-01	1.3367E-01	1.499E-01
TH-234	#B	1.5220E+00	1.5220E+00	1.2057E+00	1.2086E+00	2.195E+00
AM-241	#A	4.7403E-02	4.7404E-02	2.6460E-01	2.6461E-01	2.949E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

Yankee Chemistry Spectrum name: 101_16NOV2004_0723.An1

---------- S U M M A R Y ----------

Total Activity (270.1 to 1999.1 keV) 1.5477153E+01 pCi/gm
Total Decayed Activity (270.1 to 1999.1 keV) 1.5477153E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
VSB

Reviewed by: _____
Supervisor

Laboratory: Yankee Chemistry

Yankee Chemistry Spectrum name: 101_17NOV2004_0716.An1

Sample description
FSS-OOL-05-01-021-B SOIL

Spectrum Filename: C:\My Documents\FSS_ReanalysisArea\101_17NOV2004_0716.An1

Acquisition information
Start time: 17-Nov-2004 07:17:48
Live time: 2000
Real time: 2003
Dead time: 0.14 %
Detector ID: 1

Detector system
Det 101- DSPE-633

Calibration
Filename: D1_1LSa.Clb
Detector 101 1.0 Liter Marinelli Sand

Energy Calibration
Created: 03-Sep-2004 08:50:48
Zero offset: 0.244 keV
Gain: 0.500 keV/channel
Quadratic: -2.493E-08 keV/channel^2

Efficiency Calibration
Created: 03-Sep-2004 08:52:26
Type: Polynomial
Uncertainty: 0.626 %
Coefficients: -0.321775 -5.816463 0.734234
-0.099357 0.006049 -0.000149

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.23keV)
Stop channel: 4000 (1999.11keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 1.8510E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.8510E+03) =
5.4025E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00

```
Systematic error:           1.0000000E+00
Fraction Limit:             0.000%
```

Yankee Chemistry Spectrum name: 101_17NOV2004_0716.An1

Background width: average of five points.
Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	10-Nov-2004 15:14:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	1010K_Background_Det101.Pbc 17-May-2004 16:32:19
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 11 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.0482

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
74.77	209.	22.98	1.50	1.654E-02	72.87	6.400	1.658E+00	HG203
					74.81	9.600	9.618E-01	PB212
77.04	262.	17.95	1.50	1.720E-02	77.11	10.700	1.040E+00	PB214
					77.11	17.500	6.361E-01	PB212
77.04	262.	17.95	1.50	1.720E-02	77.11	10.700	1.040E+00	PB214
					77.11	17.500	6.361E-01	PB212
86.59	101.	28.36	1.01	1.912E-02	86.45	32.740	1.188E-01	EU155
89.95	83.	32.61	1.02	1.958E-02	88.04	3.790	8.313E-01	CD109
93.48	101.	28.69	1.02	1.997E-02	92.38	2.570	1.445E+00	TH234
					92.80	3.000	1.235E+00	TH234
					94.67	15.500	2.368E-01	PA234
133.53	87.	32.82	0.92	2.101E-02				
185.80	140.	21.43	1.30	1.859E-02				
185.80	140.	21.43	1.30	1.859E-02	185.99	3.280	1.679E+00	RA226
209.26	72.	29.49	0.87	1.722E-02				
238.70	756.	4.32	1.12	1.557E-02				
238.70	756.	4.32	1.12	1.557E-02	238.63	43.100	8.221E-01	PB212
242.22	99.	22.20	1.12	1.539E-02	241.00	3.900	1.195E+00	RA224
					241.92	7.470	6.259E-01	PB214
270.19	74.	26.61	0.83	1.401E-02				
295.29	163.	11.97	1.18	1.292E-02	295.22	19.200	4.797E-01	PB214
338.48	98.	25.15	1.16	1.135E-02	338.40	12.010	5.270E-01	AC228
351.84	273.	10.09	1.03	1.093E-02				
351.84	273.	10.09	1.03	1.093E-02	351.99	37.100	4.918E-01	PB214
463.12	46.	22.52	1.29	8.349E-03				
463.12	46.	22.52	1.29	8.349E-03	463.51	10.000	4.071E-01	SB125

510.72	124.	17.66	1.68	7.590E-03	510.72	22.500	5.322E-01	TL208
583.11	242.	10.24	1.38	6.685E-03	583.14	86.000	3.073E-01	TL208
609.17	195.	10.11	1.41	6.414E-03	609.32	46.090	4.807E-01	BI214
727.31	41.	30.48	1.36	5.442E-03	727.17	11.800	4.683E-01	BI212
911.03	135.	13.85	1.66	4.447E-03	911.07	29.000	7.655E-01	AC228
968.90	102.	15.79	1.49	4.212E-03	968.90	17.460	1.013E+00	AC228

Yankee Chemistry Spectrum name: 101_17NOV2004_0716.An1

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
1120.14	53.	22.54	2.17	3.711E-03	1120.28	15.040	6.985E-01	BI214
1460.71	621.	4.17	1.82	2.943E-03	1460.75	10.700	1.440E+01	K40
1764.53	43.	15.25	2.62	2.481E-03	1764.51	15.920	7.947E-01	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
179.48	89.98	321.	83.	0.041	97.83	1.016	PB-214	lD
418.20	209.26	202.	72.	0.036	88.48	0.875	AC-228	
540.11	270.19	151.	74.	0.037	79.82	0.826	AC-228	

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-212	149.10	74.77	1051.	209.	0.105	68.93	1.499s
PB-214	153.79	77.11	977.	262.	0.131	53.84	1.499D
PB-212	153.79	77.11	977.	262.	0.131	53.84	1.499D
EU-155	173.62	87.02	917.	130.	0.065	102.07	1.499
TH-234	185.58	93.00	873.	138.	0.069	94.29	1.499s
TH-234	185.55	92.99	841.	142.	0.071	90.54	1.499s
PA-234	185.52	92.97	630.	146.	0.073	77.16	1.499s
RA-226	371.80	186.07	388.	121.	0.060	74.53	1.499s
PB-212	476.96	238.63	399.	618.	0.309	18.27	1.499D
RA-224	483.29	241.80	525.	82.	0.041	122.67	1.499
PB-214	590.24	295.25	186.	167.	0.083	41.79	1.499
AC-228	676.74	338.48	184.	98.	0.049	75.45	1.160
PB-214	703.73	351.97	115.	242.	0.121	26.92	1.499
SB-125	926.17	463.14	30.	46.	0.023	67.07	1.499
TL-208	1021.08	510.57	106.	134.	0.067	52.08	1.741s
TL-208	1166.23	583.11	98.	242.	0.121	30.73	1.375
BI-214	1218.37	609.17	71.	195.	0.097	30.34	1.415
BI-212	1454.76	727.31	45.	41.	0.021	91.43	1.358
AC-228	1822.41	911.03	60.	135.	0.068	41.54	1.663
AC-228	1938.22	968.90	45.	102.	0.051	47.38	1.495
BI-214	2240.87	1120.14	29.	53.	0.027	67.63	2.170s
K-40	2922.44	1460.71	11.	621.	0.311	12.51	1.818
BI-214	3530.49	1764.53	0.	43.	0.022	45.75	2.623s

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	MDA Value pCi/gm		COMMENTS
BE-7		7.7223E-02						
			477.56	7.722E-02	%(	4.183E-01	1.22E-01	G
K-40		1.4405E+01						
			1460.75	1.440E+01	(	4.180E-01	6.01E-01	G
MN-54		-2.0788E-04						
			834.81	-2.079E-04	&(	5.941E-02	1.68E-02	G
CO-57		-6.2803E-04						
			122.07	-6.280E-04	&(P	4.866E-02	1.44E-02	G K
			136.43	-7.010E-02	&	4.225E-01	1.26E-01	G
CO-60		-1.8070E-03						
			1332.51	-1.807E-03	&(P	6.295E-02	1.61E-02	G K
			1173.23	-2.838E-02	% P	7.602E-02	2.07E-02	G K
Sr-85		-1.4976E-02						
			514.00	-1.498E-02	%(	6.067E-02	1.80E-02	G
Kr-85		-3.2242E+02						
			513.99	-3.224E+02	%(	1.304E+03	3.87E+02	G
Y-88		7.6570E-03						
			1836.01	7.657E-03	&(P	3.781E-02	1.00E-02	G K
			898.02	-1.580E-02	& P	6.366E-02	1.84E-02	G
NB-94		1.5563E-03						
			871.10	1.556E-03	&(	4.391E-02	1.21E-02	G K
			702.50	-9.663E-03	%	5.335E-02	1.55E-02	G K
Ag-108M		-1.5328E-02						
			722.95	-1.533E-02	&(	5.823E-02	1.71E-02	G K
			614.37	-2.839E-02	%	6.131E-02	1.86E-02	G
			433.93	8.002E-04	%	3.729E-02	1.06E-02	G
CD-109		1.5054E-01						
			88.04	1.505E-01	%(	1.509E+00	4.51E-01	G

Yankee Chemistry Spectrum name: 101_17NOV2004_0716.An1

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SN-113	1.2814E-02						
		391.71	1.281E-02	&(P	5.607E-02	1.64E-02	G K
		255.04	-1.979E-02	%	1.917E+00	5.62E-01	G
SB-125	9.0551E-02						
		427.95	-1.622E-02	&(	1.322E-01	3.85E-02	G K
		600.77	-6.186E-02	%	2.459E-01	7.23E-02	G
		636.15	6.554E-03	%	3.052E-01	8.43E-02	G
		463.51	4.066E-01	(	2.494E-01	9.09E-02	G
		176.29	9.824E-02	&	6.209E-01	1.85E-01	G
I-131	1.7649E-02						
		364.48	1.765E-02	%(	6.948E-02	2.05E-02	G K
		636.97	-9.843E-02	%	9.729E-01	2.77E-01	G
		284.29	-3.143E-01	%	1.202E+00	3.59E-01	G
CS-134	-1.5466E-02						
		604.66	-1.547E-02	%(	5.699E-02	1.69E-02	G K
		795.76	-1.829E-03	%	5.255E-02	1.46E-02	G
		569.29	4.245E-02	%	2.843E-01	8.24E-02	G
		801.84	-6.702E-02	%	5.643E-01	1.61E-01	G
CS-137	1.6674E-02						
		661.62	1.667E-02	%(	6.032E-02	1.78E-02	G
CE-139	1.2741E-02						
		165.85	1.274E-02	&(P	4.969E-02	1.49E-02	G
EU-152	3.1087E-03						
		121.78	3.109E-03	&(	1.446E-01	4.30E-02	G K
		344.30	2.252E-02	%	1.513E-01	4.45E-02	G
		1408.08	-1.139E-02	%	2.333E-01	6.25E-02	G
		964.00	2.100E-02	&	3.264E-01	9.07E-02	G
		1112.07	-1.077E-01	&	3.941E-01	1.15E-01	G
		778.90	-6.586E-02	%	4.382E-01	1.27E-01	G
EU-154	7.4940E-03						
		123.10	7.494E-03	&(	1.011E-01	3.01E-02	G K
		1274.80	-2.137E-02	%	2.173E-01	6.19E-02	G
		723.30	0.000E+00	&	4.380E-01	1.27E-01	G
		1004.80	-6.847E-02	&	3.821E-01	1.11E-01	G
EU-155	1.5248E-01						
		86.45	1.525E-01	(	1.683E-01	5.19E-02	G K
		105.31	4.228E-03	&	1.967E-01	5.84E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
HG-203	2.1076E-02						
		279.17	2.108E-02	%(P	5.232E-02	1.57E-02	G K
		72.87	-5.257E-02	%	1.370E+00	4.10E-01	G
		70.83	-5.524E-01	%	2.463E+00	7.41E-01	G
		82.50	-5.294E-01	%	2.911E+00	8.73E-01	G
TL-208	3.0733E-01						
		583.14	3.073E-01	(	6.203E-02	3.15E-02	G
		510.72	5.711E-01	+	2.171E-01	9.91E-02	G
PB-212	6.6150E-01						
							Energy duplication
		238.63	6.718E-01	(	1.042E-01	4.09E-02	G K
							Energy duplication
		77.11	6.361E-01	(	3.598E-01	1.14E-01	G
		74.81	9.618E-01	&	7.069E-01	2.21E-01	G
PB-214	4.5509E-01						
		351.99	4.367E-01	(	9.505E-02	3.92E-02	G K
		295.22	4.907E-01	(	1.951E-01	6.83E-02	G
							Energy duplication
		77.11	1.040E+00	+	5.885E-01	1.87E-01	G
		241.92	-6.797E-02	%	8.205E-01	2.45E-01	G
BI-212	4.6832E-01						
		727.17	4.683E-01	(	3.853E-01	1.43E-01	G K
		1620.56	1.365E-01	&	1.368E+00	3.53E-01	G
		785.42	5.505E-01	%	2.624E+00	7.63E-01	G
BI-214	4.8068E-01						
		609.32	4.807E-01	(	1.040E-01	4.86E-02	G K
		1764.51	7.947E-01	+	1.362E-01	1.21E-01	G
		1120.28	6.985E-01	+	3.614E-01	1.57E-01	G
RA-224	9.9749E-01						
		241.00	9.975E-01	(	1.327E+00	4.08E-01	G
RA-226	1.4438E+00						
		185.99	1.444E+00	(	1.132E+00	3.59E-01	G
AC-228	8.5832E-01						
		911.07	7.655E-01	(	2.194E-01	1.06E-01	G K
		968.90	1.013E+00	(	3.372E-01	1.60E-01	G
		338.40	5.270E-01	-	3.527E-01	1.33E-01	G
TH-227	-9.7999E-02						
		236.00	-9.800E-02	%(	4.824E-01	1.44E-01	G K
		256.25	-1.558E-02	%	6.250E-01	1.84E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
PA-234	8.9661E-02						
		98.44	-6.612E-02	%(	1.745E-01	5.27E-02	G K
		946.00	6.002E-02	%	2.344E-01	6.80E-02	G
		131.28	-5.468E-02	%	2.241E-01	6.73E-02	G
		94.67	3.419E-01	&(	2.807E-01	8.79E-02	G
		883.24	-5.933E-02	%	4.523E-01	1.29E-01	G
		926.70	-8.243E-02	%	4.810E-01	1.38E-01	G
		569.26	6.250E-02	%	4.192E-01	1.21E-01	G
TH-234	1.4340E+00						
		63.29	8.482E-01	%(	2.192E+00	6.62E-01	G K
		92.80	1.731E+00	*(	1.686E+00	5.22E-01	G
		92.38	1.976E+00	*(	2.009E+00	6.21E-01	G
AM-241	2.8536E-02						
		59.54	2.854E-02	&(P	2.884E-01	8.60E-02	G

(- This peak used in the nuclide activity average.

* - Peak is too wide, but only one peak in library.
! - Peak is part of a multiplet and this area went negative during deconvolution.
? - Peak is too narrow.
@ - Peak is too wide at FW25M, but ok at FWHM.
% - Peak fails sensitivity test.
$ - Peak identified, but first peak of this nuclide failed one or more qualification tests.
+ - Peak activity higher than counting uncertainty range.
- - Peak activity lower than counting uncertainty range.
= - Peak outside analysis energy range.
& - Calculated peak centroid is not close enough to the library energy centroid for positive identification.
P - Peakbackground subtraction
} - Peak is too close to another for the activity to be found directly.

Nuclide Codes:	Peak Codes:
T - Thermal Neutron Activation	G - Gamma Ray
F - Fast Neutron Activation	X - X-Ray
I - Fission Product	P - Positron Decay
N - Naturally Occurring Isotope	S - Single-Escape
P - Photon Reaction	D - Double-Escape
C - Charged Particle Reaction	K - Key Line
M - No MDA Calculation	A - Not in Average
R - Coincidence Corrected	C - Coincidence Peak
H - Halflife limit exceeded	

- -

Yankee Chemistry Spectrum name: 101_17NOV2004_0716.An1

***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	7.0819E-02	7.7223E-02	3.6643E-01	3.6645E-01	3.836E-01
K-40		1.4405E+01	1.4405E+01	1.8018E+00	1.9771E+00	
MN-54	#A	-2.0482E-04	-2.0788E-04	5.0315E-02	5.0315E-02	5.854E-02
CO-57	#B	-6.1737E-04	-6.2803E-04	5.8449E-01	5.8449E-01	4.784E-02
CO-60	#B	-1.8027E-03	-1.8070E-03	6.1556E-02	6.1556E-02	6.280E-02
Sr-85	#A	-1.3945E-02	-1.4976E-02	5.3976E-02	5.3982E-02	5.649E-02
Kr-85	#A	-3.2240E+02	-3.2242E+02	1.1605E+03	1.1607E+03	1.304E+03
Y-88	#B	7.3320E-03	7.6570E-03	3.0012E-02	3.0015E-02	3.620E-02
NB-94	#B	1.5563E-03	1.5563E-03	3.6386E-02	3.6386E-02	4.391E-02
Ag-108M	#B	-1.5326E-02	-1.5328E-02	5.1395E-02	5.1402E-02	5.822E-02
CD-109	#A	1.4901E-01	1.5054E-01	1.3540E+00	1.3540E+00	1.494E+00
SN-113	#B	1.2310E-02	1.2814E-02	4.9342E-02	4.9347E-02	5.386E-02
SB-125	#B	9.0138E-02	9.0551E-02	6.0730E-02	6.0945E-02	1.316E-01
I-131	#B	9.9316E-03	1.7649E-02	6.1514E-02	6.1522E-02	3.910E-02
CS-134	#B	-1.5371E-02	-1.5466E-02	5.0641E-02	5.0649E-02	5.664E-02
CS-137	#A	1.6667E-02	1.6674E-02	5.3413E-02	5.3422E-02	6.029E-02
CE-139	#A	1.2320E-02	1.2741E-02	4.4677E-02	4.4683E-02	4.805E-02
EU-152	#B	3.1056E-03	3.1087E-03	1.2888E-01	1.2888E-01	1.445E-01
EU-154	#B	7.4828E-03	7.4940E-03	9.0236E-02	9.0237E-02	1.009E-01
EU-155	#A	1.5209E-01	1.5248E-01	1.5563E-01	1.5586E-01	1.679E-01
HG-203	#B	1.9085E-02	2.1076E-02	4.7059E-02	4.7074E-02	4.737E-02
TL-208		3.0733E-01	3.0733E-01	9.4437E-02	9.6021E-02	
PB-212	#	6.6150E-01	6.6150E-01	1.2087E-01	1.2652E-01	1.042E-01
PB-214	#	4.5509E-01	4.5509E-01	1.1310E-01	1.1599E-01	9.505E-02
BI-212		4.6832E-01	4.6832E-01	4.2821E-01	4.2903E-01	
BI-214		4.8068E-01	4.8068E-01	1.4585E-01	1.4836E-01	
RA-224	#A	9.9749E-01	9.9749E-01	1.2237E+00	1.2250E+00	1.327E+00
RA-226	#	1.4438E+00	1.4438E+00	1.0761E+00	1.0791E+00	1.132E+00
AC-228		8.5832E-01	8.5832E-01	2.7042E-01	2.7473E-01	
TH-227	#B	-9.7999E-02	-9.7999E-02	4.3323E-01	4.3327E-01	4.824E-01
PA-234	#B	8.9661E-02	8.9661E-02	6.9179E-02	6.9358E-02	1.745E-01
TH-234	#B	1.4340E+00	1.4340E+00	1.2820E+00	1.2845E+00	2.192E+00
AM-241	#A	2.8536E-02	2.8536E-02	2.5792E-01	2.5792E-01	2.884E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

Yankee Chemistry Spectrum name: 101_17NOV2004_0716.An1

---------- S U M M A R Y ----------

Total Activity (50.2 to 1999.1 keV) 1.6519176E+01 pCi/gm
Total Decayed Activity (50.2 to 1999.1 keV) 1.6519176E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
VSB

Reviewed by: _____
Supervisor

Laboratory: Yankee Chemistry

Yankee Chemistry Spectrum name: 101_17NOV2004_1112.An1

Sample description
FSS-OOL-05-01-007-F SOIL DUPLICATE COUNT

Spectrum Filename: C:\My Documents\FSS_ReanalysisArea\101_17NOV2004_1112.An1

Acquisition information
Start time: 17-Nov-2004 11:13:41
Live time: 2000
Real time: 2003
Dead time: 0.13 %
Detector ID: 1

Detector system
Det 101- DSPE-633

Calibration
Filename: D1_1LSa.Clb
Detector 101 1.0 Liter Marinelli Sand

Energy Calibration
Created: 03-Sep-2004 08:50:48
Zero offset: 0.244 keV
Gain: 0.500 keV/channel
Quadratic: -2.493E-08 keV/channel^2

Efficiency Calibration
Created: 03-Sep-2004 08:52:26
Type: Polynomial
Uncertainty: 0.626 %
Coefficients: -0.321775 -5.816463 0.734234
-0.099357 0.006049 -0.000149

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.23keV)
Stop channel: 4000 (1999.11keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 2.0030E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 2.0030E+03) =
4.9925E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00

```
Systematic error:           1.0000000E+00
Fraction Limit:             0.000%
```

Yankee Chemistry Spectrum name: 101_17NOV2004_1112.An1

Background width: average of five points.
Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	10-Nov-2004 09:55:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	1010K_Background_Det101.Pbc 17-May-2004 16:32:19
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 14 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.1457

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
74.62	203.	16.13	1.00	1.651E-02				
74.62	203.	16.13	1.00	1.651E-02	74.81	9.600	8.628E-01	PB212
77.12	349.	9.91	1.01	1.723E-02	77.11	10.700	1.279E+00	PB214
					77.11	17.500	7.820E-01	PB212
86.77	113.	24.74	1.01	1.916E-02	86.45	32.740	1.221E-01	EU155
90.15	80.	32.94	1.02	1.961E-02	88.04	3.790	7.436E-01	CD109
93.21	123.	22.69	1.02	1.995E-02	92.38	2.570	1.629E+00	TH234
					92.80	3.000	1.392E+00	TH234
185.89	130.	22.77	1.07	1.859E-02				
185.89	130.	22.77	1.07	1.859E-02	185.99	3.280	1.435E+00	RA226
209.47	62.	37.20	0.70	1.720E-02				
238.72	732.	4.31	1.12	1.557E-02				
238.72	732.	4.31	1.12	1.557E-02	238.63	43.100	7.359E-01	PB212
241.96	103.	19.11	1.12	1.540E-02	241.00	3.900	1.150E+00	RA224
295.18	174.	15.74	1.10	1.292E-02				
295.18	174.	15.74	1.10	1.292E-02	295.22	19.200	4.727E-01	PB214
300.24	44.	34.62	1.01	1.272E-02				
338.56	146.	16.86	1.03	1.134E-02	338.40	12.010	7.246E-01	AC228
351.90	274.	11.17	0.97	1.093E-02				
351.90	274.	11.17	0.97	1.093E-02	351.99	37.100	4.568E-01	PB214
462.76	49.	27.59	1.50	8.342E-03	463.51	10.000	4.011E-01	SB125
510.97	87.	23.95	1.48	7.587E-03	510.72	22.500	3.445E-01	TL208
583.01	225.	9.46	1.34	6.686E-03	583.14	86.000	2.641E-01	TL208
609.27	188.	9.49	1.26	6.413E-03	609.32	46.090	4.303E-01	BI214
727.49	52.	28.96	0.95	5.441E-03	727.17	11.800	5.483E-01	BI212
794.55	22.	39.92	1.50	5.016E-03	795.76	85.400	PBC<MDA	CS134

860.57	41.	29.72	1.45	4.677E-03				
910.91	150.	11.37	1.55	4.447E-03	911.07	29.000	7.848E-01	AC228
964.71	31.	27.05	1.61	4.228E-03	964.00	14.580	3.344E-01	EU152
968.86	89.	13.42	1.62	4.212E-03	968.90	17.460	8.130E-01	AC228
1120.63	45.	30.06	0.73	3.711E-03	1120.28	15.040	5.440E-01	BI214
1460.69	566.	4.23	1.93	2.943E-03	1460.75	10.700	1.212E+01	K40
1620.27	12.	39.30	2.17	2.682E-03	1620.56	2.750	1.061E+00	BI212

Yankee Chemistry Spectrum name: 101_17NOV2004_1112.An1

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
1764.59	34.	19.76	1.29	2.481E-03	1764.51	15.920	5.824E-01	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
173.11	86.87	333.	113.	0.056	74.22	1.013	TB-160	lD
179.89	90.25	306.	80.	0.040	98.83	1.016	PB-214	lD
418.62	209.47	235.	62.	0.031	111.61	0.701	AC-228	
477.14	238.62	133.	732.	0.366	12.94	1.122	PB-212	D
483.63	241.87	141.	103.	0.051	57.33	1.124	PB-214	D
600.22	300.24	94.	44.	0.022	103.86	1.009	PB-212	
1721.44	860.57	32.	41.	0.020	89.17	1.451	TL-208	
1930.01	964.85	19.	31.	0.015	81.33	1.613	AC-228	D

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-212	149.20	74.82	989.	182.	0.091	76.80	1.499
PB-214	153.79	77.11	875.	301.	0.151	45.08	1.499D
PB-212	153.79	77.11	875.	301.	0.151	45.08	1.499D
TH-234	185.67	93.04	853.	143.	0.071	90.40	1.499s
TH-234	185.61	93.01	838.	141.	0.070	90.91	1.499s
RA-226	371.89	186.12	405.	141.	0.071	65.60	1.499
PB-212	476.96	238.63	398.	604.	0.302	18.58	1.499D
PB-214	590.41	295.33	204.	157.	0.079	45.37	1.499
AC-228	676.91	338.56	160.	146.	0.073	50.58	1.033
PB-214	703.74	351.97	109.	233.	0.117	27.30	1.499
SB-125	925.41	462.76	68.	49.	0.025	82.77	1.499s
TL-208	1021.89	510.97	106.	87.	0.044	71.86	1.478s
TL-208	1166.03	583.01	69.	225.	0.112	28.37	1.340s
BI-214	1218.57	609.27	52.	188.	0.094	28.46	1.261
BI-212	1455.14	727.49	61.	52.	0.026	86.88	0.955s
CS-134	1589.32	794.55	28.	22.	0.011	119.75	1.502s
AC-228	1822.17	910.91	44.	150.	0.075	34.11	1.552
AC-228	1938.21	968.90	26.	89.	0.044	40.25	1.616D
BI-214	2241.84	1120.63	46.	45.	0.023	90.18	0.733s
K-40	2922.40	1460.69	2.	566.	0.283	12.70	1.925

Yankee Chemistry Spectrum name: 101_17NOV2004_1112.An1

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
BI-212	3241.78	1620.27	3.	12.	0.006	117.89	2.173
BI-214	3530.62	1764.59	3.	34.	0.017	59.28	1.285s

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	MDA Value pCi/gm	COMMENTS
BE-7		8.8704E-02					
			477.56	8.870E-02	%(	4.093E-01 1.20E-01	G
K-40		1.2122E+01					
			1460.75	1.212E+01	(	2.095E-01 5.13E-01	G
MN-54		-1.5477E-03					
			834.81	-1.548E-03	%(	4.751E-02 1.33E-02	G
CO-57		-1.3225E-02					
			122.07	-1.323E-02	%(P	4.796E-02 1.44E-02	G K
			136.43	4.611E-05	%	3.748E-01 1.11E-01	G
CO-60		-1.6770E-02					
			1332.51	-1.677E-02	%(P	5.971E-02 1.47E-02	G K
			1173.23	-9.945E-03	& P	6.766E-02 1.78E-02	G K
Sr-85		9.9676E-04					
			514.00	9.968E-04	%(	5.246E-02 1.52E-02	G
Kr-85		2.1035E+01					
			513.99	2.103E+01	%(	1.123E+03 3.24E+02	G
Y-88		-3.0969E-03					
			1836.01	-3.097E-03	%(P	4.429E-02 1.11E-02	G K
			898.02	-9.193E-03	% P	5.188E-02 1.47E-02	G
NB-94		4.0755E-03					
			871.10	4.075E-03	&(	3.747E-02 1.05E-02	G K
			702.50	3.457E-03	%	4.067E-02 1.15E-02	G K
Ag-108M		-2.5874E-04					
			722.95	-2.587E-04	&(	3.773E-02 1.03E-02	G K
			614.37	1.257E-02	%	4.055E-02 1.20E-02	G
			433.93	1.314E-02	%	3.282E-02 9.85E-03	G

Yankee Chemistry Spectrum name: 101_17NOV2004_1112.An1

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CD-109	1.5539E-01						
		88.04	1.554E-01	&(	1.293E+00	3.86E-01	G
SN-113	-1.3378E-03						
		391.71	-1.338E-03	%(P	7.295E-02	2.12E-02	G K
		255.04	2.826E-01	%	1.773E+00	5.25E-01	G
SB-125	1.3991E-01						
		427.95	5.168E-02	%(	1.079E-01	3.27E-02	G K
		600.77	8.836E-02	&	2.009E-01	6.06E-02	G
		636.15	-8.222E-02	%	3.718E-01	1.09E-01	G
		463.51	4.011E-01	*(	3.344E-01	1.11E-01	G
		176.29	1.024E-01	%	5.925E-01	1.77E-01	G
I-131	-1.1607E-02						
		364.48	-1.161E-02	%(	7.794E-02	2.28E-02	G K
		636.97	-1.940E-01	&	9.723E-01	2.82E-01	G
		284.29	2.524E-01	%	1.109E+00	3.30E-01	G
CS-134	1.6281E-02						
		604.66	0.000E+00	&(	9.941E-02	2.93E-02	G K
		795.76	3.489E-02	@(	4.309E-02	1.39E-02	G
		569.29	-6.850E-03	%	3.030E-01	8.69E-02	G
		801.84	1.025E-01	%	4.453E-01	1.29E-01	G
CS-137	8.7021E-03						
		661.62	8.702E-03	&(	5.110E-02	1.48E-02	G
CE-139	-7.7987E-04						
		165.85	-7.799E-04	%(P	3.961E-02	1.17E-02	G
EU-152	-1.9568E-02						
		121.78	-1.957E-02	%(	1.281E-01	3.83E-02	G K
		344.30	-2.931E-02	%	1.350E-01	4.00E-02	G
		1408.08	1.031E-01	&	2.133E-01	6.50E-02	G
		964.00	-1.254E-02	%	9.080E-01	2.67E-01	G
		1112.07	9.945E-02	%	4.110E-01	1.19E-01	G
		778.90	-1.191E-02	%	3.742E-01	1.06E-01	G
EU-154	-8.4063E-04						
		123.10	-8.406E-04	%(	1.013E-01	3.01E-02	G K
		1274.80	-1.139E-03	&	1.668E-01	4.60E-02	G
		723.30	-1.315E-01	&	3.277E-01	9.86E-02	G
		1004.80	1.624E-02	&	2.818E-01	7.88E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
EU-155	-1.1518E-03						
		86.45	-1.152E-03	%(	1.619E-01	4.82E-02	G K
		105.31	3.642E-02	%	1.796E-01	5.38E-02	G
HG-203	-9.0124E-03						
		279.17	-9.012E-03	%(P	5.073E-02	1.48E-02	G K
		72.87	-4.421E-01	%	1.256E+00	3.79E-01	G
		70.83	-1.321E+00	&	2.085E+00	6.36E-01	G
		82.50	-2.640E-01	&	2.390E+00	7.14E-01	G
TL-208	2.6406E-01						
		583.14	2.641E-01	@(	4.861E-02	2.50E-02	G
		510.72	3.445E-01	+	2.001E-01	8.26E-02	G
PB-212	6.2694E-01						
							Energy duplication
		238.63	6.073E-01	(	9.621E-02	3.76E-02	G K
							Energy duplication
		77.11	6.754E-01	(	3.150E-01	1.01E-01	G
		74.81	7.715E-01	&	6.344E-01	1.97E-01	G
PB-214	4.0167E-01						
		351.99	3.885E-01	(	8.545E-02	3.54E-02	G K
		295.22	4.272E-01	(	1.882E-01	6.46E-02	G
							Energy duplication
		77.11	1.105E+00	+	5.151E-01	1.66E-01	G
		241.92	-2.524E-01	%	6.681E-01	2.02E-01	G
BI-212	6.4526E-01						
		727.17	5.483E-01	*(	4.102E-01	1.59E-01	G K
		1620.56	1.061E+00	(	1.034E+00	4.17E-01	G
		785.42	1.004E+00	%	2.095E+00	6.36E-01	G
BI-214	4.5825E-01						
		609.32	4.303E-01	(	8.326E-02	4.08E-02	G K
		1764.51	5.824E-01	+	1.818E-01	1.15E-01	G
		1120.28	5.440E-01	(	4.148E-01	1.64E-01	G
RA-224	6.8597E-01						
		241.00	6.860E-01	%(	1.174E+00	3.58E-01	G
RA-226	1.5613E+00						
		185.99	1.561E+00	(	1.068E+00	3.41E-01	G
AC-228	7.8087E-01						
		911.07	7.848E-01	(	1.759E-01	8.92E-02	G K
		968.90	8.130E-01	(	2.444E-01	1.09E-01	G
		338.40	7.246E-01	(	3.048E-01	1.22E-01	G

Yankee Chemistry Spectrum name: 101_17NOV2004_1112.An1

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TH-227	-6.5502E-02						
		236.00	-6.550E-02	%(	4.415E-01	1.32E-01	G K
		256.25	5.973E-02	%	5.008E-01	1.48E-01	G
PA-234	4.9456E-03						
		98.44	4.946E-03	%(	1.758E-01	5.23E-02	G K
		946.00	0.000E+00	%	3.155E-01	8.93E-02	G
		131.28	0.000E+00	%	2.035E-01	6.04E-02	G
		94.67	-1.049E-01	%	3.196E-01	9.64E-02	G
		883.24	-6.933E-02	%	3.687E-01	1.06E-01	G
		926.70	-3.540E-02	%	4.349E-01	1.23E-01	G
		569.26	-1.010E-02	%	4.466E-01	1.28E-01	G
TH-234	1.3871E+00						
		63.29	9.018E-01	%(	2.055E+00	6.22E-01	G K
		92.80	1.590E+00	(	1.556E+00	4.82E-01	G
		92.38	1.887E+00	(	1.835E+00	5.69E-01	G
AM-241	-7.2890E-02						
		59.54	-7.289E-02	&(P	2.881E-01	8.65E-02	G

(- This peak used in the nuclide activity average.

* - Peak is too wide, but only one peak in library.
! - Peak is part of a multiplet and this area went negative during deconvolution.
? - Peak is too narrow.
@ - Peak is too wide at FW25M, but ok at FWHM.
% - Peak fails sensitivity test.
$ - Peak identified, but first peak of this nuclide failed one or more qualification tests.
\+ - Peak activity higher than counting uncertainty range.
\- - Peak activity lower than counting uncertainty range.
= - Peak outside analysis energy range.
& - Calculated peak centroid is not close enough to the library energy centroid for positive identification.
P - Peakbackground subtraction
} - Peak is too close to another for the activity to be found directly.

Nuclide Codes:	Peak Codes:
T - Thermal Neutron Activation	G - Gamma Ray
F - Fast Neutron Activation	X - X-Ray
I - Fission Product	P - Positron Decay
N - Naturally Occurring Isotope	S - Single-Escape
P - Photon Reaction	D - Double-Escape
C - Charged Particle Reaction	K - Key Line
M - No MDA Calculation	A - Not in Average

R - Coincidence Corrected C - Coincidence Peak
H - Halflife limit exceeded

- -

***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	8.0942E-02	8.8704E-02	3.6070E-01	3.6073E-01	3.735E-01
K-40		1.2122E+01	1.2122E+01	1.5392E+00	1.6847E+00	
MN-54	#A	-1.5237E-03	-1.5477E-03	3.9980E-02	3.9981E-02	4.677E-02
CO-57	#B	-1.2988E-02	-1.3225E-02	4.6597E-02	4.6603E-02	4.710E-02
CO-60	#B	-1.6727E-02	-1.6770E-02	4.4243E-01	4.4243E-01	5.956E-02
Sr-85	#A	9.2435E-04	9.9676E-04	4.5465E-02	4.5465E-02	4.865E-02
Kr-85	#A	2.1034E+01	2.1035E+01	9.7317E+02	9.7318E+02	1.123E+03
Y-88	#B	-2.9581E-03	-3.0969E-03	5.4043E-02	5.4043E-02	4.230E-02
NB-94	#B	4.0755E-03	4.0755E-03	3.1379E-02	3.1380E-02	3.747E-02
Ag-108M	#B	-2.5871E-04	-2.5874E-04	3.1044E-02	3.1044E-02	3.773E-02
CD-109	#A	1.5373E-01	1.5539E-01	1.1595E+00	1.1595E+00	1.279E+00
SN-113	#B	-1.2822E-03	-1.3378E-03	1.5230E-01	1.5230E-01	6.992E-02
SB-125	#F	1.3924E-01	1.3991E-01	1.1581E-01	1.1608E-01	1.074E-01
I-131	#B	-6.3180E-03	-1.1607E-02	6.8506E-02	6.8509E-02	4.243E-02
CS-134	#B	1.6175E-02	1.6281E-02	1.9496E-02	1.9518E-02	9.877E-02
CS-137	#A	8.6983E-03	8.7021E-03	4.4407E-02	4.4410E-02	5.107E-02
CE-139	#A	-7.5262E-04	-7.7987E-04	4.1055E-02	4.1055E-02	3.823E-02
EU-152	#B	-1.9547E-02	-1.9568E-02	1.1475E-01	1.1476E-01	1.279E-01
EU-154	#B	-8.3931E-04	-8.4063E-04	9.0279E-02	9.0279E-02	1.011E-01
EU-155	#B	-1.1487E-03	-1.1518E-03	1.4474E-01	1.4474E-01	1.614E-01
HG-203	#B	-8.1144E-03	-9.0124E-03	9.9480E-02	9.9481E-02	4.568E-02
TL-208	#	2.6406E-01	2.6406E-01	7.4911E-02	7.6383E-02	
PB-212	#	6.2694E-01	6.2694E-01	1.1652E-01	1.2178E-01	9.621E-02
PB-214	#	4.0167E-01	4.0167E-01	1.0635E-01	1.0875E-01	8.545E-02
BI-212		6.4526E-01	6.4526E-01	4.7248E-01	4.7389E-01	
BI-214		4.5825E-01	4.5825E-01	1.3041E-01	1.3296E-01	
RA-224	#A	6.8597E-01	6.8597E-01	1.0737E+00	1.0744E+00	1.174E+00
RA-226	#	1.5613E+00	1.5613E+00	1.0242E+00	1.0280E+00	1.068E+00
AC-228		7.8087E-01	7.8087E-01	1.9023E-01	1.9528E-01	
TH-227	#B	-6.5502E-02	-6.5502E-02	3.9533E-01	3.9535E-01	4.415E-01
PA-234	#B	4.9456E-03	4.9456E-03	1.5701E-01	1.5701E-01	1.758E-01
TH-234	#B	1.3871E+00	1.3871E+00	1.1260E+00	1.1286E+00	2.055E+00
AM-241	#A	-7.2888E-02	-7.2890E-02	2.6363E-01	2.6366E-01	2.880E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.

H - Halflife limit exceeded

Yankee Chemistry Spectrum name: 101_17NOV2004_1112.An1

---------- S U M M A R Y ----------

Total Activity (1120.2 to 1999.1 keV) 1.4270581E+01 pCi/gm
Total Decayed Activity (1120.2 to 1999.1 keV) 1.4270581E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
VSB

Reviewed by: _____
Supervisor

Laboratory: Yankee Chemistry

Yankee Chemistry Spectrum name: 101_17NOV2004_1152.An1

Sample description
FSS-OOL-05-01-007-F SOIL DUPLICATE COUNT

Spectrum Filename: C:\My Documents\FSS_ReanalysisArea\101_17NOV2004_1152.An1

Acquisition information

Start time:	17-Nov-2004 11:53:04
Live time:	2000
Real time:	2003
Dead time:	0.13 %
Detector ID:	1

Detector system
Det 101- DSPE-633

Calibration

Filename:	D1_1LSa.Clb

Detector 101 1.0 Liter Marinelli Sand

Energy Calibration

Created:	03-Sep-2004 08:50:48
Zero offset:	0.244 keV
Gain:	0.500 keV/channel
Quadratic:	-2.493E-08 keV/channel^2

Efficiency Calibration

Created:	03-Sep-2004 08:52:26
Type:	Polynomial
Uncertainty:	0.626 %
Coefficients:	-0.321775 -5.816463 0.734234
	-0.099357 0.006049 -0.000149

Library Files

Main analysis library:	FSS_Rev_1.Lib
Library Match Width:	1.000
Peak stripping:	Library based

Analysis parameters

Analysis engine:	Env32 G53W4.20
Start channel:	100 (50.23keV)
Stop channel:	4000 (1999.11keV)
Peak rejection level:	41.667%
Peak search sensitivity:	3
Sample Size:	2.0030E+03
Activity scaling factor:	1.0000E+06/(1.0000E+00* 2.0030E+03) = 4.9925E+02
Detection limit method:	Nureg 4.16
Random error:	1.0000000E+00

```
Systematic error:           1.0000000E+00
Fraction Limit:             0.000%
```

Yankee Chemistry Spectrum name: 101_17NOV2004_1152.An1

Background width: average of five points.
Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	10-Nov-2004 09:55:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	1010K_Background_Det101.Pbc 17-May-2004 16:32:19
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 13 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.0729

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
74.47	200.	16.74	1.00	1.651E-02				
74.47	200.	16.74	1.00	1.651E-02	74.81	9.600	8.515E-01	PB212
77.24	323.	10.22	1.01	1.730E-02	77.11	10.700	1.185E+00	PB214
					77.11	17.500	7.245E-01	PB212
85.24	86.	32.83	1.31	1.891E-02				
85.24	86.	32.83	1.31	1.891E-02	86.45	32.740	9.310E-02	EU155
92.95	110.	38.74	1.50	1.989E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	1.246E+00	TH234
185.68	105.	25.07	1.67	1.860E-02	185.99	3.280	1.159E+00	RA226
238.75	670.	4.59	1.12	1.557E-02	238.63	43.100	6.737E-01	PB212
242.20	82.	24.35	1.12	1.539E-02	241.00	3.900	9.174E-01	RA224
295.34	147.	12.10	1.16	1.292E-02	295.22	19.200	4.003E-01	PB214
338.82	183.	14.12	1.20	1.134E-02	338.40	12.010	9.038E-01	AC228
352.06	256.	11.02	1.15	1.092E-02	351.99	37.100	4.256E-01	PB214
464.04	70.	24.81	1.65	8.332E-03	463.51	10.000	5.648E-01	SB125
510.71	115.	15.99	1.57	7.591E-03	510.72	22.500	4.527E-01	TL208
583.22	218.	10.65	1.38	6.684E-03	583.14	86.000	2.554E-01	TL208
609.30	187.	9.73	1.47	6.413E-03	609.32	46.090	4.259E-01	BI214
727.31	33.	35.37	1.50	5.443E-03	727.17	11.800	PBC<MDA	BI212
911.23	152.	9.85	1.16	4.446E-03	911.07	29.000	7.953E-01	AC228
968.96	100.	19.98	1.42	4.212E-03	968.90	17.460	9.174E-01	AC228
1119.92	60.	23.59	1.23	3.712E-03	1120.28	15.040	7.253E-01	BI214
1460.73	552.	4.40	1.87	2.943E-03	1460.75	10.700	1.184E+01	K40
1763.52	39.	17.72	2.28	2.481E-03	1764.51	15.920	6.729E-01	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
148.51	74.72	463.	200.	0.100	50.22	1.005	BI-207	D
154.05	77.48	384.	323.	0.162	30.65	1.007	PB-214	D

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-212	149.11	74.77	1096.	186.	0.093	78.67	1.499s
PB-214	153.79	77.11	974.	297.	0.148	47.89	1.499D
PB-212	153.79	77.11	974.	297.	0.148	47.89	1.499D
TH-234	185.48	92.95	857.	110.	0.055	116.22	1.499
RA-226	371.01	185.68	278.	105.	0.052	75.22	1.669s
PB-212	477.15	238.72	321.	568.	0.284	18.38	1.499
RA-224	483.12	241.71	419.	78.	0.039	117.07	1.499
PB-214	590.46	295.36	164.	144.	0.072	45.30	1.499
AC-228	677.42	338.82	155.	183.	0.091	42.35	1.196s
PB-214	703.81	352.01	112.	231.	0.116	27.65	1.499
SB-125	926.13	463.12	68.	46.	0.023	87.74	1.499s
TL-208	1021.36	510.71	71.	115.	0.057	47.98	1.570s
TL-208	1166.45	583.22	86.	218.	0.109	31.96	1.375
BI-214	1218.64	609.30	49.	187.	0.093	29.20	1.470
BI-212	1454.78	727.31	52.	33.	0.017	106.10	1.499s
AC-228	1822.81	911.23	24.	152.	0.076	29.54	1.158
AC-228	1938.34	968.96	68.	100.	0.050	59.94	1.423
BI-214	2240.42	1119.92	39.	60.	0.030	70.78	1.230
K-40	2922.47	1460.73	13.	552.	0.276	13.21	1.873
BI-214	3528.48	1763.52	3.	39.	0.020	53.17	2.279s

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	MDA Value pCi/gm	COMMENTS
BE-7		1.3294E-01					
			477.56	1.329E-01	%(	3.872E-01	1.15E-01 G
K-40		1.1837E+01					
			1460.75	1.184E+01	(	4.125E-01	5.21E-01 G
MN-54		7.4050E-03					
			834.81	7.405E-03	%(	3.857E-02	1.10E-02 G
CO-57		7.2313E-03					
			122.07	7.231E-03	%(P	4.493E-02	1.34E-02 G K
			136.43	1.666E-02	&	2.972E-01	8.80E-02 G
CO-60		7.1530E-03					
			1332.51	7.153E-03	%(P	5.099E-02	1.32E-02 G K
			1173.23	6.359E-03	% P	6.379E-02	1.74E-02 G K
Sr-85		-2.2503E-02					
			514.00	-2.250E-02	%(	5.290E-02	1.60E-02 G
Kr-85		-4.8165E+02					
			513.99	-4.816E+02	%(	1.132E+03	3.42E+02 G
Y-88		6.5352E-03					
			1836.01	6.535E-03	%(P	4.327E-02	1.15E-02 G K
			898.02	-4.910E-03	% P	4.342E-02	1.19E-02 G
NB-94		6.6405E-03					
			871.10	6.640E-03	&(	3.649E-02	1.04E-02 G K
			702.50	-1.278E-03	&	4.879E-02	1.39E-02 G K
Ag-108M		-1.0803E-02					
			722.95	-1.080E-02	%(	5.443E-02	1.59E-02 G K
			614.37	-1.077E-02	%	5.287E-02	1.55E-02 G
			433.93	4.920E-03	&	4.137E-02	1.20E-02 G
CD-109		2.9519E-01					
			88.04	2.952E-01	%(	1.387E+00	4.17E-01 G
SN-113		-1.3482E-03					
			391.71	-1.348E-03	%(P	5.511E-02	1.57E-02 G K
			255.04	3.975E-01	%	1.751E+00	5.21E-01 G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	1.2257E-01						
		427.95	3.744E-02	%(	1.188E-01	3.53E-02	G K
		600.77	-1.213E-02	%	1.946E-01	5.50E-02	G
		636.15	9.375E-02	&	3.372E-01	9.90E-02	G
		463.51	3.746E-01	*(	3.339E-01	1.10E-01	G
		176.29	-2.212E-01	&	6.052E-01	1.82E-01	G
I-131	1.4399E-02						
		364.48	1.440E-02	%(	7.602E-02	2.24E-02	G K
		636.97	-2.962E-02	&	1.047E+00	2.96E-01	G
		284.29	-7.256E-02	&	1.105E+00	3.24E-01	G
CS-134	-1.0738E-02						
		604.66	-1.074E-02	%(	4.072E-02	1.20E-02	G K
		795.76	2.308E-03	%	4.462E-02	1.24E-02	G
		569.29	5.451E-02	&	2.416E-01	7.06E-02	G
		801.84	-1.278E-01	%	5.364E-01	1.56E-01	G
CS-137	8.2240E-03						
		661.62	8.224E-03	%(	4.215E-02	1.22E-02	G
CE-139	-1.0500E-03						
		165.85	-1.050E-03	&(P	4.825E-02	1.43E-02	G
EU-152	2.9814E-02						
		121.78	2.981E-02	%(	1.278E-01	3.83E-02	G K
		344.30	-4.039E-02	%	1.403E-01	4.18E-02	G
		1408.08	2.344E-02	%	2.291E-01	6.29E-02	G
		964.00	2.316E-01	%	3.930E-01	1.21E-01	G
		1112.07	-6.469E-02	%	4.062E-01	1.16E-01	G
		778.90	-6.994E-02	%	3.216E-01	9.31E-02	G
EU-154	-2.0297E-02						
		123.10	-2.030E-02	%(	9.842E-02	2.95E-02	G K
		1274.80	-4.196E-02	%	1.903E-01	5.53E-02	G
		723.30	-5.306E-02	%	2.606E-01	7.61E-02	G
		1004.80	6.183E-02	%	3.040E-01	8.79E-02	G
EU-155	1.3822E-02						
		86.45	1.382E-02	%(	1.689E-01	5.05E-02	G K
		105.31	4.537E-02	%	1.746E-01	5.24E-02	G
HG-203	-2.0456E-02						
		279.17	-2.046E-02	%(P	5.544E-02	1.65E-02	G K
		72.87	-5.480E-01	%	1.305E+00	3.95E-01	G
		70.83	3.120E-02	&	2.118E+00	6.31E-01	G
		82.50	-1.423E+00	%	2.738E+00	8.32E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	2.5538E-01						
		583.14	2.554E-01	(	5.402E-02	2.72E-02	G
		510.72	4.527E-01	+	1.663E-01	7.24E-02	G
PB-212	5.9811E-01						
		238.63	5.709E-01	(	8.669E-02	3.50E-02	G K
							Energy duplication
		77.11	6.652E-01	@(	3.320E-01	1.06E-01	G
		74.81	7.902E-01	&	6.670E-01	2.07E-01	G
PB-214	3.8711E-01						
		351.99	3.849E-01	(	8.644E-02	3.55E-02	G K
		295.22	3.914E-01	(	1.698E-01	5.91E-02	G
							Energy duplication
		77.11	1.088E+00	+	5.430E-01	1.74E-01	G
		241.92	2.098E-02	%	5.218E-01	1.54E-01	G
BI-212	3.4896E-01						
		727.17	3.490E-01	(	3.828E-01	1.23E-01	G K
		1620.56	6.466E-01	%	1.388E+00	4.23E-01	G
		785.42	5.426E-01	%	1.741E+00	5.10E-01	G
BI-214	4.2594E-01						
		609.32	4.259E-01	(	8.095E-02	4.15E-02	G K
		1764.51	6.729E-01	+	1.746E-01	1.19E-01	G
		1120.28	7.253E-01	+	3.846E-01	1.71E-01	G
RA-224	8.6867E-01						
		241.00	8.687E-01	(	1.099E+00	3.39E-01	G
RA-226	1.1589E+00						
		185.99	1.159E+00	*(	8.905E-01	2.90E-01	G
AC-228	8.5402E-01						
		911.07	7.953E-01	(	1.336E-01	7.83E-02	G K
		968.90	9.174E-01	(	3.774E-01	1.83E-01	G
		338.40	9.038E-01	*(	3.009E-01	1.28E-01	G
TH-227	-9.2245E-02						
		236.00	-9.225E-02	%(	3.729E-01	1.12E-01	G K
		256.25	1.098E-01	%	5.037E-01	1.50E-01	G
PA-234	6.8647E-02						
		98.44	6.865E-02	%(	1.700E-01	5.14E-02	G K
		946.00	3.758E-02	%	1.638E-01	4.65E-02	G
		131.28	5.865E-02	&	1.931E-01	5.81E-02	G
		94.67	-1.326E-01	%	3.207E-01	9.70E-02	G
		883.24	-5.472E-02	&	4.005E-01	1.14E-01	G
		926.70	-4.922E-02	%	4.084E-01	1.15E-01	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26 8.042E-02 &   3.562E-01 1.04E-01 G

TH-234       1.1245E+00
                           63.29 1.031E+00 %(  2.015E+00 6.12E-01 G K
                           92.80 1.246E+00  (  1.572E+00 4.83E-01 G
                           92.38 4.223E-02 &   1.892E+00 5.64E-01 G

AM-241       1.7522E-03
                           59.54 1.752E-03 %(P 2.894E-01 8.61E-02 G
   ( - This peak used in the nuclide activity average.

   * - Peak is too wide, but only one peak in library.
   ! - Peak is part of a multiplet and this area went
       negative during deconvolution.
   ? - Peak is too narrow.
   @ - Peak is too wide at FW25M, but ok at FWHM.
   % - Peak fails sensitivity test.
   $ - Peak identified, but first peak of this nuclide
       failed one or more qualification tests.
   + - Peak activity higher than counting uncertainty range.
   - - Peak activity lower than counting uncertainty range.
   = - Peak outside analysis energy range.
   & - Calculated peak centroid is not close enough to the
       library energy centroid for positive identification.
   P - Peakbackground subtraction
   } - Peak is too close to another for the activity
       to be found directly.

   Nuclide Codes:                      Peak Codes:
   T - Thermal Neutron Activation      G - Gamma Ray
   F - Fast Neutron Activation         X - X-Ray
   I - Fission Product                 P - Positron Decay
   N - Naturally Occurring Isotope     S - Single-Escape
   P - Photon Reaction                 D - Double-Escape
   C - Charged Particle Reaction       K - Key Line
   M - No MDA Calculation              A - Not in Average
   R - Coincidence Corrected           C - Coincidence Peak
   H - Halflife limit exceeded

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
```

***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	1.2126E-01	1.3294E-01	3.4635E-01	3.4643E-01	3.532E-01
K-40		1.1837E+01	1.1837E+01	1.5634E+00	1.7005E+00	
MN-54	#A	7.2895E-03	7.4050E-03	3.3067E-02	3.3070E-02	3.797E-02
CO-57	#B	7.1010E-03	7.2313E-03	4.0257E-02	4.0259E-02	4.412E-02
CO-60	#B	7.1348E-03	7.1530E-03	3.9640E-02	3.9642E-02	5.086E-02

Sr-85	#A	-2.0862E-02	-2.2503E-02	4.7868E-02	4.7885E-02	4.904E-02
Kr-85	#A	-4.8162E+02	-4.8165E+02	1.0245E+03	1.0249E+03	1.132E+03
Y-88	#B	6.2411E-03	6.5352E-03	3.4397E-02	3.4399E-02	4.132E-02
NB-94	#B	6.6405E-03	6.6405E-03	3.1062E-02	3.1065E-02	3.649E-02
Ag-108M	#B	-1.0802E-02	-1.0803E-02	4.7603E-02	4.7607E-02	5.442E-02
CD-109	#A	2.9201E-01	2.9519E-01	1.2498E+00	1.2499E+00	1.372E+00
SN-113	#B	-1.2919E-03	-1.3482E-03	1.2433E+01	1.2433E+01	5.281E-02
SB-125	#F	1.2198E-01	1.2257E-01	1.0755E-01	1.0777E-01	1.182E-01
I-131	#B	7.8196E-03	1.4399E-02	6.7051E-02	6.7055E-02	4.128E-02
CS-134	#B	-1.0668E-02	-1.0738E-02	3.5893E-02	3.5898E-02	4.045E-02
CS-137	#A	8.2203E-03	8.2240E-03	3.6450E-02	3.6453E-02	4.213E-02
CE-139	#A	-1.0132E-03	-1.0500E-03	4.8259E-02	4.8260E-02	4.656E-02
EU-152	#B	2.9783E-02	2.9814E-02	1.1491E-01	1.1492E-01	1.276E-01
EU-154	#B	-2.0265E-02	-2.0297E-02	8.8473E-02	8.8480E-02	9.826E-02
EU-155	#B	1.3785E-02	1.3822E-02	1.5156E-01	1.5156E-01	1.685E-01
HG-203	#B	-1.8410E-02	-2.0456E-02	6.9485E-02	6.9495E-02	4.990E-02
TL-208		2.5538E-01	2.5538E-01	8.1610E-02	8.2876E-02	
PB-212	#	5.9811E-01	5.9811E-01	1.0992E-01	1.1500E-01	8.669E-02
PB-214	#	3.8711E-01	3.8711E-01	1.0273E-01	1.0503E-01	8.644E-02
BI-212	#A	3.4896E-01	3.4896E-01	3.7025E-01	3.7078E-01	3.828E-01
BI-214		4.2594E-01	4.2594E-01	1.2437E-01	1.2668E-01	
RA-224	#A	8.6867E-01	8.6867E-01	1.0169E+00	1.0181E+00	1.099E+00
RA-226	#	1.1589E+00	1.1589E+00	8.7173E-01	8.7418E-01	
AC-228		8.5402E-01	8.5402E-01	2.2521E-01	2.3032E-01	
TH-227	#B	-9.2245E-02	-9.2245E-02	3.3486E-01	3.3490E-01	3.729E-01
PA-234	#B	6.8647E-02	6.8647E-02	1.5415E-01	1.5420E-01	1.700E-01
TH-234	#B	1.1245E+00	1.1245E+00	1.1955E+00	1.1971E+00	2.015E+00
AM-241	#A	1.7521E-03	1.7522E-03	2.5820E-01	2.5820E-01	2.894E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (85.2 to 1999.1 keV) 1.4531385E+01 pCi/gm
Total Decayed Activity (85.2 to 1999.1 keV) 1.4531395E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
VSB

Reviewed by: _____
Supervisor

Laboratory: Yankee Chemistry

Yankee Chemistry Spectrum name: 101_17NOV2004_1445.An1

Sample description
FSS-OOL-05-01-020-B SOIL

Spectrum Filename: C:\My Documents\FSS_ReanalysisArea\101_17NOV2004_1445.An1

Acquisition information
Start time: 17-Nov-2004 14:46:32
Live time: 2000
Real time: 2003
Dead time: 0.13 %
Detector ID: 1

Detector system
Det 101- DSPE-633

Calibration
Filename: D1_1LSa.Clb
Detector 101 1.0 Liter Marinelli Sand

Energy Calibration
Created: 03-Sep-2004 08:50:48
Zero offset: 0.244 keV
Gain: 0.500 keV/channel
Quadratic: -2.493E-08 keV/channel^2

Efficiency Calibration
Created: 03-Sep-2004 08:52:26
Type: Polynomial
Uncertainty: 0.626 %
Coefficients: -0.321775 -5.816463 0.734234
-0.099357 0.006049 -0.000149

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.23keV)
Stop channel: 4000 (1999.11keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 1.8160E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.8160E+03) =
5.5066E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00

```
Systematic error:           1.0000000E+00
Fraction Limit:             0.000%
```

Yankee Chemistry Spectrum name: 101_17NOV2004_1445.An1

Background width: average of five points.
Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	10-Nov-2004 15:15:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	1010K_Background_Det101.Pbc 17-May-2004 16:32:19
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 15 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.0503

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
74.31	159.	21.46	1.00	1.651E-02				
74.31	159.	21.46	1.00	1.651E-02	74.81	9.600	7.431E-01	PB212
77.29	363.	8.94	1.01	1.736E-02	77.11	17.500	8.965E-01	PB212
					77.11	10.700	1.466E+00	PB214
93.00	133.	31.53	1.50	1.989E-02	92.38	2.570	1.938E+00	TH234
					92.80	3.000	1.656E+00	TH234
93.02	134.	31.79	1.50	1.985E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	1.665E+00	TH234
128.72	136.	28.42	1.87	2.110E-02				
186.13	112.	26.01	1.10	1.857E-02	185.99	3.280	1.363E+00	RA226
209.32	118.	26.18	1.35	1.721E-02				
238.73	826.	4.11	1.12	1.557E-02	238.63	43.100	9.157E-01	PB212
241.67	115.	20.17	1.12	1.541E-02	241.00	3.900	1.424E+00	RA224
					241.92	7.470	7.459E-01	PB214
269.93	66.	32.96	0.92	1.402E-02				
295.25	176.	11.75	1.20	1.292E-02	295.22	19.200	5.283E-01	PB214
300.34	66.	25.08	1.44	1.271E-02				
328.21	56.	30.13	1.52	1.169E-02				
338.52	131.	19.39	1.15	1.135E-02	338.40	12.010	7.173E-01	AC228
352.06	306.	8.25	1.11	1.092E-02	351.99	37.100	5.611E-01	PB214
510.65	143.	14.48	1.30	7.591E-03	510.72	22.500	6.231E-01	TL208
583.32	244.	8.19	1.26	6.682E-03	583.14	86.000	3.161E-01	TL208
609.33	206.	9.35	1.53	6.413E-03	609.32	46.090	5.186E-01	BI214
727.51	64.	23.69	1.17	5.441E-03	727.17	11.800	7.357E-01	BI212
795.20	38.	29.20	0.92	5.019E-03				
795.20	38.	29.20	0.92	5.019E-03	795.76	85.400	6.714E-02	CS134

911.02	142.	11.18	1.56	4.447E-03	911.07	29.000	8.218E-01	AC228
968.03	124.	13.39	1.49	4.215E-03	968.90	17.460	1.250E+00	AC228
1120.06	61.	16.95	2.35	3.711E-03	1120.28	15.040	8.107E-01	BI214
1460.78	576.	4.34	1.63	2.942E-03	1460.75	10.700	1.362E+01	K40
1621.11	13.	34.80	0.95	2.682E-03	1620.56	2.750	1.292E+00	BI212
1764.77	39.	17.45	1.74	2.481E-03	1764.51	15.920	7.309E-01	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
148.18	74.72	499.	159.	0.079	64.37	1.004	BI-207	D
154.14	77.70	345.	363.	0.181	26.83	1.007	PB-214	D
257.05	128.72	515.	164.	0.082	63.37	1.867	AC-228	s
418.31	209.32	332.	118.	0.059	78.54	1.348	AC-228	s
477.18	238.72	162.	826.	0.413	12.32	1.122	PB-212	D
539.58	269.93	171.	66.	0.033	98.88	0.921	AC-228	
600.44	300.34	99.	66.	0.033	75.23	1.439	PB-212	s
656.20	328.21	106.	56.	0.028	90.38	1.519	AC-228	s

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-212	149.11	74.77	1038.	188.	0.094	76.03	1.499
PB-212	153.79	77.11	986.	285.	0.143	49.98	1.499D
PB-214	153.79	77.11	986.	285.	0.143	49.98	1.499D
TH-234	185.63	93.02	835.	134.	0.067	95.38	1.499s
TH-234	185.58	93.00	811.	133.	0.066	94.60	1.499s
RA-226	371.92	186.13	459.	110.	0.055	87.21	1.499
PB-212	477.19	238.75	393.	699.	0.350	16.53	1.499
RA-224	481.70	241.00	467.	89.	0.045	107.66	1.123D
PB-214	590.29	295.27	192.	175.	0.087	40.62	1.499
AC-228	676.83	338.52	179.	131.	0.066	58.18	1.149s
PB-214	703.73	351.97	106.	266.	0.133	24.66	1.499
TL-208	1021.24	510.65	84.	143.	0.072	43.43	1.303s
TL-208	1166.66	583.32	58.	244.	0.122	24.58	1.258s
BI-214	1218.70	609.33	57.	206.	0.103	28.06	1.525
BI-212	1455.17	727.51	52.	64.	0.032	71.06	1.172s
CS-134	1589.52	794.65	24.	24.	0.012	105.93	1.502s
AC-228	1822.39	911.02	40.	142.	0.071	33.53	1.560s
AC-228	1936.47	968.03	40.	124.	0.062	40.16	1.494s
BI-214	2240.72	1120.06	16.	61.	0.030	50.84	2.348s
K-40	2922.58	1460.78	11.	576.	0.288	13.03	1.629
BI-212	3243.46	1621.11	2.	13.	0.006	104.40	0.947s
BI-214	3530.97	1764.77	2.	39.	0.019	52.35	1.741s

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

Nuclide Name	Nuclide Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	MDA Value pCi/gm	COMMENTS
BE-7		1.2106E-01					
			477.56	1.211E-01	%(	4.617E-01 1.36E-01	G
K-40		1.3619E+01					
			1460.75	1.362E+01	(	4.260E-01 5.91E-01	G
MN-54		2.2223E-02					
			834.81	2.222E-02	&(	5.751E-02 1.72E-02	G
CO-57		-1.0670E-02					
			122.07	-1.067E-02	%(P	5.192E-02 1.55E-02	G K
			136.43	1.845E-03	&	4.154E-01 1.23E-01	G
CO-60		-1.7100E-02					
			1332.51	-1.710E-02	&(P	6.131E-02 1.46E-02	G K
			1173.23	-1.447E-02	& P	8.556E-02 2.30E-02	G K
Sr-85		-2.2649E-02					
			514.00	-2.265E-02	%(	6.375E-02 1.91E-02	G
Kr-85		-4.8531E+02					
			513.99	-4.853E+02	%(	1.366E+03 4.09E+02	G
Y-88		-1.7717E-03					
			1836.01	-1.772E-03	%(P	5.045E-02 1.25E-02	G K
			898.02	-1.153E-02	% P	5.614E-02 1.59E-02	G
NB-94		1.2499E-02					
			871.10	1.250E-02	%(	4.281E-02 1.25E-02	G K
			702.50	1.695E-02	%	4.798E-02 1.43E-02	G K
Ag-108M		0.0000E+00					
			722.95	0.000E+00	%(	1.044E-01 3.04E-02	G K
			614.37	-2.035E-02	%	5.874E-02 1.75E-02	G
			433.93	-9.905E-04	%	4.451E-02 1.28E-02	G
CD-109		-3.4013E-01					
			88.04	-3.401E-01	%(	1.607E+00 4.83E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SN-113	-8.9078E-03						
		391.71	-8.908E-03	%(P	6.815E-02	1.98E-02	G K
		255.04	3.360E-01	%	1.926E+00	5.71E-01	G
SB-125	-1.5169E-02						
		427.95	-1.517E-02	%(	1.442E-01	4.20E-02	G K
		600.77	-6.498E-02	&	2.253E-01	6.64E-02	G
		636.15	7.709E-02	%	4.402E-01	1.28E-01	G
		463.51	3.242E-01	%	4.425E-01	1.38E-01	G
		176.29	1.350E-01	%	6.481E-01	1.94E-01	G
I-131	1.4067E-02						
		364.48	1.407E-02	%(	8.822E-02	2.59E-02	G K
		636.97	2.820E-03	%	1.099E+00	3.09E-01	G
		284.29	-9.799E-02	%	1.243E+00	3.66E-01	G
CS-134	2.0161E-02						
		604.66	1.265E-03	&(	1.117E-01	3.30E-02	G K
		795.76	4.176E-02	(	4.433E-02	1.47E-02	G
		569.29	1.337E-01	%	2.069E-01	6.48E-02	G
		801.84	4.942E-02	%	4.979E-01	1.40E-01	G
CS-137	1.2904E-02						
		661.62	1.290E-02	%(	5.197E-02	1.52E-02	G
CE-139	-2.9114E-04						
		165.85	-2.911E-04	&(P	5.214E-02	1.54E-02	G
EU-152	-4.6386E-04						
		121.78	-4.639E-04	%(	1.495E-01	4.44E-02	G K
		344.30	-4.215E-03	%	1.469E-01	4.27E-02	G
		1408.08	3.873E-02	%	2.435E-01	6.78E-02	G
		964.00	2.765E-02	&	8.829E-01	2.59E-01	G
		1112.07	1.889E-01	&	3.654E-01	1.12E-01	G
		778.90	-1.167E-02	%	3.276E-01	9.09E-02	G
EU-154	-2.4646E-02						
		123.10	-2.465E-02	%(	1.117E-01	3.35E-02	G K
		1274.80	-2.131E-02	&	1.731E-01	4.87E-02	G
		723.30	-8.520E-02	%	3.315E-01	9.80E-02	G
		1004.80	5.600E-02	%	3.085E-01	8.84E-02	G
EU-155	5.0816E-03						
		86.45	5.082E-03	%(	1.849E-01	5.52E-02	G K
		105.31	6.288E-02	%	2.012E-01	6.06E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
HG-203	-2.9275E-03						
		279.17	-2.927E-03	&(P	5.519E-02	1.60E-02	G K
		72.87	3.532E-02	%	9.831E-01	2.92E-01	G
		70.83	4.953E-02	%	2.904E+00	8.69E-01	G
		82.50	4.259E-02	&	3.024E+00	9.02E-01	G
TL-208	3.1611E-01						
		583.14	3.161E-01	@(	4.937E-02	2.59E-02	G
		510.72	6.231E-01	+	1.979E-01	9.02E-02	G
PB-212	7.7197E-01						
		238.63	7.753E-01	(	1.054E-01	4.27E-02	G K
							Energy duplication
		77.11	7.046E-01	(	3.683E-01	1.17E-01	G
		74.81	8.797E-01	&(	7.162E-01	2.23E-01	G
PB-214	5.0011E-01						
		351.99	4.879E-01	(	9.291E-02	4.01E-02	G K
		295.22	5.237E-01	(	2.019E-01	7.09E-02	G
							Energy duplication
		77.11	1.152E+00	+	6.023E-01	1.92E-01	G
		241.92	2.242E-01	%	7.498E-01	2.25E-01	G
BI-212	8.4077E-01						
		727.17	7.357E-01	(	4.226E-01	1.74E-01	G K
		1620.56	1.292E+00	*(	9.709E-01	4.50E-01	G
		785.42	1.172E+00	%	2.425E+00	7.36E-01	G
BI-214	5.1865E-01						
		609.32	5.186E-01	(	9.540E-02	4.85E-02	G K
		1764.51	7.309E-01	+	1.813E-01	1.28E-01	G
		1120.28	8.107E-01	+	2.862E-01	1.37E-01	G
RA-224	1.1007E+00						
		241.00	1.101E+00	(	1.277E+00	3.95E-01	G
RA-226	1.3465E+00						
		185.99	1.347E+00	(	1.252E+00	3.91E-01	G
AC-228	7.9118E-01						
		911.07	8.218E-01	@(	1.849E-01	9.18E-02	G K
		968.90	1.250E+00	+	3.275E-01	1.67E-01	G
		338.40	7.173E-01	*(	3.548E-01	1.39E-01	G
TH-227	-4.5004E-03						
		236.00	-4.500E-03	%(	4.760E-01	1.41E-01	G K
		256.25	1.407E-01	%	5.018E-01	1.50E-01	G

Yankee Chemistry Spectrum name: 101_17NOV2004_1445.An1

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
PA-234	-3.3828E-02						
		98.44	-3.383E-02	&(	1.905E-01	5.71E-02	G K
		946.00	-1.109E-02	%	2.765E-01	7.74E-02	G
		131.28	-5.302E-02	%	2.332E-01	7.00E-02	G
		94.67	-1.266E-01	%	3.435E-01	1.04E-01	G
		883.24	7.339E-02	&	4.114E-01	1.18E-01	G
		926.70	-1.012E-02	%	4.577E-01	1.27E-01	G
		569.26	1.972E-01	%	3.049E-01	9.54E-02	G
TH-234	1.3981E+00						
		63.29	8.369E-01	%(	2.329E+00	7.03E-01	G K
		92.80	1.656E+00	(	1.688E+00	5.22E-01	G
		92.38	1.948E+00	(	2.003E+00	6.19E-01	G
AM-241	1.2009E-03						
		59.54	1.201E-03	%(P	2.225E-01	6.56E-02	G

(- This peak used in the nuclide activity average.

* - Peak is too wide, but only one peak in library.
! - Peak is part of a multiplet and this area went negative during deconvolution.
? - Peak is too narrow.
@ - Peak is too wide at FW25M, but ok at FWHM.
% - Peak fails sensitivity test.
$ - Peak identified, but first peak of this nuclide failed one or more qualification tests.
+ - Peak activity higher than counting uncertainty range.
- - Peak activity lower than counting uncertainty range.
= - Peak outside analysis energy range.
& - Calculated peak centroid is not close enough to the library energy centroid for positive identification.
P - Peakbackground subtraction
} - Peak is too close to another for the activity to be found directly.

Nuclide Codes:	Peak Codes:
T - Thermal Neutron Activation	G - Gamma Ray
F - Fast Neutron Activation	X - X-Ray
I - Fission Product	P - Positron Decay
N - Naturally Occurring Isotope	S - Single-Escape
P - Photon Reaction	D - Double-Escape
C - Charged Particle Reaction	K - Key Line
M - No MDA Calculation	A - Not in Average
R - Coincidence Corrected	C - Coincidence Peak
H - Halflife limit exceeded	

- -

Yankee Chemistry Spectrum name: 101_17NOV2004_1445.An1

***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	1.1057E-01	1.2106E-01	4.0944E-01	4.0950E-01	4.217E-01
K-40		1.3619E+01	1.3619E+01	1.7739E+00	1.9336E+00	
MN-54	#A	2.1881E-02	2.2223E-02	5.1623E-02	5.1639E-02	5.663E-02
CO-57	#B	-1.0481E-02	-1.0670E-02	5.1693E-02	5.1696E-02	5.100E-02
CO-60	#B	-1.7057E-02	-1.7100E-02	7.1880E-01	7.1880E-01	6.115E-02
Sr-85	#A	-2.1021E-02	-2.2649E-02	5.7333E-02	5.7347E-02	5.916E-02
Kr-85	#A	-4.8529E+02	-4.8531E+02	1.2285E+03	1.2288E+03	1.366E+03
Y-88	#B	-1.6931E-03	-1.7717E-03	1.0067E-01	1.0067E-01	4.821E-02
NB-94	#B	1.2499E-02	1.2499E-02	3.7504E-02	3.7511E-02	4.281E-02
Ag-108M	#B	0.0000E+00	0.0000E+00	9.1333E-02	9.1333E-02	1.044E-01
CD-109	#A	-3.3652E-01	-3.4013E-01	1.4484E+00	1.4485E+00	1.590E+00
SN-113	#B	-8.5411E-03	-8.9078E-03	8.3019E-02	8.3020E-02	6.534E-02
SB-125	#B	-1.5097E-02	-1.5169E-02	1.2589E-01	1.2589E-01	1.435E-01
I-131	#B	7.7067E-03	1.4067E-02	7.7713E-02	7.7717E-02	4.833E-02
CS-134	#B	2.0032E-02	2.0161E-02	2.1357E-02	2.1387E-02	1.110E-01
CS-137	#A	1.2898E-02	1.2904E-02	4.5592E-02	4.5598E-02	5.195E-02
CE-139	#A	-2.8107E-04	-2.9114E-04	7.4693E-02	7.4693E-02	5.033E-02
EU-152	#B	-4.6337E-04	-4.6386E-04	1.3313E-01	1.3313E-01	1.493E-01
EU-154	#B	-2.4607E-02	-2.4646E-02	1.0048E-01	1.0049E-01	1.115E-01
EU-155	#B	5.0680E-03	5.0816E-03	1.6560E-01	1.6560E-01	1.845E-01
HG-203	#B	-2.6387E-03	-2.9275E-03	3.7020E-01	3.7020E-01	4.975E-02
TL-208	#	3.1611E-01	3.1611E-01	7.7693E-02	7.9719E-02	
PB-212	#	7.7197E-01	7.7197E-01	1.2760E-01	1.3485E-01	1.054E-01
PB-214	#	5.0011E-01	5.0011E-01	1.1882E-01	1.2213E-01	9.291E-02
BI-212	#	8.4077E-01	8.4077E-01	5.3089E-01	5.3301E-01	
BI-214		5.1865E-01	5.1865E-01	1.4554E-01	1.4846E-01	
RA-224	A	1.1007E+00	1.1007E+00	1.1850E+00	1.1866E+00	
RA-226	#	1.3465E+00	1.3465E+00	1.1743E+00	1.1767E+00	1.252E+00
AC-228	#	7.9118E-01	7.9118E-01	2.6527E-01	2.6901E-01	
TH-227	#B	-4.5004E-03	-4.5004E-03	4.2311E-01	4.2311E-01	4.760E-01
PA-234	#B	-3.3828E-02	-3.3828E-02	1.7117E-01	1.7118E-01	1.905E-01
TH-234	#B	1.3981E+00	1.3981E+00	1.3226E+00	1.3249E+00	2.329E+00
AM-241	#A	1.2009E-03	1.2009E-03	1.9672E-01	1.9672E-01	2.225E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

Yankee Chemistry Spectrum name: 101_17NOV2004_1445.An1

---------- S U M M A R Y ----------

Total Activity (269.6 to 1999.1 keV) 1.7185980E+01 pCi/gm
Total Decayed Activity (269.6 to 1999.1 keV) 1.7185980E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
VSB

Reviewed by: _____
Supervisor

Laboratory: Yankee Chemistry

Yankee Chemistry Spectrum name: 101F_15NOV2004_1058.An1

Sample description
FSS-OOL-05-01-015-F-S SOIL

Spectrum Filename: C:\My Documents\FSS_ReanalysisArea\101F_15NOV2004_1058.An1

Acquisition information
Start time: 15-Nov-2004 11:00:31
Live time: 2000
Real time: 2003
Dead time: 0.15 %
Detector ID: 1

Detector system
Det 101- DSPE-633

Calibration
Filename: D1_1LSa.Clb
Detector 101 1.0 Liter Marinelli Sand

Energy Calibration
Created: 03-Sep-2004 08:50:48
Zero offset: 0.244 keV
Gain: 0.500 keV/channel
Quadratic: -2.493E-08 keV/channel^2

Efficiency Calibration
Created: 03-Sep-2004 08:52:26
Type: Polynomial
Uncertainty: 0.626 %
Coefficients: -0.321775 -5.816463 0.734234
-0.099357 0.006049 -0.000149

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.23keV)
Stop channel: 4000 (1999.11keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 2.0330E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 2.0330E+03) =
4.9188E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00

```
Systematic error:           1.0000000E+00
Fraction Limit:             0.000%
```

Yankee Chemistry Spectrum name: 101F_15NOV2004_1058.An1

Background width: average of five points.
Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	10-Nov-2004 11:23:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	1010K_Background_Det101.Pbc 17-May-2004 16:32:19
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 18 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.1524

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
74.70	219.	21.89	1.50	1.654E-02	72.87	6.400	1.539E+00	HG203
					74.81	9.600	9.154E-01	PB212
77.03	251.	18.98	1.50	1.720E-02	77.11	17.500	5.542E-01	PB212
					77.11	10.700	9.064E-01	PB214
77.03	251.	18.98	1.50	1.720E-02	77.11	17.500	5.542E-01	PB212
					77.11	10.700	9.064E-01	PB214
84.16	65.	41.50	1.01	1.872E-02				
86.62	98.	29.59	1.01	1.912E-02	86.45	32.740	1.045E-01	EU155
89.98	97.	27.83	1.02	1.957E-02	88.04	3.790	8.878E-01	CD109
93.48	141.	21.07	1.02	1.996E-02	92.38	2.570	1.841E+00	TH234
					92.80	3.000	1.574E+00	TH234
186.01	125.	24.23	1.39	1.858E-02	185.99	3.280	1.361E+00	RA226
209.36	82.	32.46	0.89	1.721E-02				
238.74	743.	4.34	1.12	1.557E-02	238.63	43.100	7.360E-01	PB212
241.67	132.	17.26	1.12	1.541E-02	241.00	3.900	1.458E+00	RA224
270.57	86.	25.96	1.07	1.399E-02				
295.33	168.	11.44	1.16	1.292E-02	295.22	19.200	4.489E-01	PB214
299.91	43.	34.81	1.16	1.273E-02				
338.34	181.	13.64	1.16	1.135E-02	338.40	12.010	8.826E-01	AC228
352.02	298.	8.56	1.07	1.092E-02	351.99	37.100	4.889E-01	PB214
463.11	67.	30.18	0.75	8.349E-03				
463.11	67.	30.18	0.75	8.349E-03	463.51	10.000	5.357E-01	SB125
510.86	116.	19.87	1.45	7.588E-03	510.72	22.500	4.499E-01	TL208
583.20	225.	9.81	1.25	6.684E-03	583.14	86.000	2.597E-01	TL208
609.18	209.	9.16	1.28	6.414E-03	609.32	46.090	4.705E-01	BI214
661.57	89.	21.01	1.10	5.938E-03				

661.57	89.	21.01	1.10	5.938E-03	661.62	84.620	1.180E-01	CS137
727.32	42.	28.99	1.50	5.443E-03	727.17	11.800	4.322E-01	BI212
794.51	37.	37.75	1.35	5.023E-03				
794.51	37.	37.75	1.35	5.023E-03	795.76	85.400	5.830E-02	CS134
911.25	136.	11.20	1.70	4.446E-03	911.07	29.000	7.011E-01	AC228
964.47	25.	36.66	1.61	4.230E-03				
969.20	68.	15.55	1.62	4.211E-03	968.90	17.460	6.149E-01	AC228

Yankee Chemistry Spectrum name: 101F_15NOV2004_1058.An1

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
1120.22	41.	25.01	1.75	3.711E-03	1120.28	15.040	4.931E-01	BI214
1460.75	547.	4.30	1.76	2.942E-03	1460.75	10.700	1.155E+01	K40
1764.54	32.	18.85	1.34	2.481E-03	1764.51	15.920	5.300E-01	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
167.90	84.14	334.	65.	0.033	124.49	1.012	TA-182	lD
172.82	86.60	372.	98.	0.049	88.77	1.013	BI-207	lD
179.54	89.95	316.	97.	0.049	83.48	1.016	PB-214	lD
418.40	209.36	283.	82.	0.041	97.37	0.889	AC-228	
477.18	238.74	148.	743.	0.371	13.02	1.122	PB-212	D
540.86	270.57	181.	86.	0.043	77.88	1.070	AC-228	s
599.46	299.85	134.	61.	0.031	94.33	0.698	TH-227	s
1589.24	794.51	48.	40.	0.020	88.65	1.353	AC-228	s
1929.35	964.19	31.	25.	0.013	109.99	1.613	EU-152	D

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-212	148.96	74.70	1036.	219.	0.109	65.66	1.499
PB-212	153.79	77.11	1010.	251.	0.126	56.95	1.499D
PB-214	153.79	77.11	1010.	251.	0.126	56.95	1.499D
TH-234	185.81	93.12	886.	175.	0.088	75.61	1.499s
TH-234	185.77	93.09	863.	177.	0.089	73.92	1.499s
RA-226	371.60	185.97	446.	113.	0.057	84.00	1.499s
PB-212	477.15	238.72	416.	551.	0.276	20.24	1.499
RA-224	481.70	241.00	435.	102.	0.051	91.23	1.123D
PB-214	590.29	295.27	194.	157.	0.079	44.59	1.499
AC-228	676.47	338.34	153.	181.	0.090	40.92	1.157s
PB-214	703.88	352.04	118.	262.	0.131	25.51	1.499
SB-125	926.22	463.16	99.	42.	0.021	110.18	1.499s
TL-208	1021.66	510.86	114.	116.	0.058	59.60	1.455s
TL-208	1166.41	583.20	81.	225.	0.112	29.42	1.248s
BI-214	1218.39	609.18	61.	209.	0.105	27.48	1.284s
CS-137	1323.72	661.82	49.	51.	0.026	71.95	1.499s
BI-212	1454.80	727.32	52.	42.	0.021	86.98	1.499s

Yankee Chemistry Spectrum name: 101F_15NOV2004_1058.An1

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
AC-228	1822.86	911.25	32.	136.	0.068	33.60	1.702
AC-228	1938.21	968.90	24.	68.	0.034	47.43	1.616D
BI-214	2241.03	1120.22	29.	41.	0.021	75.02	1.747
K-40	2922.51	1460.75	2.	547.	0.273	12.90	1.756
BI-214	3530.51	1764.54	2.	32.	0.016	56.54	1.336s

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	Peak MDA Value pCi/gm	COMMENTS
BE-7		1.3474E-01					
			477.56	1.347E-01	%(	3.578E-01 1.07E-01 G	
K-40		1.1548E+01					
			1460.75	1.155E+01	(	1.963E-01 4.96E-01 G	
MN-54		3.1969E-03					
			834.81	3.197E-03	&(	4.745E-02 1.34E-02 G	
CO-57		-6.2389E-04					
			122.07	-6.239E-04	&(P	4.583E-02 1.36E-02 G K	
			136.43	-9.388E-02	%	3.946E-01 1.18E-01 G	
CO-60		2.0815E-05					
			1332.51	2.082E-05	%(P	5.092E-02 1.27E-02 G K	
			1173.23	1.234E-03	% P	6.034E-02 1.61E-02 G K	
Sr-85		-1.9651E-02					
			514.00	-1.965E-02	&(	5.798E-02 1.74E-02 G	
Kr-85		-4.3012E+02					
			513.99	-4.301E+02	&(	1.269E+03 3.80E+02 G	
Y-88		4.3789E-03					
			1836.01	4.379E-03	%(P	4.562E-02 1.19E-02 G K	
			898.02	-1.060E-02	% P	4.881E-02 1.39E-02 G	
NB-94		6.6878E-03					
			871.10	6.688E-03	%(	4.099E-02 1.17E-02 G K	
			702.50	8.559E-03	&	3.895E-02 1.13E-02 G K	

Yankee Chemistry Spectrum name: 101F_15NOV2004_1058.An1

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
Ag-108M	-1.6211E-02						
		722.95	-1.621E-02	&(	6.595E-02	1.95E-02	G K
		614.37	-2.524E-02	%	5.067E-02	1.54E-02	G
		433.93	1.335E-02	&	4.018E-02	1.20E-02	G
CD-109	1.7721E-02						
		88.04	1.772E-02	&(	1.434E+00	4.28E-01	G
SN-113	-1.0991E-03						
		391.71	-1.099E-03	&(P	5.438E-02	1.55E-02	G K
		255.04	-2.310E-01	%	1.781E+00	5.27E-01	G
SB-125	7.8856E-02						
		427.95	-8.679E-03	%(	1.182E-01	3.41E-02	G K
		600.77	-7.655E-03	%	2.450E-01	7.01E-02	G
		636.15	0.000E+00	%	4.560E-01	1.30E-01	G
		463.51	3.380E-01	(	3.931E-01	1.24E-01	G
		176.29	-1.346E-01	%	5.841E-01	1.75E-01	G
I-131	-1.2676E-03						
		364.48	-1.268E-03	%(	7.444E-02	2.16E-02	G K
		636.97	8.103E-02	&	6.845E-01	1.94E-01	G
		284.29	-1.193E-01	%	7.985E-01	2.35E-01	G
CS-134	0.0000E+00						
		604.66	0.000E+00	&(	1.048E-01	3.09E-02	G K
		795.76	-3.326E-03	%	5.424E-02	1.53E-02	G
		569.29	5.046E-02	%	2.324E-01	6.77E-02	G
		801.84	-5.179E-03	%	5.068E-01	1.41E-01	G
CS-137	6.7514E-02						
		661.62	6.751E-02	*(	4.691E-02	1.62E-02	G
CE-139	6.0243E-03						
		165.85	6.024E-03	&(P	4.460E-02	1.33E-02	G
EU-152	1.4446E-03						
		121.78	1.445E-03	&(	1.375E-01	4.09E-02	G K
		344.30	-6.046E-03	%	1.314E-01	3.82E-02	G
		1408.08	6.564E-03	%	1.612E-01	4.13E-02	G
		964.00	5.911E-02	%	3.689E-01	1.06E-01	G
		1112.07	-2.075E-04	%	4.196E-01	1.17E-01	G
		778.90	7.072E-02	%	2.897E-01	8.40E-02	G
EU-154	-3.4861E-03						
		123.10	-3.486E-03	%(	9.056E-02	2.69E-02	G K
		1274.80	1.609E-02	%	1.448E-01	4.04E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
		723.30	-7.652E-02	&	3.037E-01	8.98E-02	G
		1004.80	3.753E-02	&	2.650E-01	7.51E-02	G
EU-155	1.3607E-02						
		86.45	1.361E-02	%(	1.677E-01	5.02E-02	G K
		105.31	3.381E-02	%	1.983E-01	5.94E-02	G
HG-203	-7.7945E-03						
		279.17	-7.795E-03	%(P	5.022E-02	1.47E-02	G K
		72.87	-5.980E-01	%	1.149E+00	3.49E-01	G
		70.83	-1.383E+00	&	2.240E+00	6.82E-01	G
		82.50	7.181E-01	%	1.951E+00	5.88E-01	G
TL-208	2.5970E-01						
		583.14	2.597E-01	@(	5.175E-02	2.55E-02	G
		510.72	4.499E-01	+	2.045E-01	8.94E-02	G
PB-212	5.4830E-01						
		238.63	5.459E-01	(	9.680E-02	3.68E-02	G K
							Energy duplication
		77.11	5.542E-01	(	3.329E-01	1.05E-01	G
		74.81	9.154E-01	&	6.392E-01	2.00E-01	G
PB-214	4.2725E-01						
		351.99	4.305E-01	(	8.743E-02	3.66E-02	G K
		295.22	4.210E-01	(	1.812E-01	6.26E-02	G
							Energy duplication
		77.11	9.064E-01	+	5.444E-01	1.72E-01	G
		241.92	-3.178E-01	%	6.859E-01	2.08E-01	G
BI-212	4.3217E-01						
		727.17	4.322E-01	*(	3.772E-01	1.25E-01	G K
		1620.56	3.827E-01	%	1.055E+00	3.08E-01	G
		785.42	0.000E+00	&	2.085E+00	5.79E-01	G
BI-214	4.8720E-01						
		609.32	4.705E-01	@(	8.781E-02	4.31E-02	G K
		1764.51	5.300E-01	(	1.416E-01	9.99E-02	G
		1120.28	4.931E-01	(	3.291E-01	1.23E-01	G
RA-224	1.1307E+00						
		241.00	1.131E+00	(	1.102E+00	3.44E-01	G
RA-226	1.2348E+00						
		185.99	1.235E+00	*(	1.103E+00	3.46E-01	G
AC-228	7.1279E-01						
		911.07	7.011E-01	(	1.499E-01	7.85E-02	G K
		968.90	6.155E-01	(	2.304E-01	9.73E-02	G
		338.40	8.826E-01	@(	2.943E-01	1.20E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TH-227	-4.6406E-02						
		236.00	-4.641E-02	%(	3.830E-01	1.14E-01	G K
		256.25	-2.117E-02	%	4.537E-01	1.33E-01	G
PA-234	-4.9526E-02						
		98.44	-4.953E-02	%(	1.630E-01	4.91E-02	G K
		946.00	-7.077E-02	&	3.211E-01	9.40E-02	G
		131.28	-1.447E-02	%	2.133E-01	6.36E-02	G
		94.67	-1.395E-01	%	3.066E-01	9.29E-02	G
		883.24	-2.889E-02	&	4.029E-01	1.14E-01	G
		926.70	3.975E-05	&	4.195E-01	1.16E-01	G
		569.26	9.642E-02	%	3.362E-01	9.90E-02	G
TH-234	1.6069E+00						
		63.29	8.824E-01	%(	2.048E+00	6.20E-01	G K
		92.80	1.972E+00	*(	1.555E+00	4.86E-01	G
		92.38	2.281E+00	*(	1.842E+00	5.75E-01	G
AM-241	1.1952E-01						
		59.54	1.195E-01	&(P	2.494E-01	7.56E-02	G

(- This peak used in the nuclide activity average.

* - Peak is too wide, but only one peak in library.
! - Peak is part of a multiplet and this area went negative during deconvolution.
? - Peak is too narrow.
@ - Peak is too wide at FW25M, but ok at FWHM.
% - Peak fails sensitivity test.
$ - Peak identified, but first peak of this nuclide failed one or more qualification tests.
+ - Peak activity higher than counting uncertainty range.
- - Peak activity lower than counting uncertainty range.
= - Peak outside analysis energy range.
& - Calculated peak centroid is not close enough to the library energy centroid for positive identification.
P - Peakbackground subtraction
} - Peak is too close to another for the activity to be found directly.

Nuclide Codes:	Peak Codes:
T - Thermal Neutron Activation	G - Gamma Ray
F - Fast Neutron Activation	X - X-Ray
I - Fission Product	P - Positron Decay
N - Naturally Occurring Isotope	S - Single-Escape
P - Photon Reaction	D - Double-Escape
C - Charged Particle Reaction	K - Key Line
M - No MDA Calculation	A - Not in Average

R - Coincidence Corrected C - Coincidence Peak
H - Halflife limit exceeded

- -

***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	1.2630E-01	1.3474E-01	3.2123E-01	3.2132E-01	3.354E-01
K-40		1.1548E+01	1.1548E+01	1.4894E+00	1.6261E+00	
MN-54	#A	3.1617E-03	3.1969E-03	4.0250E-02	4.0251E-02	4.693E-02
CO-57	#B	-6.1596E-04	-6.2389E-04	3.4170E-01	3.4170E-01	4.524E-02
CO-60	#B	2.0778E-05	2.0815E-05	3.8010E-02	3.8010E-02	5.083E-02
Sr-85	#A	-1.8631E-02	-1.9651E-02	5.2090E-02	5.2102E-02	5.497E-02
Kr-85	#A	-4.3010E+02	-4.3012E+02	1.1402E+03	1.1404E+03	1.269E+03
Y-88	#B	4.2393E-03	4.3789E-03	3.5763E-02	3.5764E-02	4.416E-02
NB-94	#B	6.6878E-03	6.6878E-03	3.5028E-02	3.5030E-02	4.099E-02
Ag-108M	#B	-1.6210E-02	-1.6211E-02	5.8431E-02	5.8438E-02	6.594E-02
CD-109	#A	1.7587E-02	1.7721E-02	1.2839E+00	1.2839E+00	1.423E+00
SN-113	#B	-1.0666E-03	-1.0991E-03	5.5173E-01	5.5173E-01	5.277E-02
SB-125	#B	7.8587E-02	7.8856E-02	8.6884E-02	8.6999E-02	1.178E-01
I-131	#B	-8.2480E-04	-1.2676E-03	6.4944E-02	6.4944E-02	4.844E-02
CS-134	#B	0.0000E+00	0.0000E+00	9.2781E-02	9.2781E-02	1.043E-01
CS-137	#	6.7493E-02	6.7514E-02	4.8577E-02	4.8727E-02	4.689E-02
CE-139	#A	5.8748E-03	6.0243E-03	3.9830E-02	3.9831E-02	4.349E-02
EU-152	#B	1.4435E-03	1.4446E-03	1.2260E-01	1.2260E-01	1.374E-01
EU-154	#B	-3.4822E-03	-3.4861E-03	8.0684E-02	8.0685E-02	9.046E-02
EU-155	#B	1.3581E-02	1.3607E-02	1.5046E-01	1.5046E-01	1.673E-01
HG-203	#B	-7.2374E-03	-7.7945E-03	1.0837E-01	1.0837E-01	4.663E-02
TL-208	#	2.5970E-01	2.5970E-01	7.6400E-02	7.7796E-02	
PB-212	#	5.4830E-01	5.4830E-01	1.1097E-01	1.1521E-01	9.680E-02
PB-214	#	4.2725E-01	4.2725E-01	1.0901E-01	1.1165E-01	8.743E-02
BI-212	#	4.3217E-01	4.3217E-01	3.7588E-01	3.7667E-01	3.772E-01
BI-214		4.8720E-01	4.8720E-01	1.3390E-01	1.3670E-01	
RA-224		1.1307E+00	1.1307E+00	1.0316E+00	1.0336E+00	
RA-226	#	1.2348E+00	1.2348E+00	1.0372E+00	1.0396E+00	1.103E+00
AC-228		7.1279E-01	7.1279E-01	1.6889E-01	1.7363E-01	
TH-227	#B	-4.6406E-02	-4.6406E-02	3.4174E-01	3.4175E-01	3.830E-01
PA-234	#B	-4.9526E-02	-4.9526E-02	1.4717E-01	1.4719E-01	1.630E-01
TH-234	#B	1.6069E+00	1.6069E+00	1.1878E+00	1.1911E+00	2.048E+00
AM-241	#A	1.1951E-01	1.1952E-01	2.2691E-01	2.2700E-01	2.494E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.

H - Halflife limit exceeded

Yankee Chemistry Spectrum name: 101F_15NOV2004_1058.An1

---------- S U M M A R Y ----------

Total Activity (1120.2 to 1999.1 keV) 1.4138881E+01 pCi/gm
Total Decayed Activity (1120.2 to 1999.1 keV) 1.4138881E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
VSB

Reviewed by: _____
Supervisor

Laboratory: Yankee Chemistry

Yankee Chemistry Spectrum name: 101F_15NOV2004_1304.An1

Sample description
FSS-OOL-05-01-001-F-S SOIL

Spectrum Filename: C:\My Documents\FSS_ReanalysisArea\101F_15NOV2004_1304.An1

Acquisition information

Start time:	15-Nov-2004 13:10:18
Live time:	2000
Real time:	2003
Dead time:	0.13 %
Detector ID:	1

Detector system
Det 101- DSPE-633

Calibration
Filename: D1_1LSa.Clb
Detector 101 1.0 Liter Marinelli Sand

Energy Calibration

Created:	03-Sep-2004 08:50:48
Zero offset:	0.244 keV
Gain:	0.500 keV/channel
Quadratic:	-2.493E-08 keV/channel^2

Efficiency Calibration

Created:	03-Sep-2004 08:52:26
Type:	Polynomial
Uncertainty:	0.626 %
Coefficients:	-0.321775 -5.816463 0.734234
	-0.099357 0.006049 -0.000149

Library Files

Main analysis library:	FSS_Rev_1.Lib
Library Match Width:	1.000
Peak stripping:	Library based

Analysis parameters

Analysis engine:	Env32 G53W4.20
Start channel:	100 (50.23keV)
Stop channel:	4000 (1999.11keV)
Peak rejection level:	41.667%
Peak search sensitivity:	3
Sample Size:	1.7870E+03
Activity scaling factor:	1.0000E+06/(1.0000E+00* 1.7870E+03) = 5.5960E+02
Detection limit method:	Nureg 4.16
Random error:	1.0000000E+00

```
Systematic error:           1.0000000E+00
Fraction Limit:             0.000%
```

Yankee Chemistry Spectrum name: 101F_15NOV2004_1304.An1

Background width: average of five points.
Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	10-Nov-2004 09:25:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	1010K_Background_Det101.Pbc 17-May-2004 16:32:19
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 13 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.0991

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
74.93	137.	29.71	1.50	1.654E-02				
74.93	137.	29.71	1.50	1.654E-02	74.81	9.600	6.510E-01	PB212
77.05	206.	19.12	1.50	1.720E-02	77.11	17.500	5.170E-01	PB212
					77.11	10.700	8.456E-01	PB214
77.05	206.	19.12	1.50	1.720E-02	77.11	17.500	5.170E-01	PB212
					77.11	10.700	8.456E-01	PB214
87.19	78.	31.82	1.01	1.923E-02	86.45	32.740	9.504E-02	EU155
89.86	91.	26.58	1.02	1.958E-02	88.04	3.790	9.519E-01	CD109
93.30	90.	26.62	1.02	1.996E-02	92.38	2.570	1.341E+00	TH234
					92.80	3.000	1.146E+00	TH234
186.06	92.	26.41	1.22	1.858E-02	185.99	3.280	1.136E+00	RA226
238.74	510.	5.22	1.12	1.557E-02	238.63	43.100	5.746E-01	PB212
241.62	89.	20.77	1.12	1.542E-02	241.00	3.900	1.116E+00	RA224
270.11	62.	30.59	1.04	1.401E-02				
295.31	124.	12.50	1.16	1.292E-02	295.22	19.200	3.793E-01	PB214
299.81	38.	36.28	1.16	1.274E-02				
338.39	111.	18.10	1.11	1.135E-02	338.40	12.010	6.180E-01	AC228
351.87	203.	12.42	1.46	1.093E-02				
351.87	203.	12.42	1.46	1.093E-02	351.99	37.100	3.786E-01	PB214
462.96	50.	30.75	0.78	8.351E-03				
462.96	50.	30.75	0.78	8.351E-03	463.51	10.000	4.512E-01	SB125
510.01	97.	18.31	1.98	7.601E-03				
510.01	97.	18.31	1.98	7.601E-03	510.72	22.500	4.308E-01	TL208
583.32	170.	11.63	1.26	6.682E-03	583.14	86.000	2.231E-01	TL208
609.25	132.	11.72	1.30	6.413E-03	609.32	46.090	3.390E-01	BI214
661.65	176.	9.68	1.35	5.937E-03	661.62	84.620	2.650E-01	CS137

727.36	34.	30.22	1.50	5.443E-03	727.17	11.800	3.954E-01	BI212
795.22	17.	39.11	1.50	5.016E-03	795.76	85.400	PBC<MDA	CS134
911.46	98.	13.67	2.22	4.445E-03	911.07	29.000	5.747E-01	AC228
968.44	87.	17.33	1.90	4.214E-03	968.90	17.460	8.946E-01	AC228
1119.94	40.	28.68	1.57	3.711E-03	1120.28	15.040	5.379E-01	BI214

Yankee Chemistry Spectrum name: 101F_15NOV2004_1304.An1

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
1460.83	396.	5.30	1.93	2.942E-03	1460.75	10.700	9.502E+00	K40
1764.71	28.	18.90	1.03	2.481E-03	1764.51	15.920	5.360E-01	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
173.96	87.37	272.	78.	0.039	95.47	1.014	PB-214	lD
179.29	90.04	250.	91.	0.046	79.75	1.016	PB-214	lD
477.17	238.69	100.	510.	0.255	15.67	1.122	PB-212	D
482.94	241.57	126.	89.	0.044	62.31	1.124	PB-214	D
539.94	270.11	123.	62.	0.031	91.78	1.036	AC-228	s
599.22	299.74	108.	41.	0.021	122.13	1.341	TH-227	s
1019.96	510.01	119.	45.	0.022	113.14	1.979	J-133	s

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-212	149.42	74.93	756.	137.	0.068	89.12	1.499s
PB-212	153.79	77.11	671.	206.	0.103	57.35	1.499D
PB-214	153.79	77.11	671.	206.	0.103	57.35	1.499D
TH-234	185.64	93.03	640.	97.	0.048	114.89	1.499s
TH-234	185.59	93.01	601.	103.	0.051	105.60	1.499s
RA-226	371.53	185.94	311.	105.	0.052	77.19	1.499s
PB-212	477.07	238.69	245.	389.	0.195	22.86	1.499
RA-224	483.19	241.74	297.	80.	0.040	97.50	1.499
PB-214	590.14	295.20	154.	89.	0.045	67.03	1.499s
AC-228	676.56	338.39	114.	111.	0.056	54.31	1.105
PB-214	703.77	351.99	102.	177.	0.088	33.09	1.499s
SB-125	926.24	463.17	61.	47.	0.023	83.23	1.499s
TL-208	1022.05	511.06	71.	53.	0.026	79.42	1.499s
TL-208	1166.40	583.20	32.	146.	0.073	29.67	1.499
BI-214	1218.54	609.25	44.	132.	0.066	35.17	1.298
CS-137	1323.39	661.65	38.	176.	0.088	29.03	1.350
BI-212	1454.88	727.36	35.	34.	0.017	90.66	1.499
CS-134	1590.66	795.22	14.	17.	0.009	117.32	1.502
AC-228	1823.27	911.46	24.	98.	0.049	41.02	2.225s
AC-228	1937.29	968.44	39.	87.	0.043	52.00	1.899

Yankee Chemistry Spectrum name: 101F_15NOV2004_1304.An1

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
BI-214	2240.47	1119.94	24.	40.	0.020	86.03	1.572
K-40	2922.67	1460.83	8.	396.	0.198	15.89	1.930
BI-214	3530.85	1764.71	0.	28.	0.014	56.69	1.033s

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	Peak MDA Value pCi/gm	COMMENTS
BE-7		1.0064E-01					
			477.56	1.006E-01	%(	4.109E-01 1.21E-01 G	
K-40		9.5018E+00					
			1460.75	9.502E+00	(	3.895E-01 5.03E-01 G	
MN-54		2.2356E-03					
			834.81	2.236E-03	%(	4.328E-02 1.20E-02 G	
CO-57		6.4831E-03					
			122.07	6.483E-03	&(P	4.423E-02 1.32E-02 G K	
			136.43	-1.433E-03	%	3.738E-01 1.11E-01 G	
CO-60		-1.9696E-03					
			1332.51	-1.970E-03	%(P	5.718E-02 1.40E-02 G K	
			1173.23	-7.881E-03	% P	6.554E-02 1.68E-02 G K	
Sr-85		-1.3678E-02					
			514.00	-1.368E-02	%(	5.361E-02 1.59E-02 G	
Kr-85		-2.9878E+02					
			513.99	-2.988E+02	%(	1.171E+03 3.47E+02 G	
Y-88		-8.1178E-04					
			1836.01	-8.118E-04	%(P	5.518E-02 1.38E-02 G K	
			898.02	-9.152E-03	& P	5.122E-02 1.43E-02 G	
NB-94		-5.3096E-05					
			871.10	-5.310E-05	&(	4.478E-02 1.22E-02 G K	
			702.50	1.142E-02	&	4.194E-02 1.23E-02 G K	
Ag-108M		-1.0873E-02					
			722.95	-1.087E-02	&(	4.883E-02 1.42E-02 G K	
			614.37	-1.613E-02	&	4.421E-02 1.32E-02 G	
			433.93	7.555E-03	%	3.921E-02 1.14E-02 G	

Yankee Chemistry Spectrum name: 101F_15NOV2004_1304.An1

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CD-109	2.2720E-01						
		88.04	2.272E-01	&(	1.342E+00	4.02E-01	G
SN-113	4.3144E-03						
		391.71	4.314E-03	&(P	5.350E-02	1.53E-02	G K
		255.04	-2.372E-02	%	1.708E+00	4.98E-01	G
SB-125	1.1670E-01						
		427.95	1.240E-02	%(	1.080E-01	3.10E-02	G K
		600.77	5.113E-02	&	2.212E-01	6.45E-02	G
		636.15	1.535E-01	%	2.747E-01	8.49E-02	G
		463.51	4.254E-01	(	3.552E-01	1.18E-01	G
		176.29	-6.160E-03	%	5.778E-01	1.70E-01	G
I-131	6.5850E-03						
		364.48	6.585E-03	&(	6.298E-02	1.82E-02	G K
		636.97	3.536E-01	%	6.803E-01	2.08E-01	G
		284.29	2.104E-02	&	7.046E-01	2.03E-01	G
CS-134	1.3049E-02						
		604.66	-2.566E-03	&(	9.832E-02	2.89E-02	G K
		795.76	3.089E-02	(	3.627E-02	1.21E-02	G
		569.29	7.778E-02	&	2.188E-01	6.49E-02	G
		801.84	-2.853E-02	&	4.711E-01	1.31E-01	G
CS-137	2.6499E-01						
		661.62	2.650E-01	(	4.733E-02	2.56E-02	G
CE-139	1.2166E-02						
		165.85	1.217E-02	%(P	4.822E-02	1.44E-02	G
EU-152	-1.3026E-03						
		121.78	-1.303E-03	&(	1.348E-01	3.99E-02	G K
		344.30	1.262E-02	%	1.355E-01	3.95E-02	G
		1408.08	1.012E-02	%	2.056E-01	5.39E-02	G
		964.00	-2.474E-02	%	3.372E-01	9.39E-02	G
		1112.07	-1.210E-01	%	5.024E-01	1.46E-01	G
		778.90	-7.751E-02	%	3.057E-01	8.85E-02	G
EU-154	9.5531E-03						
		123.10	9.553E-03	&(	8.051E-02	2.39E-02	G K
		1274.80	2.136E-03	%	1.468E-01	3.94E-02	G
		723.30	-2.411E-02	%	2.499E-01	7.13E-02	G
		1004.80	1.334E-05	%	2.369E-01	6.32E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
EU-155	8.9085E-02						
		86.45	8.908E-02	&(	1.473E-01	4.49E-02	G K
		105.31	3.099E-02	%	1.814E-01	5.41E-02	G
HG-203	-5.9833E-03						
		279.17	-5.983E-03	&(P	4.664E-02	1.34E-02	G K
		72.87	-5.233E-02	%	1.015E+00	3.02E-01	G
		70.83	5.650E-02	&	2.004E+00	5.96E-01	G
		82.50	-8.464E-01	%	2.437E+00	7.35E-01	G
TL-208	2.0103E-01						
		583.14	1.926E-01	(	3.805E-02	1.91E-02	G
		510.72	2.332E-01	*(	1.857E-01	6.17E-02	G
PB-212	4.6131E-01						
		238.63	4.387E-01	(	8.531E-02	3.34E-02	G K
							Energy duplication
		77.11	5.170E-01	(	3.101E-01	9.88E-02	G
		74.81	6.510E-01	&	6.232E-01	1.93E-01	G
PB-214	3.0993E-01						
		351.99	3.297E-01	@(	9.271E-02	3.64E-02	G K
		295.22	2.717E-01	@(	1.844E-01	6.07E-02	G
							Energy duplication
		77.11	8.456E-01	+	5.072E-01	1.62E-01	G
		241.92	-3.528E-02	%	5.185E-01	1.53E-01	G
BI-212	3.9536E-01						
		727.17	3.954E-01	(	3.551E-01	1.19E-01	G K
		1620.56	-4.490E-02	%	1.837E+00	4.78E-01	G
		785.42	1.087E+00	%	1.592E+00	5.09E-01	G
BI-214	3.3901E-01						
		609.32	3.390E-01	(	8.557E-02	3.97E-02	G K
		1764.51	5.360E-01	+	1.411E-01	1.01E-01	G
		1120.28	5.379E-01	+	3.480E-01	1.54E-01	G
RA-224	1.0019E+00						
		241.00	1.002E+00	(	1.041E+00	3.26E-01	G
RA-226	1.2991E+00						
		185.99	1.299E+00	*(	1.052E+00	3.34E-01	G
AC-228	5.8740E-01						
		911.07	5.747E-01	*(	1.498E-01	7.86E-02	G K
		968.90	8.946E-01	+	3.271E-01	1.55E-01	G
		338.40	6.180E-01	(	2.906E-01	1.12E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TH-227	-1.7312E-01						
		236.00	-1.731E-01	%(	4.020E-01	1.22E-01	G K
		256.25	-5.678E-02	%	5.479E-01	1.61E-01	G
PA-234	-1.2288E-04						
		98.44	-1.229E-04	%(	1.637E-01	4.85E-02	G K
		946.00	-4.326E-02	%	2.517E-01	7.19E-02	G
		131.28	-6.455E-03	%	1.545E-01	4.55E-02	G
		94.67	0.000E+00	%	2.892E-01	8.58E-02	G
		883.24	1.391E-01	&	3.495E-01	1.04E-01	G
		926.70	-4.981E-02	%	4.544E-01	1.28E-01	G
		569.26	1.158E-01	&	3.226E-01	9.58E-02	G
TH-234	1.1566E+00						
		63.29	8.621E-01	%(	2.012E+00	6.09E-01	G K
		92.80	1.300E+00	(	1.482E+00	4.58E-01	G
		92.38	1.436E+00	&(	1.788E+00	5.50E-01	G
AM-241	-5.4132E-03						
		59.54	-5.413E-03	&(P	2.676E-01	7.93E-02	G

(- This peak used in the nuclide activity average.

* - Peak is too wide, but only one peak in library.
! - Peak is part of a multiplet and this area went negative during deconvolution.
? - Peak is too narrow.
@ - Peak is too wide at FW25M, but ok at FWHM.
% - Peak fails sensitivity test.
$ - Peak identified, but first peak of this nuclide failed one or more qualification tests.
\+ - Peak activity higher than counting uncertainty range.
\- - Peak activity lower than counting uncertainty range.
= - Peak outside analysis energy range.
& - Calculated peak centroid is not close enough to the library energy centroid for positive identification.
P - Peakbackground subtraction
} - Peak is too close to another for the activity to be found directly.

Nuclide Codes:	Peak Codes:
T - Thermal Neutron Activation	G - Gamma Ray
F - Fast Neutron Activation	X - X-Ray
I - Fission Product	P - Positron Decay
N - Naturally Occurring Isotope	S - Single-Escape
P - Photon Reaction	D - Double-Escape
C - Charged Particle Reaction	K - Key Line
M - No MDA Calculation	A - Not in Average

R - Coincidence Corrected C - Coincidence Peak
H - Halflife limit exceeded

- -

***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	9.4126E-02	1.0064E-01	3.6251E-01	3.6255E-01	3.843E-01
K-40		9.5018E+00	9.5018E+00	1.5102E+00	1.6028E+00	
MN-54	#A	2.2101E-03	2.2356E-03	3.5927E-02	3.5928E-02	4.279E-02
CO-57	#B	6.3978E-03	6.4831E-03	3.9508E-02	3.9510E-02	4.365E-02
CO-60	#B	-1.9660E-03	-1.9696E-03	5.4335E-02	5.4335E-02	5.708E-02
Sr-85	#A	-1.2944E-02	-1.3678E-02	4.7580E-02	4.7586E-02	5.074E-02
Kr-85	#A	-2.9877E+02	-2.9878E+02	1.0395E+03	1.0397E+03	1.171E+03
Y-88	#B	-7.8501E-04	-8.1178E-04	2.0496E-02	2.0496E-02	5.336E-02
NB-94	#B	-5.3096E-05	-5.3096E-05	3.6748E-02	3.6748E-02	4.478E-02
Ag-108M	#B	-1.0872E-02	-1.0873E-02	4.2490E-02	4.2494E-02	4.883E-02
CD-109	#A	2.2541E-01	2.2720E-01	1.2052E+00	1.2053E+00	1.332E+00
SN-113	#B	4.1825E-03	4.3144E-03	4.6006E-02	4.6007E-02	5.187E-02
SB-125	#F	1.1629E-01	1.1670E-01	9.7129E-02	9.7353E-02	1.076E-01
I-131	#B	4.2217E-03	6.5850E-03	5.4696E-02	5.4698E-02	4.038E-02
CS-134	#B	1.2987E-02	1.3049E-02	1.5309E-02	1.5327E-02	9.785E-02
CS-137		2.6490E-01	2.6499E-01	7.6919E-02	7.8362E-02	
CE-139	#A	1.1854E-02	1.2166E-02	4.3309E-02	4.3315E-02	4.698E-02
EU-152	#B	-1.3016E-03	-1.3026E-03	1.1974E-01	1.1974E-01	1.347E-01
EU-154	#B	9.5421E-03	9.5531E-03	7.1651E-02	7.1653E-02	8.042E-02
EU-155	#B	8.8909E-02	8.9085E-02	1.3473E-01	1.3482E-01	1.470E-01
HG-203	#B	-5.5414E-03	-5.9833E-03	1.7592E-01	1.7593E-01	4.320E-02
TL-208	#	2.0103E-01	2.0103E-01	5.9648E-02	6.0720E-02	3.805E-02
PB-212	#	4.6131E-01	4.6131E-01	1.0545E-01	1.0863E-01	8.531E-02
PB-214	#	3.0993E-01	3.0993E-01	1.0256E-01	1.0405E-01	9.271E-02
BI-212	#	3.9536E-01	3.9536E-01	3.5844E-01	3.5914E-01	3.551E-01
BI-214		3.3901E-01	3.3901E-01	1.1922E-01	1.2075E-01	
RA-224	#A	1.0019E+00	1.0019E+00	9.7682E-01	9.7846E-01	1.041E+00
RA-226	#	1.2991E+00	1.2991E+00	1.0027E+00	1.0054E+00	1.052E+00
AC-228		5.8740E-01	5.8740E-01	1.9991E-01	2.0265E-01	
TH-227	#B	-1.7312E-01	-1.7312E-01	3.6471E-01	3.6484E-01	4.020E-01
PA-234	#B	-1.2288E-04	-1.2288E-04	1.4543E-01	1.4543E-01	1.637E-01
TH-234	#B	1.1566E+00	1.1566E+00	1.0144E+00	1.0164E+00	2.012E+00
AM-241	#A	-5.4130E-03	-5.4132E-03	3.0055E-01	3.0055E-01	2.676E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.

H - Halflife limit exceeded

Yankee Chemistry Spectrum name: 101F_15NOV2004_1304.An1

---------- S U M M A R Y ----------

Total Activity (269.6 to 1999.1 keV) 1.0693101E+01 pCi/gm
Total Decayed Activity (269.6 to 1999.1 keV) 1.0693188E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
VSB

Reviewed by: _____
Supervisor

Laboratory: Yankee Chemistry

Yankee Chemistry Spectrum name: 101F_15NOV2004_1935.An1

Sample description
Detector 101 FSS-OOL-05-01-002-F

Spectrum Filename: C:\My Documents\FSS_ReanalysisArea\101F_15NOV2004_1935.An1

Acquisition information

Start time:	15-Nov-2004 19:28:47
Live time:	2000
Real time:	2002
Dead time:	0.11 %
Detector ID:	1

Detector system
Det 101- DSPE-633

Calibration

Filename:	D1_1LSa.Clb

Detector 101 1.0 Liter Marinelli Sand

Energy Calibration

Created:	03-Sep-2004 08:50:48
Zero offset:	0.244 keV
Gain:	0.500 keV/channel
Quadratic:	-2.493E-08 keV/channel^2

Efficiency Calibration

Created:	03-Sep-2004 08:52:26
Type:	Polynomial
Uncertainty:	0.626 %
Coefficients:	-0.321775 -5.816463 0.734234
	-0.099357 0.006049 -0.000149

Library Files

Main analysis library:	FSS_Rev_1.Lib
Library Match Width:	1.000
Peak stripping:	Library based

Analysis parameters

Analysis engine:	Env32 G53W4.20
Start channel:	100 (50.23keV)
Stop channel:	4000 (1999.11keV)
Peak rejection level:	41.667%
Peak search sensitivity:	3
Sample Size:	1.7000E+03
Activity scaling factor:	1.0000E+06/(1.0000E+00* 1.7000E+03) = 5.8824E+02
Detection limit method:	Nureg 4.16
Random error:	1.0000000E+00

```
Systematic error:           1.0000000E+00
Fraction Limit:             0.000%
```

Yankee Chemistry Spectrum name: 101F_15NOV2004_1935.An1

Background width: average of five points.
Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	10-Nov-2004 12:01:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	1010K_Background_Det101.Pbc 17-May-2004 16:32:19
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 18 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.0550

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
74.79	263.	11.47	1.00	1.654E-02	74.81	9.600	1.318E+00	PB212
77.09	238.	11.61	1.01	1.720E-02	77.11	17.500	8.628E-01	PB212
					77.11	10.700	1.411E+00	PB214
86.58	79.	31.87	1.01	1.914E-02	86.45	32.740	1.009E-01	EU155
90.34	71.	34.98	1.02	1.964E-02				
93.40	136.	19.33	1.02	1.997E-02	92.38	2.570	2.118E+00	TH234
					92.80	3.000	1.810E+00	TH234
185.87	104.	24.37	1.32	1.859E-02	185.99	3.280	1.354E+00	RA226
209.53	74.	36.80	1.25	1.720E-02				
238.69	657.	4.59	1.12	1.557E-02	238.63	43.100	7.784E-01	PB212
241.71	120.	17.62	1.12	1.541E-02	241.00	3.900	1.579E+00	RA224
					241.92	7.470	8.268E-01	PB214
270.47	63.	38.62	0.97	1.399E-02				
294.86	177.	14.09	1.35	1.293E-02	295.22	19.200	5.675E-01	PB214
338.46	168.	14.57	1.12	1.135E-02	338.40	12.010	9.786E-01	AC228
351.93	289.	9.55	0.97	1.093E-02	351.99	37.100	5.668E-01	PB214
462.95	47.	38.94	1.29	8.351E-03				
462.95	47.	38.94	1.29	8.351E-03	463.51	10.000	4.495E-01	SB125
510.95	77.	21.53	1.30	7.587E-03	510.72	22.500	3.575E-01	TL208
583.32	195.	9.88	1.68	6.683E-03	583.14	86.000	2.696E-01	TL208
609.33	169.	10.51	1.31	6.413E-03	609.32	46.090	4.540E-01	BI214
661.50	211.	8.49	1.49	5.938E-03	661.62	84.620	3.344E-01	CS137
727.51	86.	18.88	1.64	5.441E-03	727.17	11.800	1.069E+00	BI212
794.85	21.	38.31	1.50	5.016E-03	795.76	85.400	PBC<MDA	CS134
860.22	35.	28.60	0.99	4.679E-03				
911.10	142.	10.16	1.25	4.446E-03	911.07	29.000	8.729E-01	AC228

968.83	96.	20.30	1.16	4.212E-03	968.90	17.460	1.035E+00	AC228
1120.51	45.	22.24	1.28	3.710E-03	1120.28	15.040	6.352E-01	BI214
1460.61	461.	4.76	1.97	2.943E-03	1460.75	10.700	1.165E+01	K40
1764.14	53.	13.74	2.54	2.481E-03	1764.51	15.920	1.067E+00	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
172.74	86.74	279.	79.	0.040	95.62	1.013	BI-207	lD
180.26	90.50	269.	71.	0.035	104.93	1.016	PB-214	lD
418.73	209.53	267.	74.	0.037	110.39	1.247	AC-228	
540.66	270.47	205.	63.	0.032	115.85	0.972	AC-228	
1720.74	860.22	23.	35.	0.018	85.79	0.985	TL-208	s

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-212	149.19	74.81	324.	263.	0.132	34.42	1.005D
PB-212	153.79	77.11	337.	238.	0.119	34.84	1.006A
TH-234	186.11	93.27	663.	139.	0.070	82.36	1.499s
TH-234	186.08	93.25	672.	151.	0.075	77.02	1.499s
RA-226	371.39	185.87	255.	104.	0.052	73.10	1.319s
PB-212	476.96	238.63	131.	657.	0.329	13.84	1.122D
RA-224	483.36	241.83	446.	96.	0.048	98.49	1.499
PB-214	483.54	241.92	138.	113.	0.056	52.38	1.124D
PB-214	589.46	294.86	165.	177.	0.089	42.26	1.349s
AC-228	676.71	338.46	148.	168.	0.084	43.70	1.125
PB-214	703.65	351.93	135.	289.	0.145	28.65	0.971
SB-125	925.86	462.98	80.	36.	0.018	116.24	1.499s
TL-208	1021.85	510.95	70.	77.	0.038	64.58	1.300s
TL-208	1166.65	583.32	55.	195.	0.097	29.63	1.683s
BI-214	1218.70	609.33	52.	169.	0.084	31.54	1.312
CS-137	1323.09	661.50	36.	211.	0.106	25.48	1.494s
BI-212	1455.17	727.51	49.	86.	0.043	56.65	1.643s
CS-134	1589.93	794.85	23.	21.	0.011	114.93	1.502s
AC-228	1822.54	911.10	23.	142.	0.071	30.49	1.245s
AC-228	1938.07	968.83	67.	96.	0.048	60.89	1.158
BI-214	2241.62	1120.51	23.	45.	0.022	66.73	1.278
K-40	2922.25	1460.61	6.	461.	0.231	14.28	1.972
BI-214	3529.71	1764.14	0.	53.	0.026	41.21	2.536s

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Code	MDA Value pCi/gm	COMMENTS
BE-7		-1.2253E-01					
			477.56	-1.225E-01	%(	4.535E-01 1.34E-01	G
K-40		1.1649E+01					
			1460.75	1.165E+01	(	3.468E-01 5.55E-01	G
MN-54		-7.3922E-03					
			834.81	-7.392E-03	&(	5.108E-02 1.46E-02	G
CO-57		-1.2165E-02					
			122.07	-1.217E-02	%(P	5.325E-02 1.59E-02	G K
			136.43	3.864E-03	%	4.328E-01 1.28E-01	G
CO-60		-1.0042E-03					
			1332.51	-1.004E-03	%(P	6.043E-02 1.49E-02	G K
			1173.23	-1.102E-02	& P	5.730E-02 1.35E-02	G K
Sr-85		-9.4308E-03					
			514.00	-9.431E-03	&(	5.808E-02 1.70E-02	G
Kr-85		-2.0578E+02					
			513.99	-2.058E+02	&(	1.267E+03 3.71E+02	G
Y-88		8.5993E-03					
			1836.01	8.599E-03	%(P	5.074E-02 1.36E-02	G K
			898.02	-1.108E-02	& P	5.897E-02 1.67E-02	G
NB-94		0.0000E+00					
			871.10	0.000E+00	&(	5.134E-02 1.42E-02	G K
			702.50	-3.184E-03	%	4.879E-02 1.38E-02	G K
Ag-108M		-2.2264E-02					
			722.95	-2.226E-02	%(	6.944E-02 2.06E-02	G K
			614.37	-1.171E-02	%	5.308E-02 1.55E-02	G
			433.93	0.000E+00	&	5.703E-02 1.65E-02	G
CD-109		-6.8874E-03					
			88.04	-6.887E-03	%(	1.540E+00 4.58E-01	G
SN-113		2.5477E-04					
			391.71	2.548E-04	%(P	6.142E-02 1.75E-02	G K
			255.04	6.788E-01	%	1.558E+00 4.71E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	1.1089E-01						
		427.95	3.178E-02	%(	1.422E-01	4.19E-02	G K
		600.77	3.561E-02	&	2.412E-01	6.94E-02	G
		636.15	-1.815E-02	%	3.853E-01	1.08E-01	G
		463.51	3.451E-01	*(	4.237E-01	1.34E-01	G
		176.29	-1.395E-01	%	6.393E-01	1.91E-01	G
I-131	-7.7719E-03						
		364.48	-7.772E-03	&(	8.140E-02	2.37E-02	G K
		636.97	3.139E-01	%	8.345E-01	2.49E-01	G
		284.29	1.833E-02	&	9.395E-01	2.73E-01	G
CS-134	1.7117E-02						
		604.66	-2.698E-03	%(	1.127E-01	3.32E-02	G K
		795.76	3.976E-02	(	4.646E-02	1.52E-02	G
		569.29	1.009E-03	&	2.603E-01	7.28E-02	G
		801.84	-6.822E-02	%	5.161E-01	1.46E-01	G
CS-137	3.3442E-01						
		661.62	3.344E-01	@(	4.836E-02	2.84E-02	G
CE-139	-6.5179E-03						
		165.85	-6.518E-03	&(P	5.415E-02	1.61E-02	G
EU-152	-3.2448E-02						
		121.78	-3.245E-02	&(	1.529E-01	4.58E-02	G K
		344.30	4.056E-02	%	1.272E-01	3.79E-02	G
		1408.08	8.127E-02	%	2.048E-01	6.09E-02	G
		964.00	8.832E-02	%	4.884E-01	1.42E-01	G
		1112.07	1.202E-02	&	4.658E-01	1.29E-01	G
		778.90	-2.675E-02	&	3.385E-01	9.46E-02	G
EU-154	-2.0318E-02						
		123.10	-2.032E-02	%(	9.991E-02	2.99E-02	G K
		1274.80	4.672E-02	&	1.687E-01	4.90E-02	G
		723.30	-1.069E-01	%	3.224E-01	9.60E-02	G
		1004.80	-5.624E-02	%	3.526E-01	1.01E-01	G
EU-155	5.8115E-02						
		86.45	5.812E-02	%(	1.717E-01	5.18E-02	G K
		105.31	-2.236E-02	%	1.987E-01	5.92E-02	G
HG-203	-4.0630E-03						
		279.17	-4.063E-03	%(P	5.187E-02	1.49E-02	G K
		72.87	-3.948E-01	%	1.391E+00	4.19E-01	G
		70.83	-1.728E+00	%	2.384E+00	7.29E-01	G
		82.50	8.599E-01	%	1.949E+00	5.90E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	2.6964E-01						
		583.14	2.696E-01	@(	5.154E-02	2.66E-02	G
		510.72	3.575E-01	+	1.943E-01	7.70E-02	G
PB-212	8.0260E-01						
		238.63	7.781E-01	(	6.637E-02	3.59E-02	G K
							Energy duplication
		77.11	6.291E-01	}	2.331E-01	7.31E-02	G
		74.81	1.318E+00	+	4.337E-01	1.51E-01	G
PB-214	5.6705E-01						
		351.99	5.668E-01	(	1.115E-01	5.41E-02	G K
		295.22	5.675E-01	*(	2.004E-01	7.98E-02	G
							Energy duplication
		77.11	1.128E-01	}	5.401E-01	1.46E-01	G
		241.92	7.805E-01	+	3.970E-01	1.36E-01	G
BI-212	1.0693E+00						
		727.17	1.069E+00	*(	4.356E-01	2.02E-01	G K
		1620.56	8.029E-01	%	1.360E+00	4.38E-01	G
		785.42	-7.080E-03	%	2.108E+00	5.76E-01	G
BI-214	4.5399E-01						
		609.32	4.540E-01	(	9.784E-02	4.77E-02	G K
		1764.51	1.067E+00	+	1.483E-01	1.46E-01	G
		1120.28	6.352E-01	+	3.597E-01	1.41E-01	G
RA-224	1.2633E+00						
		241.00	1.263E+00	(	1.335E+00	4.15E-01	G
RA-226	1.3537E+00						
		185.99	1.354E+00	(	1.006E+00	3.30E-01	G
AC-228	9.4315E-01						
		911.07	8.729E-01	@(	1.557E-01	8.87E-02	G K
		968.90	1.035E+00	(	4.422E-01	2.10E-01	G
		338.40	9.786E-01	(	3.466E-01	1.43E-01	G
TH-227	-5.0560E-02						
		236.00	-5.056E-02	%(	4.639E-01	1.38E-01	G K
		256.25	-7.065E-02	&	6.407E-01	1.89E-01	G
PA-234	1.8277E-02						
		98.44	1.828E-02	%(	1.875E-01	5.59E-02	G K
		946.00	-5.222E-02	%	2.802E-01	8.05E-02	G
		131.28	1.924E-02	&	1.980E-01	5.89E-02	G
		94.67	1.903E-02	%	3.318E-01	9.88E-02	G
		883.24	0.000E+00	&	4.331E-01	1.20E-01	G
		926.70	-2.138E-02	%	4.314E-01	1.19E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
		569.26	1.578E-02	&	3.497E-01	9.78E-02	G
TH-234	1.4150E+00						
		63.29	4.617E-01	%(	2.260E+00	6.77E-01	G K
		92.80	2.005E+00	*(	1.645E+00	5.15E-01	G
		92.38	2.173E+00	&(	1.912E+00	5.97E-01	G
AM-241	-1.1626E-02						
		59.54	-1.163E-02	%(P	3.065E-01	9.11E-02	G

(- This peak used in the nuclide activity average.

* - Peak is too wide, but only one peak in library.
! - Peak is part of a multiplet and this area went negative during deconvolution.
? - Peak is too narrow.
@ - Peak is too wide at FW25M, but ok at FWHM.
% - Peak fails sensitivity test.
$ - Peak identified, but first peak of this nuclide failed one or more qualification tests.
+ - Peak activity higher than counting uncertainty range.
- - Peak activity lower than counting uncertainty range.
= - Peak outside analysis energy range.
& - Calculated peak centroid is not close enough to the library energy centroid for positive identification.
P - Peakbackground subtraction
} - Peak is too close to another for the activity to be found directly.

Nuclide Codes:	Peak Codes:
T - Thermal Neutron Activation	G - Gamma Ray
F - Fast Neutron Activation	X - X-Ray
I - Fission Product	P - Positron Decay
N - Naturally Occurring Isotope	S - Single-Escape
P - Photon Reaction	D - Double-Escape
C - Charged Particle Reaction	K - Key Line
M - No MDA Calculation	A - Not in Average
R - Coincidence Corrected	C - Coincidence Peak
H - Halflife limit exceeded	

- -

***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	-1.1437E-01	-1.2253E-01	4.0194E-01	4.0200E-01	4.233E-01
K-40		1.1649E+01	1.1649E+01	1.6641E+00	1.7895E+00	
MN-54	#A	-7.3056E-03	-7.3922E-03	4.3668E-02	4.3670E-02	5.048E-02
CO-57	#B	-1.2001E-02	-1.2165E-02	5.2677E-02	5.2681E-02	5.253E-02
CO-60	#B	-1.0022E-03	-1.0042E-03	5.0661E-02	5.0661E-02	6.031E-02

Sr-85	#A	-8.9103E-03	-9.4308E-03	5.1046E-02	5.1049E-02	5.487E-02
Kr-85	#A	-2.0577E+02	-2.0578E+02	1.1135E+03	1.1135E+03	1.267E+03
Y-88	#B	8.3074E-03	8.5993E-03	4.0729E-02	4.0732E-02	4.902E-02
NB-94	#B	0.0000E+00	0.0000E+00	4.2504E-02	4.2504E-02	5.134E-02
Ag-108M	#B	-2.2262E-02	-2.2264E-02	6.1916E-02	6.1929E-02	6.944E-02
CD-109	#A	-6.8317E-03	-6.8874E-03	1.3750E+00	1.3750E+00	1.527E+00
SN-113	#B	2.4675E-04	2.5477E-04	5.2569E-02	5.2569E-02	5.949E-02
SB-125	#B	1.1049E-01	1.1089E-01	1.2890E-01	1.2906E-01	1.417E-01
I-131	#B	-4.9167E-03	-7.7719E-03	7.1216E-02	7.1217E-02	5.149E-02
CS-134	#B	1.7034E-02	1.7117E-02	1.9672E-02	1.9696E-02	1.122E-01
CS-137	#	3.3431E-01	3.3442E-01	8.5196E-02	8.7266E-02	
CE-139	#A	-6.3458E-03	-6.5179E-03	4.9417E-02	4.9419E-02	5.272E-02
EU-152	#B	-3.2423E-02	-3.2448E-02	1.3740E-01	1.3742E-01	1.528E-01
EU-154	#B	-2.0294E-02	-2.0318E-02	8.9625E-02	8.9632E-02	9.980E-02
EU-155	#B	5.7997E-02	5.8115E-02	1.5530E-01	1.5534E-01	1.713E-01
HG-203	#B	-3.7544E-03	-4.0630E-03	3.4211E+00	3.4211E+00	4.793E-02
TL-208	#	2.6964E-01	2.6964E-01	7.9903E-02	8.1342E-02	
PB-212		8.0260E-01	8.0260E-01	1.1109E-01	1.1999E-01	
PB-214		5.6705E-01	5.6705E-01	1.4475E-01	1.4825E-01	
BI-212	#	1.0693E+00	1.0693E+00	6.0582E-01	6.0883E-01	
BI-214		4.5399E-01	4.5399E-01	1.4319E-01	1.4547E-01	
RA-224	#A	1.2633E+00	1.2633E+00	1.2443E+00	1.2463E+00	1.335E+00
RA-226	#	1.3537E+00	1.3537E+00	9.8959E-01	9.9254E-01	
AC-228		9.4315E-01	9.4315E-01	2.5438E-01	2.5990E-01	
TH-227	#B	-5.0560E-02	-5.0560E-02	4.1366E-01	4.1367E-01	4.639E-01
PA-234	#B	1.8277E-02	1.8277E-02	1.6764E-01	1.6765E-01	1.875E-01
TH-234	#B	1.4150E+00	1.4150E+00	1.0898E+00	1.0926E+00	2.260E+00
AM-241	#A	-1.1626E-02	-1.1626E-02	3.0622E-01	3.0622E-01	3.065E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (270.1 to 1999.1 keV) 1.7443186E+01 pCi/gm
Total Decayed Activity (270.1 to 1999.1 keV) 1.7443306E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
VSB

Reviewed by: _____
Supervisor

Laboratory: Yankee Chemistry

Yankee Chemistry Spectrum name: 101F_16NOV2004_1147.An1

Sample description
FSS-OOL-05-01-011-F- SOIL

Spectrum Filename: C:\My Documents\FSS_ReanalysisArea\101F_16NOV2004_1147.An1

Acquisition information
Start time: 16-Nov-2004 11:48:22
Live time: 2000
Real time: 2003
Dead time: 0.16 %
Detector ID: 1

Detector system
Det 101- DSPE-633

Calibration
Filename: D1_1LSa.Clb
Detector 101 1.0 Liter Marinelli Sand

Energy Calibration
Created: 03-Sep-2004 08:50:48
Zero offset: 0.244 keV
Gain: 0.500 keV/channel
Quadratic: -2.493E-08 keV/channel^2

Efficiency Calibration
Created: 03-Sep-2004 08:52:26
Type: Polynomial
Uncertainty: 0.626 %
Coefficients: -0.321775 -5.816463 0.734234
-0.099357 0.006049 -0.000149

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.23keV)
Stop channel: 4000 (1999.11keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 1.6470E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.6470E+03) =
6.0716E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00

```
Systematic error:           1.0000000E+00
Fraction Limit:             0.000%
```

Yankee Chemistry Spectrum name: 101F_16NOV2004_1147.An1

Background width: average of five points.
Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	10-Nov-2004 10:57:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	1010K_Background_Det101.Pbc 17-May-2004 16:32:19
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 13 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.0940

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
63.48	89.	40.78	0.75	1.132E-02	63.29	3.900	1.680E+00	TH234
74.60	174.	17.18	1.00	1.651E-02				
74.60	174.	17.18	1.00	1.651E-02	74.81	9.600	9.001E-01	PB212
77.13	284.	10.47	1.01	1.724E-02	77.11	17.500	7.745E-01	PB212
					77.11	10.700	1.267E+00	PB214
92.92	125.	30.94	1.50	1.989E-02	92.38	2.570	2.010E+00	TH234
					92.80	3.000	1.718E+00	TH234
92.96	124.	31.66	1.50	1.985E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	1.704E+00	TH234
186.14	167.	20.42	1.01	1.857E-02	185.99	3.280	2.253E+00	RA226
210.46	91.	36.23	0.76	1.715E-02				
238.71	666.	4.54	1.12	1.557E-02	238.63	43.100	8.139E-01	PB212
					241.92	7.470	4.749E+00	PB214
238.77	355.	8.57	1.50	1.540E-02	238.63	43.100	PBC<MDA	PB212
					241.92	7.470	2.535E+00	PB214
242.13	94.	21.79	1.12	1.539E-02				
270.71	86.	26.36	0.85	1.398E-02				
295.23	147.	17.44	1.24	1.292E-02	295.22	19.200	4.872E-01	PB214
328.37	59.	35.59	1.12	1.168E-02				
338.51	146.	16.11	1.28	1.135E-02	338.40	12.010	8.800E-01	AC228
352.03	294.	9.85	1.09	1.092E-02	351.99	37.100	5.960E-01	PB214
511.00	106.	21.06	0.84	7.586E-03	510.72	22.500	5.078E-01	TL208
582.87	217.	8.67	1.22	6.687E-03	583.14	86.000	3.096E-01	TL208
609.29	194.	10.41	1.43	6.413E-03	609.32	46.090	5.374E-01	BI214
661.62	252.	8.13	1.25	5.937E-03	661.62	84.620	4.117E-01	CS137
727.39	42.	24.74	1.26	5.443E-03	727.17	11.800	5.365E-01	BI212

794.13	21.	35.32	1.11	5.025E-03				
910.94	125.	13.69	1.01	4.447E-03	911.07	29.000	7.954E-01	AC228
968.61	110.	16.41	1.17	4.213E-03	968.90	17.460	1.225E+00	AC228
1120.25	70.	20.72	2.47	3.711E-03	1120.28	15.040	1.023E+00	BI214
1460.77	515.	4.46	2.10	2.942E-03	1460.75	10.700	1.342E+01	K40

Yankee Chemistry Spectrum name: 101F_16NOV2004_1147.An1

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
1764.84	27.	19.25	0.80	2.481E-03	1764.51	15.920	5.608E-01	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide
126.53	63.48	517.	89.	0.045	122.34	0.754	PA-234 l
148.77	74.72	361.	174.	0.087	51.55	1.005	BI-207 D
153.82	77.24	301.	284.	0.142	31.41	1.006	PB-214 D
420.59	210.46	367.	91.	0.045	108.69	0.755	TH-227 s
483.97	242.15	161.	94.	0.047	65.37	1.124	PB-214 lD
541.14	270.71	158.	86.	0.043	79.08	0.850	AC-228 s
656.52	328.37	139.	59.	0.029	106.77	1.115	RH-106M s
1588.49	794.13	17.	21.	0.010	105.99	1.108	PA-234

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-212	148.99	74.71	848.	148.	0.074	87.25	1.499
PB-212	153.79	77.11	795.	235.	0.118	54.47	1.499D
PB-214	153.79	77.11	795.	235.	0.118	54.47	1.499D
TH-234	185.50	92.96	708.	124.	0.062	94.98	1.499s
TH-234	185.42	92.92	685.	125.	0.062	92.82	1.499s
RA-226	371.92	186.13	392.	116.	0.058	77.43	1.499s
PB-212	477.26	238.78	294.	472.	0.236	20.70	1.499
RA-224	482.83	241.56	426.	82.	0.041	111.47	1.499s
PB-214	477.25	238.77	286.	355.	0.178	25.71	1.499s
PB-214	590.34	295.30	160.	153.	0.076	42.73	1.499s
AC-228	676.80	338.51	146.	146.	0.073	48.32	1.283
PB-214	703.86	352.03	101.	243.	0.122	26.04	1.499
TL-208	1021.94	511.00	105.	106.	0.053	63.17	0.843s
TL-208	1165.75	582.87	44.	217.	0.108	26.01	1.218
BI-214	1218.62	609.29	64.	194.	0.097	31.23	1.426
CS-137	1323.32	661.62	56.	252.	0.126	24.40	1.251
BI-212	1454.94	727.39	30.	42.	0.021	74.23	1.255s
AC-228	1822.23	910.94	42.	125.	0.062	41.08	1.012s
AC-228	1937.62	968.61	51.	110.	0.055	49.24	1.173
BI-214	2241.10	1120.25	36.	70.	0.035	62.15	2.474s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
K-40	2922.56	1460.77	3.	515.	0.257	13.39	2.103
BI-214	3531.11	1764.84	0.	27.	0.014	57.74	0.799s

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	MDA Value pCi/gm	COMMENTS
BE-7		1.3708E-01					
			477.56	1.371E-01	%(	4.106E-01 1.22E-01 G	
K-40		1.3416E+01					
			1460.75	1.342E+01	(	2.879E-01 5.99E-01 G	
MN-54		5.9994E-03					
			834.81	5.999E-03	&(	5.059E-02 1.43E-02 G	
CO-57		2.6759E-02					
			122.07	2.676E-02	%(P	5.087E-02 1.55E-02 G K	
			136.43	1.971E-02	&	4.402E-01 1.31E-01 G	
CO-60		1.2938E-02					
			1332.51	1.294E-02	%(P	6.297E-02 1.67E-02 G K	
			1173.23	1.232E-02	& P	7.124E-02 1.95E-02 G K	
Sr-85		-1.4743E-02					
			514.00	-1.474E-02	%(	6.553E-02 1.94E-02 G	
Kr-85		-3.1920E+02					
			513.99	-3.192E+02	%(	1.418E+03 4.19E+02 G	
Y-88		3.0903E-03					
			1836.01	3.090E-03	%(P	4.780E-02 1.19E-02 G K	
			898.02	1.743E-02	& P	2.757E-02 8.77E-03 G	
NB-94		-8.0219E-04					
			871.10	-8.022E-04	&(	4.309E-02 1.17E-02 G K	
			702.50	1.134E-02	%	5.367E-02 1.56E-02 G K	
Ag-108M		5.7003E-03					
			722.95	5.700E-03	%(	6.961E-02 2.00E-02 G K	
			614.37	-1.170E-02	%	5.459E-02 1.59E-02 G	
			433.93	3.042E-04	&	4.191E-02 1.19E-02 G	

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CD-109	-1.6850E-01						
		88.04	-1.685E-01	%(	1.659E+00	4.96E-01	G
SN-113	2.4338E-02						
		391.71	2.434E-02	%(P	6.755E-02	2.02E-02	G K
		255.04	4.872E-01	&	2.164E+00	6.44E-01	G
SB-125	-3.2846E-03						
		427.95	-3.285E-03	%(	1.649E-01	4.76E-02	G K
		600.77	3.564E-02	&	1.922E-01	5.49E-02	G
		636.15	1.774E-02	&	4.583E-01	1.30E-01	G
		463.51	2.899E-01	%	4.761E-01	1.46E-01	G
		176.29	-1.638E-01	%	6.858E-01	2.05E-01	G
I-131	1.8665E-02						
		364.48	1.866E-02	&(	7.794E-02	2.30E-02	G K
		636.97	2.847E-02	&	1.136E+00	3.21E-01	G
		284.29	-2.525E-02	&	1.138E+00	3.32E-01	G
CS-134	-5.5725E-03						
		604.66	-5.572E-03	%(	1.197E-01	3.53E-02	G K
		795.76	5.252E-04	&	5.131E-02	1.40E-02	G
		569.29	9.486E-02	%	3.193E-01	9.45E-02	G
		801.84	-1.143E-01	&	6.392E-01	1.84E-01	G
CS-137	4.1169E-01						
		661.62	4.117E-01	(	6.140E-02	3.35E-02	G
CE-139	-6.3395E-03						
		165.85	-6.340E-03	%(P	5.820E-02	1.73E-02	G
EU-152	7.9231E-02						
		121.78	7.923E-02	%(	1.505E-01	4.57E-02	G K
		344.30	-2.819E-02	%	1.747E-01	5.15E-02	G
		1408.08	5.363E-02	%	1.972E-01	5.58E-02	G
		964.00	2.312E-01	%	4.796E-01	1.46E-01	G
		1112.07	-7.478E-02	%	5.223E-01	1.49E-01	G
		778.90	1.245E-01	%	2.903E-01	8.73E-02	G
EU-154	5.7105E-02						
		123.10	5.710E-02	&(	9.990E-02	3.04E-02	G K
		1274.80	2.029E-02	&	2.108E-01	5.94E-02	G
		723.30	1.623E-02	&	4.643E-01	1.35E-01	G
		1004.80	0.000E+00	&	3.885E-01	1.08E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
EU-155	1.4002E-03						
		86.45	1.400E-03	%(	1.873E-01	5.58E-02	G K
		105.31	5.061E-02	%	2.099E-01	6.29E-02	G
HG-203	-2.5720E-03						
		279.17	-2.572E-03	&(P	5.169E-02	1.48E-02	G K
		72.87	-2.539E-01	%	1.391E+00	4.17E-01	G
		70.83	-7.523E-02	&	2.150E+00	6.40E-01	G
		82.50	-6.102E-01	%	2.815E+00	8.44E-01	G
TL-208	3.0958E-01						
		583.14	3.096E-01	(	4.804E-02	2.68E-02	G
		510.72	5.078E-01	+	2.428E-01	1.07E-01	G
PB-212	5.9534E-01						
		238.63	5.767E-01	(	1.009E-01	3.98E-02	G K
							Energy duplication
		77.11	6.413E-01	(	3.654E-01	1.16E-01	G
		74.81	7.629E-01	&	7.152E-01	2.22E-01	G
PB-214	4.9692E-01						
		351.99	4.927E-01	(	1.005E-01	4.28E-02	G K
		295.22	5.051E-01	*(	2.040E-01	7.19E-02	G
							Energy duplication
		77.11	1.049E+00	+	5.977E-01	1.90E-01	G
		241.92	2.535E+00	+	5.815E-01	2.17E-01	G
BI-212	5.3655E-01						
		727.17	5.365E-01	*(	3.607E-01	1.33E-01	G K
		1620.56	4.144E-01	&	1.695E+00	4.74E-01	G
		785.42	0.000E+00	%	2.987E+00	8.40E-01	G
BI-214	5.4344E-01						
		609.32	5.374E-01	(	1.113E-01	5.59E-02	G K
		1764.51	5.608E-01	(	1.531E-01	1.08E-01	G
		1120.28	1.023E+00	+	4.532E-01	2.12E-01	G
RA-224	1.1208E+00						
		241.00	1.121E+00	&(	1.347E+00	4.16E-01	G
RA-226	1.5652E+00						
		185.99	1.565E+00	*(	1.279E+00	4.04E-01	G
AC-228	8.2016E-01						
		911.07	7.954E-01	@(	2.094E-01	1.09E-01	G K
		968.90	1.225E+00	+	4.022E-01	2.01E-01	G
		338.40	8.800E-01	(	3.550E-01	1.42E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TH-227	-1.0227E-01						
		236.00	-1.023E-01	%(	4.736E-01	1.42E-01	G K
		256.25	8.430E-02	&	6.151E-01	1.82E-01	G
PA-234	2.2776E-02						
		98.44	2.278E-02	&(	1.664E-01	4.96E-02	G K
		946.00	0.000E+00	&	4.234E-01	1.21E-01	G
		131.28	2.672E-02	&	2.306E-01	6.88E-02	G
		94.67	-1.376E-01	%	3.561E-01	1.08E-01	G
		883.24	-7.675E-02	%	4.680E-01	1.34E-01	G
		926.70	-7.984E-03	%	4.623E-01	1.27E-01	G
		569.26	1.400E-01	%	4.710E-01	1.39E-01	G
TH-234	1.5869E+00						
		63.29	1.217E+00	%(	2.323E+00	7.06E-01	G K
		92.80	1.718E+00	(	1.715E+00	5.32E-01	G
		92.38	1.994E+00	(	2.038E+00	6.31E-01	G
AM-241	-3.5377E-02						
		59.54	-3.538E-02	&(P	3.248E-01	9.69E-02	G

(- This peak used in the nuclide activity average.

* - Peak is too wide, but only one peak in library.
! - Peak is part of a multiplet and this area went negative during deconvolution.
? - Peak is too narrow.
@ - Peak is too wide at FW25M, but ok at FWHM.
% - Peak fails sensitivity test.
$ - Peak identified, but first peak of this nuclide failed one or more qualification tests.
\+ - Peak activity higher than counting uncertainty range.
\- - Peak activity lower than counting uncertainty range.
= - Peak outside analysis energy range.
& - Calculated peak centroid is not close enough to the library energy centroid for positive identification.
P - Peakbackground subtraction
} - Peak is too close to another for the activity to be found directly.

Nuclide Codes:	Peak Codes:
T - Thermal Neutron Activation	G - Gamma Ray
F - Fast Neutron Activation	X - X-Ray
I - Fission Product	P - Positron Decay
N - Naturally Occurring Isotope	S - Single-Escape
P - Photon Reaction	D - Double-Escape
C - Charged Particle Reaction	K - Key Line
M - No MDA Calculation	A - Not in Average

R - Coincidence Corrected C - Coincidence Peak
H - Halflife limit exceeded

- -

***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	1.2675E-01	1.3708E-01	3.6599E-01	3.6607E-01	3.797E-01
K-40		1.3416E+01	1.3416E+01	1.7969E+00	1.9502E+00	
MN-54	#A	5.9195E-03	5.9994E-03	4.2895E-02	4.2897E-02	4.992E-02
CO-57	#B	2.6348E-02	2.6759E-02	4.6366E-02	4.6390E-02	5.009E-02
CO-60	#B	1.2910E-02	1.2938E-02	5.0109E-02	5.0114E-02	6.283E-02
Sr-85	#A	-1.3822E-02	-1.4743E-02	5.8125E-02	5.8131E-02	6.143E-02
Kr-85	#A	-3.1919E+02	-3.1920E+02	1.2580E+03	1.2581E+03	1.418E+03
Y-88	#B	2.9714E-03	3.0903E-03	3.5673E-02	3.5673E-02	4.596E-02
NB-94	#B	-8.0219E-04	-8.0219E-04	3.5039E-02	3.5039E-02	4.309E-02
Ag-108M	#B	5.6998E-03	5.7003E-03	6.0000E-02	6.0001E-02	6.960E-02
CD-109	#A	-1.6696E-01	-1.6850E-01	1.4883E+00	1.4883E+00	1.644E+00
SN-113	#B	2.3469E-02	2.4338E-02	6.0498E-02	6.0513E-02	6.514E-02
SB-125	#B	-3.2710E-03	-3.2846E-03	1.4282E-01	1.4282E-01	1.642E-01
I-131	#B	1.1093E-02	1.8665E-02	6.8979E-02	6.8987E-02	4.632E-02
CS-134	#B	-5.5416E-03	-5.5725E-03	1.0605E-01	1.0605E-01	1.190E-01
CS-137		4.1153E-01	4.1169E-01	1.0044E-01	1.0310E-01	
CE-139	#A	-6.1496E-03	-6.3395E-03	5.3192E-02	5.3193E-02	5.645E-02
EU-152	#B	7.9160E-02	7.9231E-02	1.3725E-01	1.3732E-01	1.504E-01
EU-154	#B	5.7028E-02	5.7105E-02	9.1327E-02	9.1382E-02	9.977E-02
EU-155	#B	1.3970E-03	1.4002E-03	1.6736E-01	1.6736E-01	1.869E-01
HG-203	#B	-2.3511E-03	-2.5720E-03	1.9152E-01	1.9152E-01	4.725E-02
TL-208		3.0958E-01	3.0958E-01	8.0518E-02	8.2396E-02	
PB-212	#	5.9534E-01	5.9534E-01	1.2321E-01	1.2772E-01	1.009E-01
PB-214	#	4.9692E-01	4.9692E-01	1.2431E-01	1.2744E-01	1.005E-01
BI-212	#	5.3655E-01	5.3655E-01	3.9828E-01	3.9944E-01	
BI-214		5.4344E-01	5.4344E-01	1.6971E-01	1.7246E-01	
RA-224	#A	1.1208E+00	1.1208E+00	1.2494E+00	1.2510E+00	1.347E+00
RA-226	#	1.5651E+00	1.5652E+00	1.2119E+00	1.2151E+00	1.279E+00
AC-228		8.2016E-01	8.2016E-01	2.6008E-01	2.6417E-01	
TH-227	#B	-1.0227E-01	-1.0227E-01	4.2481E-01	4.2485E-01	4.736E-01
PA-234	#B	2.2776E-02	2.2776E-02	1.4866E-01	1.4867E-01	1.664E-01
TH-234	#B	1.5869E+00	1.5869E+00	1.1578E+00	1.1611E+00	2.323E+00
AM-241	#A	-3.5376E-02	-3.5377E-02	3.0204E-01	3.0205E-01	3.248E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.

H - Halflife limit exceeded

Yankee Chemistry Spectrum name: 101F_16NOV2004_1147.An1

---------- S U M M A R Y ----------

Total Activity (84.2 to 1999.1 keV) 1.6037123E+01 pCi/gm
Total Decayed Activity (84.2 to 1999.1 keV) 1.6037279E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
VSB

Reviewed by: _____
Supervisor

Laboratory: Yankee Chemistry

Yankee Chemistry Spectrum name: 101F_16NOV2004_1445.An1

Sample description
FSS-OOL-05-01-011-F- SOIL DUPLICATE COUNT

Spectrum Filename: C:\My Documents\FSS_ReanalysisArea\101F_16NOV2004_1445.An1

Acquisition information

Start time:	16-Nov-2004 14:46:24
Live time:	2000
Real time:	2003
Dead time:	0.15 %
Detector ID:	1

Detector system
Det 101- DSPE-633

Calibration
Filename: D1_1LSa.Clb
Detector 101 1.0 Liter Marinelli Sand

Energy Calibration

Created:	03-Sep-2004 08:50:48
Zero offset:	0.244 keV
Gain:	0.500 keV/channel
Quadratic:	-2.493E-08 keV/channel^2

Efficiency Calibration

Created:	03-Sep-2004 08:52:26
Type:	Polynomial
Uncertainty:	0.626 %
Coefficients:	-0.321775 -5.816463 0.734234
	-0.099357 0.006049 -0.000149

Library Files

Main analysis library:	FSS_Rev_1.Lib
Library Match Width:	1.000
Peak stripping:	Library based

Analysis parameters

Analysis engine:	Env32 G53W4.20
Start channel:	100 (50.23keV)
Stop channel:	4000 (1999.11keV)
Peak rejection level:	41.667%
Peak search sensitivity:	3
Sample Size:	1.6470E+03
Activity scaling factor:	1.0000E+06/(1.0000E+00* 1.6470E+03) = 6.0716E+02
Detection limit method:	Nureg 4.16
Random error:	1.0000000E+00

```
Systematic error:           1.0000000E+00
Fraction Limit:             0.000%
```

Yankee Chemistry Spectrum name: 101F_16NOV2004_1445.An1

Background width: average of five points.
Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	10-Nov-2004 10:57:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	1010K_Background_Det101.Pbc 17-May-2004 16:32:19
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 12 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.1079

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
74.27	114.	26.65	1.00	1.651E-02	72.87	6.400	1.006E+00	HG203
					74.81	9.600	5.881E-01	PB212
77.23	320.	9.37	1.01	1.735E-02	77.11	17.500	8.729E-01	PB212
					77.11	10.700	1.428E+00	PB214
87.29	124.	20.39	1.01	1.926E-02	86.45	32.740	1.627E-01	EU155
89.94	80.	31.93	1.02	1.960E-02	88.04	3.790	9.013E-01	CD109
93.03	119.	21.92	1.02	1.995E-02	92.38	2.570	1.912E+00	TH234
					92.80	3.000	1.634E+00	TH234
185.93	106.	29.51	1.29	1.859E-02				
185.93	106.	29.51	1.29	1.859E-02	185.99	3.280	1.434E+00	RA226
209.29	60.	41.60	1.28	1.722E-02				
238.71	568.	5.09	1.12	1.557E-02	236.00	11.200	2.649E+00	TH227
					238.63	43.100	6.947E-01	PB212
242.19	72.	27.96	1.12	1.539E-02				
270.35	80.	30.61	0.87	1.400E-02				
295.22	157.	12.28	0.95	1.292E-02				
295.22	157.	12.28	0.95	1.292E-02	295.22	19.200	5.186E-01	PB214
338.52	156.	14.99	1.28	1.135E-02	338.40	12.010	9.396E-01	AC228
352.01	285.	9.20	1.14	1.092E-02	351.99	37.100	5.770E-01	PB214
463.26	44.	38.72	0.99	8.346E-03				
463.26	44.	38.72	0.99	8.346E-03	463.51	10.000	4.396E-01	SB125
510.74	70.	25.87	1.96	7.590E-03	510.72	22.500	3.363E-01	TL208
583.02	183.	9.12	1.46	6.686E-03	583.14	86.000	2.616E-01	TL208
609.32	194.	10.90	1.54	6.413E-03	609.32	46.090	5.380E-01	BI214
661.62	277.	8.25	1.37	5.937E-03	661.62	84.620	4.519E-01	CS137
726.52	44.	39.78	0.73	5.447E-03				

795.12	27.	34.61	1.50	5.016E-03	795.76	85.400	PBC<MDA	CS134
910.96	119.	12.80	1.59	4.447E-03	911.07	29.000	7.597E-01	AC228
964.67	24.	41.34	1.61	4.231E-03	964.00	14.580	PBC<MDA	EU152
969.36	63.	16.59	1.86	4.210E-03	968.90	17.460	7.029E-01	AC228
1119.66	60.	21.54	0.98	3.713E-03	1120.28	15.040	8.791E-01	BI214
1460.78	513.	4.55	1.75	2.942E-03	1460.75	10.700	1.336E+01	K40

Yankee Chemistry Spectrum name: 101F_16NOV2004_1445.An1

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
1764.90	39.	16.01	0.77	2.481E-03	1764.51	15.920	8.100E-01	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
148.12	74.72	403.	114.	0.057	79.96	1.004	BI-207	D
154.04	77.68	291.	320.	0.160	28.12	1.007	PB-214	D
174.16	87.56	256.	124.	0.062	61.18	1.014	PB-214	lD
179.46	90.21	284.	80.	0.040	95.80	1.016	PB-214	lD
418.25	209.29	240.	60.	0.030	124.80	1.283	AC-228	
540.43	270.35	190.	80.	0.040	91.83	0.867	AC-228	s
926.42	463.26	94.	44.	0.022	116.17	0.993	SB-125	l
1453.18	726.52	70.	44.	0.022	119.33	0.729	J-132	l

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-212	149.17	74.80	875.	151.	0.075	86.62	1.499
PB-212	153.79	77.11	760.	246.	0.123	51.27	1.499D
PB-214	153.79	77.11	760.	246.	0.123	51.27	1.499D
TH-234	185.68	93.05	691.	131.	0.066	88.83	1.499s
TH-234	185.65	93.04	658.	136.	0.068	83.82	1.499s
RA-226	371.81	186.08	388.	99.	0.050	89.37	1.499
PB-212	477.15	238.73	332.	410.	0.205	24.01	1.499
PB-214	590.19	295.22	134.	130.	0.065	46.10	1.499D
AC-228	676.83	338.52	135.	156.	0.078	44.96	1.278
PB-214	703.66	351.93	112.	259.	0.129	25.46	1.499
TL-208	1021.42	510.74	86.	70.	0.035	77.62	1.960s
TL-208	1166.04	583.02	36.	183.	0.092	27.37	1.458
BI-214	1218.68	609.32	70.	194.	0.097	32.71	1.537s
CS-137	1323.32	661.62	64.	277.	0.138	24.76	1.368
CS-134	1590.46	795.12	30.	27.	0.013	103.83	1.502
AC-228	1822.26	910.96	34.	119.	0.060	38.41	1.587
EU-152	1929.74	964.67	37.	24.	0.012	124.01	1.612s
AC-228	1939.13	969.36	22.	63.	0.032	49.76	1.857
BI-214	2239.91	1119.66	31.	60.	0.030	64.61	0.984s
K-40	2922.58	1460.78	8.	513.	0.256	13.66	1.752

Yankee Chemistry Spectrum name: 101F_16NOV2004_1445.An1

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
BI-214	3531.24	1764.90	0.	39.	0.020	48.04	0.771s

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	MDA Value pCi/gm	COMMENTS
BE-7		1.6997E-01					
			477.56	1.700E-01	%(	3.974E-01 1.20E-01	G
K-40		1.3359E+01					
			1460.75	1.336E+01	(	4.226E-01 6.08E-01	G
MN-54		-2.4236E-03					
			834.81	-2.424E-03	%(	5.527E-02 1.55E-02	G
CO-57		-6.5361E-03					
			122.07	-6.536E-03	&(P	5.419E-02 1.61E-02	G K
			136.43	-3.194E-02	&	4.144E-01 1.23E-01	G
CO-60		5.9382E-03					
			1332.51	5.938E-03	%(P	5.886E-02 1.48E-02	G K
			1173.23	8.246E-03	% P	6.814E-02 1.83E-02	G K
Sr-85		-2.0740E-02					
			514.00	-2.074E-02	&(	6.230E-02 1.86E-02	G
Kr-85		-4.4550E+02					
			513.99	-4.455E+02	&(	1.345E+03 4.02E+02	G
Y-88		-6.6494E-03					
			1836.01	-6.649E-03	%(P	5.260E-02 1.35E-02	G K
			898.02	-3.604E-03	& P	4.441E-02 1.17E-02	G
NB-94		6.1791E-04					
			871.10	6.179E-04	&(	3.827E-02 1.02E-02	G K
			702.50	4.584E-03	%	5.320E-02 1.52E-02	G K
Ag-108M		2.1901E-02					
			722.95	2.190E-02	&(	5.067E-02 1.53E-02	G K
			614.37	-1.433E-02	%	5.423E-02 1.59E-02	G
			433.93	6.165E-03	%	4.804E-02 1.40E-02	G

Yankee Chemistry Spectrum name: 101F_16NOV2004_1445.An1

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CD-109	-9.3306E-02						
		88.04	-9.331E-02	%(	1.550E+00	4.62E-01	G
SN-113	-6.9191E-03						
		391.71	-6.919E-03	&(P	7.002E-02	2.02E-02	G K
		255.04	4.464E-01	&	1.975E+00	5.87E-01	G
SB-125	7.0752E-02						
		427.95	7.075E-02	%(	1.243E-01	3.82E-02	G K
		600.77	1.143E-02	&	1.912E-01	5.31E-02	G
		636.15	1.077E-01	%	3.933E-01	1.15E-01	G
		463.51	3.377E-01	%	4.508E-01	1.41E-01	G
		176.29	4.625E-02	%	7.022E-01	2.08E-01	G
I-131	6.8185E-03						
		364.48	6.818E-03	&(	8.104E-02	2.35E-02	G K
		636.97	3.888E-01	%	8.934E-01	2.69E-01	G
		284.29	8.449E-02	%	1.103E+00	3.23E-01	G
CS-134	2.4914E-02						
		604.66	1.393E-03	%(	1.152E-01	3.39E-02	G K
		795.76	5.179E-02	(	5.427E-02	1.79E-02	G
		569.29	4.103E-02	%	2.109E-01	6.03E-02	G
		801.84	-1.170E-01	%	5.793E-01	1.67E-01	G
CS-137	4.5188E-01						
		661.62	4.519E-01	(	6.552E-02	3.73E-02	G
CE-139	6.4081E-04						
		165.85	6.408E-04	%(P	4.865E-02	1.43E-02	G
EU-152	9.1656E-02						
		121.78	-2.141E-02	&(	1.562E-01	4.66E-02	G K
		344.30	-1.377E-02	&	1.666E-01	4.87E-02	G
		1408.08	3.116E-02	%	2.280E-01	6.20E-02	G
		964.00	3.184E-01	*(	4.130E-01	1.32E-01	G
		1112.07	-8.836E-02	&	5.015E-01	1.44E-01	G
		778.90	-2.775E-03	%	3.709E-01	1.03E-01	G
EU-154	1.6350E-02						
		123.10	1.635E-02	&(	1.095E-01	3.27E-02	G K
		1274.80	7.835E-03	%	1.686E-01	4.60E-02	G
		723.30	9.777E-02	&	2.445E-01	7.32E-02	G
		1004.80	-5.841E-02	&	3.709E-01	1.06E-01	G

Yankee Chemistry Spectrum name: 101F_16NOV2004_1445.An1

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
EU-155	-4.2009E-03						
		86.45	-4.201E-03	&(	1.848E-01	5.50E-02	G K
		105.31	2.666E-02	%	2.072E-01	6.18E-02	G
HG-203	3.4388E-03						
		279.17	3.439E-03	&(P	5.890E-02	1.72E-02	G K
		72.87	-3.621E-01	&	1.401E+00	4.22E-01	G
		70.83	-2.354E-01	&	2.149E+00	6.41E-01	G
		82.50	-6.958E-02	&	3.060E+00	9.11E-01	G
TL-208	2.6162E-01						
		583.14	2.616E-01	(	4.361E-02	2.39E-02	G
		510.72	3.363E-01	+	2.206E-01	8.70E-02	G
PB-212	5.0055E-01						
		238.63	5.005E-01	(	1.071E-01	4.01E-02	G K
							Energy duplication
		77.11	6.702E-01	+	3.575E-01	1.15E-01	G
		74.81	7.802E-01	&	7.262E-01	2.25E-01	G
PB-214	5.2407E-01						
		351.99	5.241E-01	(	1.053E-01	4.45E-02	G K
							Energy duplication
		295.22	4.296E-01	-	1.875E-01	6.60E-02	G
							Energy duplication
		77.11	1.096E+00	+	5.847E-01	1.87E-01	G
		241.92	-1.812E-01	%	7.544E-01	2.26E-01	G
BI-212	2.5410E-01						
		727.17	2.541E-01	%(	4.314E-01	1.33E-01	G K
		1620.56	5.558E-01	%	1.836E+00	5.28E-01	G
		785.42	7.211E-01	%	2.235E+00	6.58E-01	G
BI-214	5.3800E-01						
		609.32	5.380E-01	@(	1.159E-01	5.87E-02	G K
		1764.51	8.100E-01	+	1.531E-01	1.30E-01	G
		1120.28	8.791E-01	+	4.225E-01	1.89E-01	G
RA-224	8.8442E-01						
		241.00	8.844E-01	%(	1.352E+00	4.14E-01	G
RA-226	1.3375E+00						
		185.99	1.338E+00	(	1.273E+00	3.98E-01	G
AC-228	7.7970E-01						
		911.07	7.597E-01	(	1.891E-01	9.73E-02	G K
		968.90	7.029E-01	(	2.741E-01	1.17E-01	G
		338.40	9.396E-01	(	3.421E-01	1.41E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TH-227	-2.4370E-02						
		236.00	-2.437E-02	%(	4.380E-01	1.30E-01	G K
		256.25	1.850E-02	%	5.742E-01	1.68E-01	G
PA-234	-6.8831E-04						
		98.44	-6.883E-04	%(	1.896E-01	5.62E-02	G K
		946.00	1.243E-01	&	2.396E-01	7.34E-02	G
		131.28	4.460E-02	&	2.206E-01	6.60E-02	G
		94.67	-9.332E-02	%	3.464E-01	1.04E-01	G
		883.24	-3.919E-02	%	4.279E-01	1.20E-01	G
		926.70	-1.368E-03	%	4.266E-01	1.16E-01	G
		569.26	2.882E-02	%	3.818E-01	1.08E-01	G
TH-234	1.5230E+00						
		63.29	8.629E-01	%(	2.240E+00	6.77E-01	G K
		92.80	1.875E+00	*(	1.681E+00	5.24E-01	G
		92.38	2.114E+00	*(	2.014E+00	6.26E-01	G
AM-241	-3.9604E-03						
		59.54	-3.960E-03	&(P	3.075E-01	9.12E-02	G

(- This peak used in the nuclide activity average.

* - Peak is too wide, but only one peak in library.
! - Peak is part of a multiplet and this area went negative during deconvolution.
? - Peak is too narrow.
@ - Peak is too wide at FW25M, but ok at FWHM.
% - Peak fails sensitivity test.
$ - Peak identified, but first peak of this nuclide failed one or more qualification tests.
+ - Peak activity higher than counting uncertainty range.
- - Peak activity lower than counting uncertainty range.
= - Peak outside analysis energy range.
& - Calculated peak centroid is not close enough to the library energy centroid for positive identification.
P - Peakbackground subtraction
} - Peak is too close to another for the activity to be found directly.

Nuclide Codes:	Peak Codes:
T - Thermal Neutron Activation	G - Gamma Ray
F - Fast Neutron Activation	X - X-Ray
I - Fission Product	P - Positron Decay
N - Naturally Occurring Isotope	S - Single-Escape
P - Photon Reaction	D - Double-Escape
C - Charged Particle Reaction	K - Key Line
M - No MDA Calculation	A - Not in Average

R - Coincidence Corrected C - Coincidence Peak
H - Halflife limit exceeded

- -

***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	1.5691E-01	1.6997E-01	3.5901E-01	3.5914E-01	3.669E-01
K-40		1.3359E+01	1.3359E+01	1.8244E+00	1.9743E+00	
MN-54	#A	-2.3907E-03	-2.4236E-03	4.6458E-02	4.6458E-02	5.452E-02
CO-57	#B	-6.4336E-03	-6.5361E-03	5.8330E-02	5.8331E-02	5.334E-02
CO-60	#B	5.9251E-03	5.9382E-03	4.4504E-02	4.4505E-02	5.873E-02
Sr-85	#A	-1.9418E-02	-2.0740E-02	5.5824E-02	5.5836E-02	5.833E-02
Kr-85	#A	-4.4548E+02	-4.4550E+02	1.2051E+03	1.2054E+03	1.345E+03
Y-88	#B	-6.3883E-03	-6.6494E-03	5.3144E-02	5.3145E-02	5.053E-02
NB-94	#B	6.1791E-04	6.1791E-04	3.0631E-02	3.0631E-02	3.827E-02
Ag-108M	#B	2.1899E-02	2.1901E-02	4.5760E-02	4.5777E-02	5.066E-02
CD-109	#A	-9.2431E-02	-9.3306E-02	1.3863E+00	1.3863E+00	1.535E+00
SN-113	#B	-6.6672E-03	-6.9191E-03	9.7652E-02	9.7653E-02	6.747E-02
SB-125	#B	7.0455E-02	7.0752E-02	1.1446E-01	1.1453E-01	1.238E-01
I-131	#B	4.0094E-03	6.8185E-03	7.0476E-02	7.0477E-02	4.765E-02
CS-134	#B	2.4773E-02	2.4914E-02	2.5869E-02	2.5908E-02	1.145E-01
CS-137		4.5170E-01	4.5188E-01	1.1190E-01	1.1478E-01	
CE-139	#A	6.2122E-04	6.4081E-04	4.3003E-02	4.3003E-02	4.716E-02
EU-152	#B	9.1572E-02	9.1656E-02	1.1366E-01	1.1377E-01	1.561E-01
EU-154	#B	1.6328E-02	1.6350E-02	9.8048E-02	9.8052E-02	1.094E-01
EU-155	#B	-4.1910E-03	-4.2009E-03	1.6514E-01	1.6514E-01	1.844E-01
HG-203	#B	3.1377E-03	3.4388E-03	5.1578E-02	5.1578E-02	5.375E-02
TL-208		2.6162E-01	2.6162E-01	7.1609E-02	7.3119E-02	
PB-212	#	5.0055E-01	5.0055E-01	1.2018E-01	1.2346E-01	1.071E-01
PB-214	#	5.2407E-01	5.2407E-01	1.3342E-01	1.3667E-01	1.053E-01
BI-212	#B	2.5410E-01	2.5410E-01	3.9962E-01	3.9987E-01	4.314E-01
BI-214		5.3800E-01	5.3800E-01	1.7598E-01	1.7859E-01	
RA-224	#A	8.8442E-01	8.8442E-01	1.2421E+00	1.2431E+00	1.352E+00
RA-226	#	1.3375E+00	1.3375E+00	1.1953E+00	1.1977E+00	1.273E+00
AC-228		7.7970E-01	7.7970E-01	2.0086E-01	2.0563E-01	
TH-227	#B	-2.4370E-02	-2.4370E-02	3.8855E-01	3.8855E-01	4.380E-01
PA-234	#B	-6.8831E-04	-6.8831E-04	1.6873E-01	1.6873E-01	1.896E-01
TH-234	#B	1.5230E+00	1.5230E+00	1.2766E+00	1.2794E+00	2.240E+00
AM-241	#A	-3.9603E-03	-3.9604E-03	3.8794E-01	3.8794E-01	3.075E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.

H - Halflife limit exceeded

Yankee Chemistry Spectrum name: 101F_16NOV2004_1445.An1

---------- S U M M A R Y ----------

Total Activity (83.7 to 1999.1 keV) 1.5389558E+01 pCi/gm
Total Decayed Activity (83.7 to 1999.1 keV) 1.5389733E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
VSB

Reviewed by: _____
Supervisor

Laboratory: Yankee Chemistry

Yankee Chemistry Spectrum name: 101F_16NOV2004_1545.An1

Sample description
FSS-OOL-05-01-006-F- SOIL

Spectrum Filename: C:\My Documents\FSS_ReanalysisArea\101F_16NOV2004_1545.An1

Acquisition information

Start time:	16-Nov-2004 15:41:04
Live time:	2000
Real time:	2003
Dead time:	0.15 %
Detector ID:	1

Detector system
Det 101- DSPE-633

Calibration

Filename:	D1_1LSa.Clb

Detector 101 1.0 Liter Marinelli Sand

Energy Calibration

Created:	03-Sep-2004 08:50:48
Zero offset:	0.244 keV
Gain:	0.500 keV/channel
Quadratic:	-2.493E-08 keV/channel^2

Efficiency Calibration

Created:	03-Sep-2004 08:52:26
Type:	Polynomial
Uncertainty:	0.626 %
Coefficients:	-0.321775 -5.816463 0.734234
	-0.099357 0.006049 -0.000149

Library Files

Main analysis library:	FSS_Rev_1.Lib
Library Match Width:	1.000
Peak stripping:	Library based

Analysis parameters

Analysis engine:	Env32 G53W4.20
Start channel:	100 (50.23keV)
Stop channel:	4000 (1999.11keV)
Peak rejection level:	41.667%
Peak search sensitivity:	3
Sample Size:	1.1050E+03
Activity scaling factor:	1.0000E+06/(1.0000E+00* 1.1050E+03) = 9.0498E+02
Detection limit method:	Nureg 4.16
Random error:	1.0000000E+00

```
Systematic error:           1.0000000E+00
Fraction Limit:             0.000%
```

Yankee Chemistry Spectrum name: 101F_16NOV2004_1545.An1

Background width: average of five points.
Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	10-Nov-2004 15:54:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	1010K_Background_Det101.Pbc 17-May-2004 16:32:19
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 12 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.0671

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
74.64	135.	25.94	1.50	1.654E-02				
74.64	135.	25.94	1.50	1.654E-02	74.81	9.600	1.043E+00	PB212
77.11	194.	18.18	1.50	1.720E-02	77.11	10.700	1.289E+00	PB214
					77.11	17.500	7.879E-01	PB212
77.11	194.	18.18	1.50	1.720E-02	77.11	10.700	1.289E+00	PB214
					77.11	17.500	7.879E-01	PB212
86.61	66.	34.28	1.01	1.910E-02	86.45	32.740	1.289E-01	EU155
89.79	91.	24.10	1.02	1.954E-02	88.04	3.790	1.539E+00	CD109
93.12	98.	22.86	1.02	1.992E-02	92.38	2.570	2.346E+00	TH234
					92.80	3.000	2.005E+00	TH234
128.69	74.	37.53	0.78	2.110E-02				
186.37	110.	23.97	1.28	1.856E-02	185.99	3.280	2.207E+00	RA226
238.72	480.	5.44	1.12	1.557E-02	238.63	43.100	8.742E-01	PB212
242.22	70.	26.10	1.12	1.539E-02	241.00	3.900	1.413E+00	RA224
270.85	79.	23.66	0.88	1.398E-02				
295.33	152.	10.52	1.16	1.292E-02	295.22	19.200	7.477E-01	PB214
300.24	38.	31.94	1.16	1.272E-02				
338.29	116.	15.24	1.12	1.135E-02	338.40	12.010	1.039E+00	AC228
351.91	238.	8.70	1.12	1.093E-02				
351.91	238.	8.70	1.12	1.093E-02	351.99	37.100	7.187E-01	PB214
510.52	80.	22.96	1.38	7.593E-03				
510.52	80.	22.96	1.38	7.593E-03	510.72	22.500	5.693E-01	TL208
583.18	150.	12.35	1.29	6.684E-03	583.14	86.000	3.185E-01	TL208
609.46	166.	11.93	1.20	6.411E-03	609.32	46.090	6.852E-01	BI214
661.74	224.	9.19	1.40	5.936E-03	661.62	84.620	5.454E-01	CS137
726.87	23.	35.56	1.50	5.472E-03	727.17	11.800	4.328E-01	BI212

726.90	25.	33.76	1.50	5.443E-03	727.17	11.800	PBC<MDA	BI212
911.16	68.	16.99	0.78	4.446E-03	911.07	29.000	6.468E-01	AC228
968.21	82.	15.13	2.11	4.215E-03	968.90	17.460	1.364E+00	AC228
1120.58	78.	16.13	0.99	3.711E-03	1120.28	15.040	1.698E+00	BI214
1460.75	407.	5.02	1.91	2.942E-03	1460.75	10.700	1.582E+01	K40

Yankee Chemistry Spectrum name: 101F_16NOV2004_1545.An1

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
1764.65	23.	20.85	2.58	2.481E-03	1764.51	15.920	7.120E-01	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
172.80	86.50	221.	66.	0.033	102.84	1.013	BI-207	lD
179.16	89.68	197.	91.	0.046	72.30	1.016	PB-214	lD
541.43	270.85	104.	79.	0.040	70.98	0.880	AC-228	s
600.26	300.25	77.	38.	0.019	111.56	1.128	PB-212	s

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-212	148.86	74.64	549.	135.	0.068	77.82	1.499
PB-214	153.79	77.11	525.	194.	0.097	54.54	1.499D
PB-212	153.79	77.11	525.	194.	0.097	54.54	1.499D
TH-234	185.34	92.88	486.	116.	0.058	85.24	1.499s
TH-234	185.31	92.86	460.	118.	0.059	81.75	1.499s
RA-226	371.61	185.98	278.	92.	0.046	83.24	1.499
PB-212	477.12	238.71	261.	304.	0.152	28.39	1.499
RA-224	483.25	241.78	295.	66.	0.033	116.45	1.499
PB-214	590.51	295.38	119.	133.	0.067	43.45	1.499
AC-228	676.37	338.29	75.	116.	0.058	45.71	1.125
PB-214	703.67	351.94	74.	220.	0.110	26.08	1.499
TL-208	1021.36	510.71	69.	48.	0.024	85.95	1.499
TL-208	1166.46	583.23	30.	129.	0.065	31.96	1.499
BI-214	1218.96	609.46	62.	166.	0.083	35.79	1.200
CS-137	1323.56	661.74	54.	224.	0.112	27.57	1.405
Ag-108M	1453.90	726.87	21.	23.	0.011	106.68	1.499s
BI-212	1453.95	726.90	24.	25.	0.013	101.28	1.499s
AC-228	1822.67	911.16	23.	68.	0.034	50.98	0.781s
AC-228	1936.84	968.21	24.	82.	0.041	45.40	2.115s
BI-214	2241.75	1120.58	22.	78.	0.039	48.39	0.986s
K-40	2922.51	1460.75	3.	407.	0.204	15.05	1.915
BI-214	3530.74	1764.65	0.	23.	0.012	62.55	2.581s

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Code	MDA Value pCi/gm	COMMENTS
BE-7		2.8453E-02					
			477.56	2.845E-02	%(	5.501E-01 1.55E-01	G
K-40		1.5821E+01					
			1460.75	1.582E+01	(	4.027E-01 7.93E-01	G
MN-54		1.1449E-02					
			834.81	1.145E-02	%(	6.707E-02 1.90E-02	G
CO-57		5.5570E-03					
			122.07	5.557E-03	%(P	6.209E-02 1.84E-02	G K
			136.43	-9.588E-02	%	5.153E-01 1.54E-01	G
CO-60		-6.1029E-03					
			1332.51	-6.103E-03	%(P	9.296E-02 2.26E-02	G K
			1173.23	-1.472E-02	% P	1.042E-01 2.64E-02	G K
Sr-85		-1.4937E-02					
			514.00	-1.494E-02	%(	8.105E-02 2.37E-02	G
Kr-85		-3.2346E+02					
			513.99	-3.235E+02	%(	1.755E+03 5.14E+02	G
Y-88		-1.3200E-03					
			1836.01	-1.320E-03	%(P	1.202E-01 3.18E-02	G K
			898.02	1.226E-02	% P	6.724E-02 1.87E-02	G
NB-94		-1.2083E-02					
			871.10	-1.208E-02	%(	6.393E-02 1.81E-02	G K
			702.50	1.503E-02	&	5.998E-02 1.74E-02	G K
Ag-108M		5.6142E-02					
			722.95	5.614E-02	&(	5.982E-02 2.00E-02	G K
			614.37	-2.978E-02	%	8.369E-02 2.50E-02	G
			433.93	1.110E-02	&	6.552E-02 1.91E-02	G
CD-109		1.8749E-01					
			88.04	1.875E-01	%(	2.053E+00 6.12E-01	G
SN-113		-2.2843E-02					
			391.71	-2.284E-02	%(P	9.471E-02 2.77E-02	G K
			255.04	-3.533E-01	%	2.575E+00 7.57E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	-3.8007E-02						
		427.95	-3.801E-02	%(	2.142E-01	6.26E-02	G K
		600.77	0.000E+00	%	3.572E-01	1.00E-01	G
		636.15	1.004E-01	%	5.550E-01	1.60E-01	G
		463.51	3.581E-01	%	5.246E-01	1.64E-01	G
		176.29	9.350E-02	%	8.492E-01	2.51E-01	G
I-131	2.3006E-02						
		364.48	2.301E-02	%(	9.995E-02	2.93E-02	G K
		636.97	-2.341E-01	%	1.494E+00	4.28E-01	G
		284.29	-2.757E-01	%	1.418E+00	4.18E-01	G
CS-134	-2.0764E-03						
		604.66	-2.076E-03	&(	1.414E-01	4.14E-02	G K
		795.76	3.205E-02	&	7.393E-02	2.22E-02	G
		569.29	1.200E-01	%	3.633E-01	1.07E-01	G
		801.84	1.093E-02	%	6.671E-01	1.80E-01	G
CS-137	5.4544E-01						
		661.62	5.454E-01	(	8.998E-02	5.01E-02	G
CE-139	4.7240E-03						
		165.85	4.724E-03	&(P	6.857E-02	2.02E-02	G
EU-152	1.6637E-02						
		121.78	1.664E-02	%(	1.845E-01	5.47E-02	G K
		344.30	-1.065E-03	%	1.800E-01	5.13E-02	G
		1408.08	6.874E-02	%	3.587E-01	1.00E-01	G
		964.00	-1.531E-01	%	7.334E-01	2.14E-01	G
		1112.07	-2.261E-04	&	5.734E-01	1.54E-01	G
		778.90	3.883E-03	%	3.494E-01	9.13E-02	G
EU-154	-1.6390E-02						
		123.10	-1.639E-02	&(	1.426E-01	4.24E-02	G K
		1274.80	-1.752E-02	%	2.514E-01	6.91E-02	G
		723.30	-8.764E-02	&	4.254E-01	1.24E-01	G
		1004.80	-5.343E-02	%	4.583E-01	1.29E-01	G
EU-155	7.0564E-02						
		86.45	7.056E-02	&(	2.265E-01	6.81E-02	G K
		105.31	5.260E-02	%	2.563E-01	7.65E-02	G
HG-203	1.5618E-02						
		279.17	1.562E-02	%(P	6.457E-02	1.89E-02	G K
		72.87	-7.344E-01	&	1.744E+00	5.28E-01	G
		70.83	-1.391E+00	%	3.095E+00	9.38E-01	G
		82.50	-1.518E+00	%	3.637E+00	1.10E+00	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	2.8843E-01						
		583.14	2.747E-01	(	6.010E-02	2.93E-02	G
		510.72	3.409E-01	(	2.970E-01	9.77E-02	G
PB-212	5.5324E-01						
		238.63	5.532E-01	(	1.421E-01	5.24E-02	G K
							Energy duplication
		77.11	7.879E-01	+	4.447E-01	1.43E-01	G
		74.81	1.043E+00	&	8.622E-01	2.71E-01	G
PB-214	6.6233E-01						
		351.99	6.653E-01	(	1.287E-01	5.78E-02	G K
		295.22	6.565E-01	(	2.644E-01	9.51E-02	G
							Energy duplication
		77.11	1.289E+00	+	7.273E-01	2.34E-01	G
		241.92	9.046E-03	%	8.035E-01	2.35E-01	G
BI-212	4.8342E-01						
		727.17	4.834E-01	(	4.866E-01	1.63E-01	G K
		1620.56	0.000E+00	%	1.222E+00	1.66E-01	G
		785.42	6.098E-01	%	3.687E+00	1.06E+00	G
BI-214	6.9209E-01						
		609.32	6.852E-01	(	1.635E-01	8.18E-02	G K
		1764.51	7.120E-01	(	2.282E-01	1.48E-01	G
		1120.28	1.698E+00	+	5.437E-01	2.74E-01	G
RA-224	1.3395E+00						
		241.00	1.339E+00	&(	1.680E+00	5.20E-01	G
RA-226	1.8401E+00						
		185.99	1.840E+00	(	1.613E+00	5.11E-01	G
AC-228	6.4681E-01						
		911.07	6.468E-01	(	2.367E-01	1.10E-01	G K
		968.90	1.364E+00	+	4.247E-01	2.06E-01	G
		338.40	1.039E+00	+	3.869E-01	1.58E-01	G
TH-227	-2.0889E-01						
		236.00	-2.089E-01	%(	6.219E-01	1.87E-01	G K
		256.25	8.411E-02	&	7.664E-01	2.25E-01	G
PA-234	6.8898E-02						
		98.44	6.890E-02	%(	2.229E-01	6.69E-02	G K
		946.00	1.841E-02	&	3.295E-01	8.98E-02	G
		131.28	-5.085E-02	%	2.276E-01	6.78E-02	G
		94.67	-1.790E-01	%	4.469E-01	1.35E-01	G
		883.24	-1.044E-02	%	4.790E-01	1.28E-01	G
		926.70	1.577E-01	%	5.750E-01	1.66E-01	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26 1.771E-01 %   5.360E-01 1.58E-01 G

TH-234       2.1253E+00
                           63.29 1.463E+00 %(  2.821E+00 8.57E-01 G K
                           92.80 2.423E+00  (  2.104E+00 6.60E-01 G
                           92.38 2.783E+00  (  2.528E+00 7.91E-01 G

AM-241      -1.1377E-03
                           59.54-1.138E-03 &(P 3.518E-01 1.03E-01 G
   ( - This peak used in the nuclide activity average.

   * - Peak is too wide, but only one peak in library.
   ! - Peak is part of a multiplet and this area went
       negative during deconvolution.
   ? - Peak is too narrow.
   @ - Peak is too wide at FW25M, but ok at FWHM.
   % - Peak fails sensitivity test.
   $ - Peak identified, but first peak of this nuclide
       failed one or more qualification tests.
   + - Peak activity higher than counting uncertainty range.
   - - Peak activity lower than counting uncertainty range.
   = - Peak outside analysis energy range.
   & - Calculated peak centroid is not close enough to the
       library energy centroid for positive identification.
   P - Peakbackground subtraction
   } - Peak is too close to another for the activity
       to be found directly.

   Nuclide Codes:                      Peak Codes:
   T - Thermal Neutron Activation      G - Gamma Ray
   F - Fast Neutron Activation         X - X-Ray
   I - Fission Product                 P - Positron Decay
   N - Naturally Occurring Isotope     S - Single-Escape
   P - Photon Reaction                 D - Double-Escape
   C - Charged Particle Reaction       K - Key Line
   M - No MDA Calculation              A - Not in Average
   R - Coincidence Corrected           C - Coincidence Peak
   H - Halflife limit exceeded

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
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***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	2.6324E-02	2.8453E-02	4.6609E-01	4.6609E-01	5.089E-01
K-40		1.5821E+01	1.5821E+01	2.3804E+00	2.5427E+00	
MN-54	#A	1.1298E-02	1.1449E-02	5.7076E-02	5.7080E-02	6.618E-02
CO-57	#B	5.4722E-03	5.5570E-03	5.5096E-02	5.5096E-02	6.114E-02
CO-60	#B	-6.0898E-03	-6.1029E-03	1.1165E-01	1.1165E-01	9.276E-02

Sr-85	#A	-1.4011E-02	-1.4937E-02	7.1163E-02	7.1168E-02	7.603E-02
Kr-85	#A	-3.2345E+02	-3.2346E+02	1.5410E+03	1.5411E+03	1.755E+03
Y-88	#B	-1.2695E-03	-1.3200E-03	4.7130E-02	4.7130E-02	1.156E-01
NB-94	#B	-1.2083E-02	-1.2083E-02	5.4393E-02	5.4397E-02	6.393E-02
Ag-108M	#A	5.6137E-02	5.6142E-02	5.9894E-02	5.9978E-02	5.981E-02
CD-109	#A	1.8578E-01	1.8749E-01	1.8350E+00	1.8350E+00	2.034E+00
SN-113	#B	-2.2033E-02	-2.2843E-02	1.0256E-01	1.0257E-01	9.135E-02
SB-125	#B	-3.7852E-02	-3.8007E-02	1.8791E-01	1.8793E-01	2.133E-01
I-131	#B	1.3725E-02	2.3006E-02	8.7960E-02	8.7969E-02	5.963E-02
CS-134	#B	-2.0649E-03	-2.0764E-03	1.2411E-01	1.2411E-01	1.407E-01
CS-137		5.4523E-01	5.4544E-01	1.5038E-01	1.5351E-01	
CE-139	#A	4.5834E-03	4.7240E-03	6.0730E-02	6.0730E-02	6.653E-02
EU-152	#B	1.6623E-02	1.6637E-02	1.6402E-01	1.6402E-01	1.844E-01
EU-154	#B	-1.6368E-02	-1.6390E-02	1.2712E-01	1.2712E-01	1.424E-01
EU-155	#B	7.0403E-02	7.0564E-02	2.0444E-01	2.0448E-01	2.260E-01
HG-203	#B	1.4286E-02	1.5618E-02	5.6726E-02	5.6732E-02	5.907E-02
TL-208	#	2.8843E-01	2.8843E-01	9.2180E-02	9.3610E-02	6.010E-02
PB-212	#	5.5324E-01	5.5324E-01	1.5706E-01	1.6014E-01	1.421E-01
PB-214	#	6.6233E-01	6.6233E-01	1.6783E-01	1.7195E-01	1.287E-01
BI-212	#A	4.8342E-01	4.8342E-01	4.8962E-01	4.9038E-01	4.866E-01
BI-214		6.9209E-01	6.9209E-01	2.4768E-01	2.5075E-01	
RA-224	#A	1.3395E+00	1.3395E+00	1.5598E+00	1.5616E+00	1.680E+00
RA-226	#	1.8401E+00	1.8401E+00	1.5317E+00	1.5352E+00	1.613E+00
AC-228		6.4681E-01	6.4681E-01	3.2975E-01	3.3177E-01	
TH-227	#B	-2.0889E-01	-2.0889E-01	5.6087E-01	5.6099E-01	6.219E-01
PA-234	#B	6.8898E-02	6.8898E-02	2.0075E-01	2.0079E-01	2.229E-01
TH-234	#B	2.1253E+00	2.1253E+00	1.5007E+00	1.5053E+00	2.821E+00
AM-241	#A	-1.1376E-03	-1.1377E-03	5.7323E+00	5.7323E+00	3.518E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (50.2 to 1999.1 keV) 1.7704834E+01 pCi/gm
Total Decayed Activity (50.2 to 1999.1 keV) 1.7705040E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
VSB

Reviewed by: _____
Supervisor

Laboratory: Yankee Chemistry

Yankee Chemistry Spectrum name: 101F_16NOV2004_1640.An1

Sample description
FSS-OOL-05-01-013-F- SOIL

Spectrum Filename: C:\My Documents\FSS_ReanalysisArea\101F_16NOV2004_1640.An1

Acquisition information

Start time:	16-Nov-2004 16:35:16
Live time:	2000
Real time:	2002
Dead time:	0.11 %
Detector ID:	1

Detector system
Det 101- DSPE-633

Calibration

Filename:	D1_1LSa.Clb

Detector 101 1.0 Liter Marinelli Sand

Energy Calibration

Created:	03-Sep-2004 08:50:48
Zero offset:	0.244 keV
Gain:	0.500 keV/channel
Quadratic:	-2.493E-08 keV/channel^2

Efficiency Calibration

Created:	03-Sep-2004 08:52:26
Type:	Polynomial
Uncertainty:	0.626 %
Coefficients:	-0.321775 -5.816463 0.734234
	-0.099357 0.006049 -0.000149

Library Files

Main analysis library:	FSS_Rev_1.Lib
Library Match Width:	1.000
Peak stripping:	Library based

Analysis parameters

Analysis engine:	Env32 G53W4.20
Start channel:	100 (50.23keV)
Stop channel:	4000 (1999.11keV)
Peak rejection level:	41.667%
Peak search sensitivity:	3
Sample Size:	1.5180E+03
Activity scaling factor:	1.0000E+06/(1.0000E+00* 1.5180E+03) = 6.5876E+02
Detection limit method:	Nureg 4.16
Random error:	1.0000000E+00

```
Systematic error:           1.0000000E+00
Fraction Limit:             0.000%
```

Yankee Chemistry Spectrum name: 101F_16NOV2004_1640.An1

Background width: average of five points.
Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	10-Nov-2004 14:00:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	1010K_Background_Det101.Pbc 17-May-2004 16:32:19
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 18 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.0602

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
74.04	119.	26.52	1.00	1.644E-02				
74.04	119.	26.52	1.00	1.644E-02	74.81	9.600	6.650E-01	PB212
77.28	361.	9.08	1.01	1.736E-02	77.11	10.700	1.744E+00	PB214
					77.11	17.500	1.066E+00	PB212
84.64	60.	40.08	1.00	1.881E-02				
86.74	109.	25.12	1.01	1.912E-02	86.45	32.740	1.562E-01	EU155
89.83	104.	26.93	1.02	1.954E-02	88.04	3.790	1.274E+00	CD109
93.47	109.	25.99	1.02	1.995E-02	92.38	2.570	1.898E+00	TH234
					92.80	3.000	1.623E+00	TH234
186.16	107.	24.26	1.02	1.857E-02	185.99	3.280	1.567E+00	RA226
209.11	94.	33.59	0.98	1.723E-02				
238.68	792.	4.10	1.12	1.557E-02	238.63	43.100	1.051E+00	PB212
241.83	104.	21.46	1.12	1.541E-02	241.00	3.900	1.534E+00	RA224
					241.92	7.470	8.032E-01	PB214
270.28	93.	23.84	1.35	1.400E-02				
295.36	141.	12.55	1.16	1.291E-02	295.22	19.200	5.058E-01	PB214
300.05	71.	21.17	1.16	1.273E-02				
327.68	60.	35.12	1.06	1.171E-02				
338.50	172.	14.65	1.21	1.135E-02	338.40	12.010	1.123E+00	AC228
352.01	282.	10.39	1.24	1.092E-02	351.99	37.100	6.198E-01	PB214
463.07	63.	28.40	1.13	8.349E-03				
463.07	63.	28.40	1.13	8.349E-03	463.51	10.000	6.709E-01	SB125
510.76	108.	14.73	2.12	7.590E-03	510.72	22.500	5.619E-01	TL208
583.16	232.	9.55	1.20	6.684E-03	583.14	86.000	3.590E-01	TL208
609.20	192.	9.83	1.52	6.414E-03	609.32	46.090	5.768E-01	BI214
661.59	181.	13.11	1.39	5.938E-03	661.62	84.620	3.212E-01	CS137

727.22	71.	24.58	1.83	5.443E-03	727.17	11.800	9.896E-01	BI212
794.92	28.	32.94	1.50	5.016E-03	795.76	85.400	5.791E-02	CS134
910.93	159.	10.18	1.79	4.447E-03	911.07	29.000	1.100E+00	AC228
967.75	103.	12.78	1.49	4.217E-03	968.90	17.460	1.247E+00	AC228
1121.08	42.	27.38	1.69	3.711E-03	1120.28	15.040	6.635E-01	BI214
1460.67	578.	4.34	1.91	2.943E-03	1460.75	10.700	1.634E+01	K40

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
1764.62	29.	18.57	1.06	2.481E-03	1764.51	15.920	6.535E-01	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
173.05	86.62	324.	109.	0.055	75.37	1.013	BI-207	lD
179.24	89.71	339.	104.	0.052	80.79	1.016	PB-214	lD
417.89	209.11	349.	94.	0.047	100.76	0.976	AC-228	s
477.08	238.65	131.	792.	0.396	12.30	1.122	PB-212	D
540.28	270.28	165.	93.	0.046	71.51	1.349	AC-228	s
599.85	300.05	99.	64.	0.032	75.87	0.938	PB-212	
655.13	327.68	149.	60.	0.030	105.37	1.055	AC-228	s

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-212	148.88	74.66	924.	187.	0.093	72.44	1.499s
PB-214	153.79	77.11	871.	282.	0.141	47.93	1.499D
PB-212	153.79	77.11	871.	282.	0.141	47.93	1.499D
TH-234	185.48	92.95	773.	160.	0.080	77.42	1.499s
TH-234	185.43	92.92	755.	160.	0.080	76.75	1.499s
RA-226	371.97	186.16	272.	107.	0.054	72.79	1.019
PB-212	477.02	238.66	355.	620.	0.310	17.66	1.499
RA-224	481.70	241.00	384.	101.	0.051	87.37	1.123D
PB-214	590.44	295.35	175.	149.	0.075	44.88	1.499
AC-228	676.77	338.50	149.	172.	0.086	43.95	1.213s
PB-214	703.82	352.01	125.	247.	0.123	27.10	1.499
SB-125	926.05	463.08	81.	40.	0.020	105.58	1.499
TL-208	1021.47	510.76	60.	108.	0.054	44.20	2.122s
TL-208	1166.34	583.16	78.	232.	0.116	28.64	1.199
BI-214	1218.43	609.20	52.	192.	0.096	29.49	1.520s
CS-137	1323.26	661.59	101.	181.	0.091	39.33	1.390s
BI-212	1454.60	727.22	70.	71.	0.036	73.74	1.829s
CS-134	1590.06	794.92	28.	28.	0.014	98.81	1.502s
AC-228	1822.21	910.93	34.	159.	0.080	30.55	1.789s
AC-228	1935.91	967.75	22.	103.	0.052	38.35	1.486s
BI-214	2242.75	1121.08	30.	42.	0.021	82.15	1.694s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
K-40	2922.35	1460.67	11.	578.	0.289	13.03	1.911
BI-214	3530.68	1764.62	0.	29.	0.014	55.71	1.062s

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	MDA Value pCi/gm	COMMENTS
BE-7		2.1735E-02					
			477.56	2.174E-02	%(	4.733E-01 1.35E-01	G
K-40		1.6340E+01					
			1460.75	1.634E+01	(	5.156E-01 7.10E-01	G
MN-54		-1.5494E-02					
			834.81	-1.549E-02	%(	5.729E-02 1.67E-02	G
CO-57		-1.1130E-02					
			122.07	-1.113E-02	&(P	5.793E-02 1.73E-02	G K
			136.43	-3.077E-02	%	4.805E-01 1.43E-01	G
CO-60		-4.6541E-03					
			1332.51	-4.654E-03	&(P	7.838E-02 2.00E-02	G K
			1173.23	2.890E-02	% P	7.903E-02 2.26E-02	G K
Sr-85		-3.3757E-02					
			514.00	-3.376E-02	%(	7.968E-02 2.40E-02	G
Kr-85		-7.3091E+02					
			513.99	-7.309E+02	%(	1.724E+03 5.20E+02	G
Y-88		-9.6156E-04					
			1836.01	-9.616E-04	%(P	2.873E-02 3.90E-03	G K
			898.02	-1.219E-02	& P	7.171E-02 2.03E-02	G
NB-94		-1.4032E-02					
			871.10	-1.403E-02	&(	6.571E-02 1.91E-02	G K
			702.50	1.124E-02	&	5.928E-02 1.72E-02	G K
Ag-108M		-1.6627E-02					
			722.95	-1.663E-02	%(	8.050E-02 2.36E-02	G K
			614.37	-2.016E-02	&	6.132E-02 1.82E-02	G
			433.93	2.236E-02	%	4.870E-02 1.47E-02	G

Yankee Chemistry Spectrum name: 101F_16NOV2004_1640.An1

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CD-109	6.4968E-02						
		88.04	6.497E-02	&(	1.799E+00	5.37E-01	G
SN-113	-1.3084E-02						
		391.71	-1.308E-02	%(P	8.767E-02	2.56E-02	G K
		255.04	5.564E-01	%	2.307E+00	6.88E-01	G
SB-125	1.1467E-01						
		427.95	7.419E-03	%(	1.619E-01	4.67E-02	G K
		600.77	2.067E-02	%	2.289E-01	6.45E-02	G
		636.15	8.341E-02	%	4.675E-01	1.35E-01	G
		463.51	4.321E-01	(	4.772E-01	1.52E-01	G
		176.29	3.462E-02	&	6.496E-01	1.92E-01	G
I-131	2.8866E-04						
		364.48	2.887E-04	&(	8.782E-02	2.52E-02	G K
		636.97	2.897E-01	%	1.160E+00	3.39E-01	G
		284.29	3.923E-01	%	1.169E+00	3.50E-01	G
CS-134	1.9350E-02						
		604.66	-1.439E-02	&(	6.764E-02	1.99E-02	G K
		795.76	5.791E-02	*(	5.701E-02	1.91E-02	G
		569.29	0.000E+00	%	3.555E-01	1.01E-01	G
		801.84	7.862E-02	%	6.281E-01	1.78E-01	G
CS-137	3.2118E-01						
		661.62	3.212E-01	@(	8.773E-02	4.21E-02	G
CE-139	2.7938E-03						
		165.85	2.794E-03	%(P	6.206E-02	1.84E-02	G
EU-152	-4.6664E-03						
		121.78	-4.666E-03	&(	1.533E-01	4.54E-02	G K
		344.30	-3.649E-02	%	1.623E-01	4.80E-02	G
		1408.08	4.969E-02	&	2.651E-01	7.39E-02	G
		964.00	1.456E-01	&	5.644E-01	1.66E-01	G
		1112.07	-1.149E-01	&	6.251E-01	1.81E-01	G
		778.90	3.575E-02	%	3.477E-01	9.70E-02	G
EU-154	-2.3077E-02						
		123.10	-2.308E-02	%(	1.253E-01	3.75E-02	G K
		1274.80	6.148E-02	%	2.036E-01	5.96E-02	G
		723.30	-1.376E-03	&	3.714E-01	1.06E-01	G
		1004.80	8.356E-03	%	3.178E-01	8.68E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
EU-155	8.4058E-02						
		86.45	8.406E-02	%(	2.017E-01	6.10E-02	G K
		105.31	1.118E-01	%	2.268E-01	6.88E-02	G
HG-203	3.0323E-02						
		279.17	3.032E-02	&(P	5.426E-02	1.65E-02	G K
		72.87	-3.179E-01	&	1.382E+00	4.15E-01	G
		70.83	7.798E-02	%	3.332E+00	9.97E-01	G
		82.50	-1.388E+00	%	3.314E+00	1.00E+00	G
TL-208	3.5896E-01						
		583.14	3.590E-01	(	6.801E-02	3.43E-02	G
		510.72	5.619E-01	+	2.026E-01	8.28E-02	G
PB-212	8.2482E-01						
		238.63	8.217E-01	(	1.201E-01	4.84E-02	G K
							Energy duplication
		77.11	8.325E-01	(	4.147E-01	1.33E-01	G
		74.81	1.047E+00	+	8.093E-01	2.53E-01	G
PB-214	5.3945E-01						
		351.99	5.414E-01	(	1.203E-01	4.89E-02	G K
		295.22	5.357E-01	(	2.307E-01	8.01E-02	G
							Energy duplication
		77.11	1.362E+00	+	6.782E-01	2.18E-01	G
		241.92	4.400E-02	%	9.260E-01	2.75E-01	G
BI-212	9.8964E-01						
		727.17	9.896E-01	(	5.764E-01	2.43E-01	G K
		1620.56	-3.965E-02	%	2.031E+00	5.22E-01	G
		785.42	9.528E-01	%	2.432E+00	7.26E-01	G
BI-214	6.0958E-01						
		609.32	5.768E-01	@(	1.099E-01	5.67E-02	G K
		1764.51	6.535E-01	(	1.661E-01	1.21E-01	G
		1120.28	6.635E-01	@(	4.531E-01	1.82E-01	G
RA-224	1.4953E+00						
		241.00	1.495E+00	(	1.389E+00	4.36E-01	G
RA-226	1.5672E+00						
		185.99	1.567E+00	(	1.161E+00	3.80E-01	G
AC-228	1.1487E+00						
		911.07	1.100E+00	@(	2.052E-01	1.12E-01	G K
		968.90	1.247E+00	@(	2.974E-01	1.59E-01	G
		338.40	1.123E+00	@(	3.893E-01	1.65E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TH-227	-1.2673E-01						
		236.00	-1.267E-01	%(	5.164E-01	1.55E-01	G K
		256.25	-1.186E-01	&	7.241E-01	2.15E-01	G
PA-234	5.0639E-02						
		98.44	5.064E-02	&(	2.072E-01	6.22E-02	G K
		946.00	-7.786E-02	%	3.415E-01	9.93E-02	G
		131.28	-3.507E-02	%	2.667E-01	7.97E-02	G
		94.67	-1.659E-01	%	3.939E-01	1.19E-01	G
		883.24	2.720E-01	%	3.900E-01	1.24E-01	G
		926.70	-7.106E-02	%	5.079E-01	1.44E-01	G
		569.26	0.000E+00	%	5.245E-01	1.49E-01	G
TH-234	1.7837E+00						
		63.29	6.576E-01	%(	2.591E+00	7.78E-01	G K
		92.80	2.383E+00	(	1.951E+00	6.10E-01	G
		92.38	2.793E+00	(	2.308E+00	7.21E-01	G
AM-241	-2.1918E-03						
		59.54	-2.192E-03	%(P	3.421E-01	1.01E-01	G

(- This peak used in the nuclide activity average.

* - Peak is too wide, but only one peak in library.
! - Peak is part of a multiplet and this area went negative during deconvolution.
? - Peak is too narrow.
@ - Peak is too wide at FW25M, but ok at FWHM.
% - Peak fails sensitivity test.
$ - Peak identified, but first peak of this nuclide failed one or more qualification tests.
\+ - Peak activity higher than counting uncertainty range.
\- - Peak activity lower than counting uncertainty range.
= - Peak outside analysis energy range.
& - Calculated peak centroid is not close enough to the library energy centroid for positive identification.
P - Peakbackground subtraction
} - Peak is too close to another for the activity to be found directly.

Nuclide Codes:	Peak Codes:
T - Thermal Neutron Activation	G - Gamma Ray
F - Fast Neutron Activation	X - X-Ray
I - Fission Product	P - Positron Decay
N - Naturally Occurring Isotope	S - Single-Escape
P - Photon Reaction	D - Double-Escape
C - Charged Particle Reaction	K - Key Line
M - No MDA Calculation	A - Not in Average

R - Coincidence Corrected C - Coincidence Peak
H - Halflife limit exceeded

- -

***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	2.0078E-02	2.1735E-02	4.0525E-01	4.0525E-01	4.373E-01
K-40		1.6340E+01	1.6340E+01	2.1292E+00	2.3208E+00	
MN-54	#A	-1.5286E-02	-1.5494E-02	5.0203E-02	5.0211E-02	5.652E-02
CO-57	#B	-1.0957E-02	-1.1130E-02	5.8444E-02	5.8447E-02	5.703E-02
CO-60	#B	-4.6438E-03	-4.6541E-03	1.0127E-01	1.0127E-01	7.821E-02
Sr-85	#A	-3.1623E-02	-3.3757E-02	7.2140E-02	7.2165E-02	7.465E-02
Kr-85	#A	-7.3088E+02	-7.3091E+02	1.5604E+03	1.5610E+03	1.723E+03
Y-88	#B	-9.2412E-04	-9.6156E-04	5.7694E-03	5.7696E-03	2.761E-02
NB-94	#B	-1.4032E-02	-1.4032E-02	5.7242E-02	5.7247E-02	6.571E-02
Ag-108M	#B	-1.6625E-02	-1.6627E-02	7.0785E-02	7.0791E-02	8.050E-02
CD-109	#A	6.4364E-02	6.4968E-02	1.6096E+00	1.6096E+00	1.782E+00
SN-113	#B	-1.2611E-02	-1.3084E-02	1.0071E-01	1.0071E-01	8.451E-02
SB-125	#B	1.1420E-01	1.1467E-01	1.2107E-01	1.2124E-01	1.613E-01
I-131	#B	1.7049E-04	2.8866E-04	7.5649E-02	7.5649E-02	5.187E-02
CS-134	#B	1.9241E-02	1.9350E-02	1.9120E-02	1.9151E-02	6.726E-02
CS-137	#	3.2106E-01	3.2118E-01	1.2631E-01	1.2761E-01	
CE-139	#A	2.7091E-03	2.7938E-03	5.5191E-02	5.5191E-02	6.017E-02
EU-152	#B	-4.6622E-03	-4.6664E-03	1.3621E-01	1.3621E-01	1.531E-01
EU-154	#B	-2.3046E-02	-2.3077E-02	1.1251E-01	1.1252E-01	1.252E-01
EU-155	#B	8.3861E-02	8.4058E-02	1.8312E-01	1.8318E-01	2.013E-01
HG-203	#B	2.7689E-02	3.0323E-02	4.9350E-02	4.9380E-02	4.955E-02
TL-208		3.5896E-01	3.5896E-01	1.0282E-01	1.0480E-01	
PB-212	#	8.2482E-01	8.2482E-01	1.4566E-01	1.5293E-01	1.201E-01
PB-214	#	5.3945E-01	5.3945E-01	1.4141E-01	1.4466E-01	1.203E-01
BI-212		9.8964E-01	9.8964E-01	7.2980E-01	7.3194E-01	
BI-214		6.0958E-01	6.0958E-01	1.7974E-01	1.8301E-01	
RA-224		1.4953E+00	1.4953E+00	1.3065E+00	1.3092E+00	
RA-226		1.5672E+00	1.5672E+00	1.1408E+00	1.1442E+00	
AC-228	#	1.1487E+00	1.1487E+00	2.5213E-01	2.6035E-01	
TH-227	#B	-1.2673E-01	-1.2673E-01	4.6395E-01	4.6401E-01	5.164E-01
PA-234	#B	5.0639E-02	5.0639E-02	1.8652E-01	1.8654E-01	2.072E-01
TH-234	#B	1.7837E+00	1.7837E+00	1.3689E+00	1.3725E+00	2.591E+00
AM-241	#A	-2.1918E-03	-2.1918E-03	6.1653E-01	6.1653E-01	3.421E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.

H - Halflife limit exceeded

Yankee Chemistry Spectrum name: 101F_16NOV2004_1640.An1

---------- S U M M A R Y ----------

Total Activity (270.1 to 1999.1 keV) 2.2830534E+01 pCi/gm
Total Decayed Activity (270.1 to 1999.1 keV) 2.2830669E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
VSB

Reviewed by: _____
Supervisor

Laboratory: Yankee Chemistry

Yankee Chemistry Spectrum name: 101F_16NOV2004_1745.An1

Sample description
FSS-OOL-05-01-010-F SOIL

Spectrum Filename: C:\My Documents\FSS_ReanalysisArea\101F_16NOV2004_1745.An1

Acquisition information
Start time: 16-Nov-2004 17:39:59
Live time: 2000
Real time: 2002
Dead time: 0.11 %
Detector ID: 1

Detector system
Det 101- DSPE-633

Calibration
Filename: D1_1LSa.Clb
Detector 101 1.0 Liter Marinelli Sand

Energy Calibration
Created: 03-Sep-2004 08:50:48
Zero offset: 0.244 keV
Gain: 0.500 keV/channel
Quadratic: -2.493E-08 keV/channel^2

Efficiency Calibration
Created: 03-Sep-2004 08:52:26
Type: Polynomial
Uncertainty: 0.626 %
Coefficients: -0.321775 -5.816463 0.734234
-0.099357 0.006049 -0.000149

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.23keV)
Stop channel: 4000 (1999.11keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 1.7280E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.7280E+03) =
5.7870E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00

```
Systematic error:           1.0000000E+00
Fraction Limit:             0.000%
```

Yankee Chemistry Spectrum name: 101F_16NOV2004_1745.An1

Background width: average of five points.
Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	10-Nov-2004 09:40:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	1010K_Background_Det101.Pbc 17-May-2004 16:32:19
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 18 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.1269

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
74.79	191.	24.31	1.50	1.654E-02	74.81	9.600	9.399E-01	PB212
77.12	240.	18.98	1.50	1.720E-02	77.11	17.500	6.225E-01	PB212
					77.11	10.700	1.018E+00	PB214
77.12	240.	18.98	1.50	1.720E-02	77.11	17.500	6.225E-01	PB212
					77.11	10.700	1.018E+00	PB214
87.03	141.	20.20	1.01	1.917E-02	86.45	32.740	1.768E-01	EU155
89.83	83.	35.22	1.02	1.954E-02				
93.17	129.	22.44	1.02	1.992E-02	92.38	2.570	1.976E+00	TH234
					92.80	3.000	1.689E+00	TH234
129.00	87.	41.07	0.70	2.110E-02				
185.70	116.	28.89	1.50	1.860E-02				
185.70	116.	28.89	1.50	1.860E-02	185.99	3.280	1.495E+00	RA226
209.25	101.	31.75	1.04	1.722E-02				
238.70	811.	4.09	1.12	1.557E-02	238.63	43.100	9.449E-01	PB212
241.56	120.	18.89	1.12	1.542E-02	241.00	3.900	1.563E+00	RA224
					241.92	7.470	8.185E-01	PB214
269.76	82.	28.26	0.89	1.403E-02				
295.12	156.	13.99	0.98	1.292E-02				
295.12	156.	13.99	0.98	1.292E-02	295.22	19.200	4.915E-01	PB214
300.06	51.	39.76	1.06	1.273E-02				
338.32	155.	15.41	1.13	1.135E-02	338.40	12.010	8.910E-01	AC228
351.95	300.	10.78	1.19	1.093E-02				
351.95	300.	10.78	1.19	1.093E-02	351.99	37.100	5.798E-01	PB214
463.25	39.	40.41	1.50	8.342E-03	463.51	10.000	PBC<MDA	SB125
510.83	131.	14.36	1.92	7.589E-03	510.72	22.500	5.989E-01	TL208
583.24	249.	9.32	1.18	6.683E-03	583.14	86.000	3.382E-01	TL208

609.20	234.	9.32	1.31	6.414E-03	609.32	46.090	6.202E-01	BI214
661.46	52.	20.71	1.00	5.939E-03	661.62	84.620	8.128E-02	CS137
727.63	70.	24.13	1.73	5.440E-03	727.17	11.800	8.475E-01	BI212
794.86	51.	29.46	1.18	5.021E-03				
794.86	51.	29.46	1.18	5.021E-03	795.76	85.400	9.402E-02	CS134
911.02	161.	10.41	1.69	4.447E-03	911.07	29.000	9.764E-01	AC228
968.21	96.	18.02	1.03	4.215E-03	968.90	17.460	1.023E+00	AC228
1119.60	72.	21.52	1.90	3.711E-03	1120.28	15.040	1.009E+00	BI214

Yankee Chemistry Spectrum name: 101F_16NOV2004_1745.An1

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
1460.61	599.	4.20	1.94	2.943E-03	1460.75	10.700	1.489E+01	K40
1764.29	33.	19.58	1.42	2.481E-03	1764.51	15.920	6.454E-01	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
173.62	86.92	357.	119.	0.060	72.75	1.014	TB-160	D
179.24	89.72	386.	83.	0.042	105.67	1.016	PB-214	lD
418.16	209.25	355.	101.	0.050	95.25	1.038	AC-228	
477.10	238.71	144.	811.	0.406	12.26	1.122	PB-212	D
482.82	241.57	199.	120.	0.060	56.68	1.124	PB-214	D
539.24	269.76	184.	82.	0.041	84.79	0.893	AC-228	s
599.88	300.06	153.	51.	0.026	110.32	1.065	PB-212	

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-212	149.15	74.79	981.	191.	0.095	72.93	1.499
PB-212	153.79	77.11	915.	240.	0.120	56.94	1.499D
PB-214	153.79	77.11	915.	240.	0.120	56.94	1.499D
EU-155	173.64	87.03	869.	139.	0.069	93.77	1.499s
TH-234	185.93	93.17	838.	146.	0.073	87.65	1.499s
TH-234	185.90	93.16	796.	151.	0.076	82.82	1.499s
RA-226	371.73	186.04	463.	101.	0.050	95.42	1.499s
PB-212	477.16	238.73	416.	617.	0.308	18.51	1.499
RA-224	483.15	241.73	472.	100.	0.050	96.84	1.499
PB-214	590.23	295.24	196.	150.	0.075	46.64	1.499s
AC-228	676.43	338.32	155.	155.	0.078	46.24	1.132
PB-214	703.66	351.93	136.	232.	0.116	29.09	1.499
SB-125	926.40	463.25	102.	39.	0.019	121.23	1.499s
TL-208	1021.59	510.83	79.	131.	0.065	43.07	1.920s
TL-208	1166.50	583.24	87.	249.	0.124	27.97	1.180
BI-214	1218.44	609.20	68.	234.	0.117	27.97	1.305s
CS-137	1323.01	661.46	31.	52.	0.026	62.13	0.999
BI-212	1455.41	727.63	64.	70.	0.035	72.40	1.731s
CS-134	1590.39	795.08	45.	39.	0.020	87.02	1.502s
AC-228	1822.40	911.02	40.	161.	0.080	31.24	1.695

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Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
AC-228	1936.83	968.21	64.	96.	0.048	54.05	1.034s
BI-214	2239.79	1119.60	42.	72.	0.036	64.55	1.899s
K-40	2922.23	1460.61	9.	599.	0.300	12.60	1.938
BI-214	3530.01	1764.29	2.	33.	0.016	58.75	1.418s

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	Peak MDA Value pCi/gm	COMMENTS
BE-7		-1.8780E-04					
			477.56	-1.878E-04	&(	4.078E-01 1.15E-01 G	
K-40		1.4886E+01					
			1460.75	1.489E+01	(	4.087E-01 6.25E-01 G	
MN-54		2.5074E-02					
			834.81	2.507E-02	%(	3.937E-02 1.24E-02 G	
CO-57		-7.1846E-03					
			122.07	-7.185E-03	&(P	5.510E-02 1.64E-02 G K	
			136.43	-1.127E-01	%	4.167E-01 1.25E-01 G	
CO-60		-1.3184E-02					
			1332.51	-1.318E-02	%(P	7.388E-02 1.86E-02 G K	
			1173.23	7.850E-03	% P	8.308E-02 2.31E-02 G K	
Sr-85		-2.4378E-02					
			514.00	-2.438E-02	%(	6.741E-02 2.02E-02 G	
Kr-85		-5.2592E+02					
			513.99	-5.259E+02	%(	1.454E+03 4.36E+02 G	
Y-88		-8.1621E-03					
			1836.01	-8.162E-03	%(P	5.457E-02 1.44E-02 G K	
			898.02	-1.380E-02	% P	6.999E-02 2.01E-02 G	
NB-94		7.5747E-03					
			871.10	7.575E-03	&(	4.600E-02 1.31E-02 G K	
			702.50	0.000E+00	&	5.573E-02 1.58E-02 G K	
Ag-108M		-2.6839E-02					
			722.95	-2.684E-02	&(	7.963E-02 2.38E-02 G K	
			614.37	-1.442E-02	%	5.601E-02 1.65E-02 G	

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
		433.93	-4.258E-03	%	5.111E-02	1.48E-02	G
CD-109	-5.1006E-01						
		88.04	-5.101E-01	&(	1.418E+00	4.28E-01	G
SN-113	-3.0010E-04						
		391.71	-3.001E-04	&(P	4.970E-02	1.39E-02	G K
		255.04	-5.393E-01	%	1.982E+00	5.92E-01	G
SB-125	9.8066E-02						
		427.95	8.624E-03	%(	1.248E-01	3.58E-02	G K
		600.77	-2.169E-02	%	2.738E-01	7.86E-02	G
		636.15	-8.824E-02	%	3.904E-01	1.14E-01	G
		463.51	3.628E-01	*(	4.686E-01	1.47E-01	G
		176.29	1.445E-02	%	7.094E-01	2.10E-01	G
I-131	2.1608E-02						
		364.48	2.161E-02	%(	6.077E-02	1.81E-02	G K
		636.97	3.874E-01	%	8.683E-01	2.62E-01	G
		284.29	-1.253E-01	%	1.180E+00	3.47E-01	G
CS-134	3.4190E-02						
		604.66	1.328E-03	%(	1.178E-01	3.48E-02	G K
		795.76	7.175E-02	(	6.218E-02	2.08E-02	G
		569.29	-6.218E-02	&	2.891E-01	8.44E-02	G
		801.84	3.149E-02	%	5.852E-01	1.64E-01	G
CS-137	8.1282E-02						
		661.62	8.128E-02	(	4.449E-02	1.68E-02	G
CE-139	3.1980E-03						
		165.85	3.198E-03	%(P	5.777E-02	1.72E-02	G
EU-152	-6.9941E-03						
		121.78	-6.994E-03	%(	1.563E-01	4.65E-02	G K
		344.30	-2.894E-02	%	1.657E-01	4.89E-02	G
		1408.08	4.643E-02	&	2.634E-01	7.39E-02	G
		964.00	-3.982E-01	%	6.862E-01	2.10E-01	G
		1112.07	-6.229E-02	%	4.862E-01	1.38E-01	G
		778.90	6.724E-02	%	3.277E-01	9.41E-02	G
EU-154	-1.1872E-02						
		123.10	-1.187E-02	%(	1.080E-01	3.22E-02	G K
		1274.80	2.179E-02	&	2.073E-01	5.87E-02	G
		723.30	-7.737E-03	%	5.089E-01	1.49E-01	G
		1004.80	-2.612E-02	%	3.204E-01	8.99E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
EU-155	1.7375E-01						
		86.45	1.738E-01	(	1.756E-01	5.43E-02	G K
		105.31	1.206E-01	%	2.091E-01	6.37E-02	G
HG-203	-1.0697E-02						
		279.17	-1.070E-02	%(P	5.570E-02	1.62E-02	G K
		72.87	-3.998E-01	%	1.397E+00	4.21E-01	G
		70.83	-4.628E-01	&	2.476E+00	7.43E-01	G
		82.50	-8.862E-01	%	2.994E+00	9.02E-01	G
TL-208	3.3819E-01						
		583.14	3.382E-01	(	6.295E-02	3.15E-02	G
		510.72	5.989E-01	+	2.023E-01	8.60E-02	G
PB-212	6.9071E-01						
		238.63	7.184E-01	(	1.138E-01	4.43E-02	G K
							Energy duplication
		77.11	6.225E-01	(	3.732E-01	1.18E-01	G
		74.81	9.399E-01	&	7.321E-01	2.29E-01	G
PB-214	4.5519E-01						
		351.99	4.468E-01	(	1.102E-01	4.33E-02	G K
		295.22	4.714E-01	@(	2.140E-01	7.33E-02	G
							Energy duplication
		77.11	1.018E+00	+	6.103E-01	1.93E-01	G
		241.92	4.880E-02	%	8.444E-01	2.51E-01	G
BI-212	8.4746E-01						
		727.17	8.475E-01	@(	4.883E-01	2.05E-01	G K
		1620.56	1.147E+00	&	1.634E+00	5.37E-01	G
		785.42	-4.786E-01	%	2.620E+00	7.56E-01	G
BI-214	6.2667E-01						
		609.32	6.202E-01	@(	1.085E-01	5.78E-02	G K
		1764.51	6.454E-01	(	1.966E-01	1.26E-01	G
		1120.28	1.009E+00	+	4.611E-01	2.17E-01	G
RA-224	1.2998E+00						
		241.00	1.300E+00	(	1.350E+00	4.20E-01	G
RA-226	1.2923E+00						
		185.99	1.292E+00	*(	1.321E+00	4.11E-01	G
AC-228	9.7276E-01						
		911.07	9.764E-01	(	1.952E-01	1.02E-01	G K
		968.90	1.023E+00	(	4.246E-01	1.84E-01	G
		338.40	8.910E-01	(	3.481E-01	1.37E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TH-227	-1.6325E-01						
		236.00	-1.633E-01	&(	5.122E-01	1.54E-01	G K
		256.25	2.180E-02	%	6.013E-01	1.77E-01	G
PA-234	9.5380E-04						
		98.44	9.538E-04	%(	1.819E-01	5.40E-02	G K
		946.00	3.834E-02	&	2.903E-01	8.28E-02	G
		131.28	4.241E-04	%	2.422E-01	7.20E-02	G
		94.67	-2.118E-01	%	3.732E-01	1.14E-01	G
		883.24	-8.467E-02	&	5.132E-01	1.48E-01	G
		926.70	-7.116E-02	%	5.435E-01	1.55E-01	G
		569.26	-9.173E-02	&	4.264E-01	1.24E-01	G
TH-234	1.7418E+00						
		63.29	1.229E+00	%(	2.339E+00	7.11E-01	G K
		92.80	1.982E+00	(	1.759E+00	5.47E-01	G
		92.38	2.240E+00	(	2.110E+00	6.54E-01	G
AM-241	2.8945E-03						
		59.54	2.894E-03	%(P	3.220E-01	9.57E-02	G

(- This peak used in the nuclide activity average.

* - Peak is too wide, but only one peak in library.
! - Peak is part of a multiplet and this area went negative during deconvolution.
? - Peak is too narrow.
@ - Peak is too wide at FW25M, but ok at FWHM.
% - Peak fails sensitivity test.
$ - Peak identified, but first peak of this nuclide failed one or more qualification tests.
\+ - Peak activity higher than counting uncertainty range.
\- - Peak activity lower than counting uncertainty range.
= - Peak outside analysis energy range.
& - Calculated peak centroid is not close enough to the library energy centroid for positive identification.
P - Peakbackground subtraction
} - Peak is too close to another for the activity to be found directly.

Nuclide Codes:	Peak Codes:
T - Thermal Neutron Activation	G - Gamma Ray
F - Fast Neutron Activation	X - X-Ray
I - Fission Product	P - Positron Decay
N - Naturally Occurring Isotope	S - Single-Escape
P - Photon Reaction	D - Double-Escape
C - Charged Particle Reaction	K - Key Line
M - No MDA Calculation	A - Not in Average

Yankee Chemistry Spectrum name: 101F_16NOV2004_1745.An1

R - Coincidence Corrected C - Coincidence Peak
H - Halflife limit exceeded

- -

***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	-1.7298E-04	-1.8780E-04	3.4621E-01	3.4621E-01	3.756E-01
K-40		1.4886E+01	1.4886E+01	1.8751E+00	2.0551E+00	
MN-54	#A	2.4724E-02	2.5074E-02	3.7177E-02	3.7204E-02	3.882E-02
CO-57	#B	-7.0687E-03	-7.1846E-03	5.7956E-02	5.7957E-02	5.421E-02
CO-60	#B	-1.3154E-02	-1.3184E-02	5.9479E-01	5.9479E-01	7.371E-02
Sr-85	#A	-2.2782E-02	-2.4378E-02	6.0674E-02	6.0690E-02	6.300E-02
Kr-85	#A	-5.2589E+02	-5.2592E+02	1.3090E+03	1.3094E+03	1.454E+03
Y-88	#B	-7.8328E-03	-8.1621E-03	5.3287E-02	5.3289E-02	5.237E-02
NB-94	#B	7.5747E-03	7.5747E-03	3.9210E-02	3.9212E-02	4.600E-02
Ag-108M	#B	-2.6836E-02	-2.6839E-02	7.1327E-02	7.1343E-02	7.962E-02
CD-109	#A	-5.0514E-01	-5.1006E-01	1.2837E+00	1.2840E+00	1.404E+00
SN-113	#B	-2.8887E-04	-3.0010E-04	6.1994E-02	6.1994E-02	4.784E-02
SB-125	#B	9.7641E-02	9.8066E-02	1.1889E-01	1.1901E-01	1.242E-01
I-131	#B	1.2516E-02	2.1608E-02	5.4341E-02	5.4355E-02	3.520E-02
CS-134	#B	3.3991E-02	3.4190E-02	2.9752E-02	2.9814E-02	1.171E-01
CS-137		8.1250E-02	8.1282E-02	5.0503E-02	5.0711E-02	
CE-139	#A	3.0975E-03	3.1980E-03	5.1476E-02	5.1476E-02	5.596E-02
EU-152	#B	-6.9875E-03	-6.9941E-03	1.3946E-01	1.3946E-01	1.561E-01
EU-154	#B	-1.1855E-02	-1.1872E-02	9.6604E-02	9.6606E-02	1.079E-01
EU-155	#A	1.7333E-01	1.7375E-01	1.6293E-01	1.6321E-01	1.752E-01
HG-203	#B	-9.7350E-03	-1.0697E-02	1.0585E-01	1.0585E-01	5.069E-02
TL-208		3.3819E-01	3.3819E-01	9.4575E-02	9.6486E-02	
PB-212	#	6.9071E-01	6.9071E-01	1.2787E-01	1.3369E-01	1.138E-01
PB-214	#	4.5519E-01	4.5519E-01	1.2511E-01	1.2773E-01	1.102E-01
BI-212	#	8.4746E-01	8.4746E-01	6.1355E-01	6.1541E-01	
BI-214		6.2667E-01	6.2667E-01	1.7531E-01	1.7885E-01	
RA-224	#A	1.2998E+00	1.2998E+00	1.2587E+00	1.2608E+00	1.350E+00
RA-226	#A	1.2923E+00	1.2923E+00	1.2331E+00	1.2352E+00	1.321E+00
AC-228		9.7276E-01	9.7276E-01	2.5189E-01	2.5782E-01	
TH-227	#B	-1.6325E-01	-1.6325E-01	4.6249E-01	4.6259E-01	5.122E-01
PA-234	#B	9.5380E-04	9.5380E-04	1.6187E-01	1.6187E-01	1.819E-01
TH-234	#B	1.7418E+00	1.7418E+00	1.2269E+00	1.2307E+00	2.339E+00
AM-241	#A	2.8944E-03	2.8945E-03	2.8703E-01	2.8703E-01	3.220E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.

H - Halflife limit exceeded

Yankee Chemistry Spectrum name: 101F_16NOV2004_1745.An1

---------- S U M M A R Y ----------

Total Activity (269.6 to 1999.1 keV) 1.7752197E+01 pCi/gm
Total Decayed Activity (269.6 to 1999.1 keV) 1.7752230E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
VSB

Reviewed by: _____
Supervisor

Laboratory: Yankee Chemistry

Yankee Chemistry Spectrum name: 101F_16NOV2004_1825.An1

Sample description
FSS-OOL-05-01-003-F SOIL

Spectrum Filename: C:\My Documents\FSS_ReanalysisArea\101F_16NOV2004_1825.An1

Acquisition information

Start time:	16-Nov-2004 18:17:38
Live time:	2000
Real time:	2002
Dead time:	0.12 %
Detector ID:	1

Detector system
Det 101- DSPE-633

Calibration
Filename: D1_1LSa.Clb
Detector 101 1.0 Liter Marinelli Sand

Energy Calibration

Created:	03-Sep-2004 08:50:48
Zero offset:	0.244 keV
Gain:	0.500 keV/channel
Quadratic:	-2.493E-08 keV/channel^2

Efficiency Calibration

Created:	03-Sep-2004 08:52:26
Type:	Polynomial
Uncertainty:	0.626 %
Coefficients:	-0.321775 -5.816463 0.734234
	-0.099357 0.006049 -0.000149

Library Files

Main analysis library:	FSS_Rev_1.Lib
Library Match Width:	1.000
Peak stripping:	Library based

Analysis parameters

Analysis engine:	Env32 G53W4.20
Start channel:	100 (50.23keV)
Stop channel:	4000 (1999.11keV)
Peak rejection level:	41.667%
Peak search sensitivity:	3
Sample Size:	1.5490E+03
Activity scaling factor:	1.0000E+06/(1.0000E+00* 1.5490E+03) = 6.4558E+02
Detection limit method:	Nureg 4.16
Random error:	1.0000000E+00

```
Systematic error:           1.0000000E+00
Fraction Limit:             0.000%
```

Yankee Chemistry Spectrum name: 101F_16NOV2004_1825.An1

Background width: average of five points.
Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	10-Nov-2004 16:18:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	1010K_Background_Det101.Pbc 17-May-2004 16:32:19
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 16 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.0664

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
74.71	235.	13.78	1.00	1.651E-02				
74.71	235.	13.78	1.00	1.651E-02	74.81	9.600	1.291E+00	PB212
77.07	428.	7.96	1.01	1.720E-02				
77.07	428.	7.96	1.01	1.720E-02	77.11	10.700	2.028E+00	PB214
					77.11	17.500	1.240E+00	PB212
87.33	99.	29.05	1.01	1.925E-02	86.45	32.740	1.380E-01	EU155
89.50	90.	32.96	1.02	1.954E-02				
93.56	126.	22.91	1.02	1.999E-02	92.38	2.570	2.158E+00	TH234
					92.80	3.000	1.844E+00	TH234
					94.67	15.500	3.537E-01	PA234
185.81	104.	26.62	1.11	1.859E-02				
185.81	104.	26.62	1.11	1.859E-02	185.99	3.280	1.494E+00	RA226
209.26	85.	31.74	1.25	1.722E-02				
238.74	838.	4.04	1.12	1.557E-02	238.63	43.100	1.089E+00	PB212
241.60	114.	19.68	1.12	1.542E-02	241.00	3.900	1.649E+00	RA224
					241.92	7.470	8.635E-01	PB214
270.01	85.	26.56	1.55	1.401E-02				
295.18	174.	12.61	1.22	1.292E-02				
295.18	174.	12.61	1.22	1.292E-02	295.22	19.200	6.123E-01	PB214
300.31	80.	22.98	0.63	1.272E-02				
327.69	39.	39.16	1.00	1.171E-02				
338.70	161.	15.48	1.07	1.134E-02	338.40	12.010	1.033E+00	AC228
351.97	259.	7.97	1.34	1.093E-02				
351.97	259.	7.97	1.34	1.093E-02	351.99	37.100	5.571E-01	PB214
409.41	52.	28.52	0.81	9.422E-03				
463.19	53.	31.38	1.32	8.347E-03				

463.19	53.	31.38	1.32	8.347E-03	463.51	10.000	5.545E-01	SB125
510.79	123.	17.04	1.59	7.589E-03	510.72	22.500	6.303E-01	TL208
583.09	248.	10.47	1.29	6.685E-03	583.14	86.000	3.764E-01	TL208
609.29	225.	9.08	1.35	6.413E-03	609.32	46.090	6.641E-01	BI214
661.62	77.	20.51	1.25	5.937E-03	661.62	84.620	1.334E-01	CS137
727.41	78.	20.54	0.75	5.441E-03	727.17	11.800	1.065E+00	BI212
795.35	23.	38.90	1.50	5.016E-03	795.76	85.400	PBC<MDA	CS134
861.06	32.	27.32	1.44	4.675E-03				
911.11	156.	9.66	1.30	4.446E-03	911.07	29.000	1.054E+00	AC228
967.42	96.	14.66	1.72	4.218E-03	968.90	17.460	1.139E+00	AC228
1120.56	62.	18.93	1.37	3.710E-03	1120.28	15.040	9.754E-01	BI214
1460.59	519.	4.69	1.96	2.943E-03	1460.75	10.700	1.438E+01	K40

Yankee Chemistry Spectrum name: 101F_16NOV2004_1825.An1

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
1764.86	30.	18.26	1.25	2.481E-03	1764.51	15.920	6.625E-01	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
148.98	74.72	407.	235.	0.117	41.35	1.005	BI-207	D
153.71	77.08	367.	428.	0.214	23.89	1.006	PB-214	D
174.23	87.54	361.	99.	0.049	87.16	1.014	PB-214	lD
418.19	209.26	278.	85.	0.042	95.23	1.245	AC-228	s
477.19	238.78	152.	837.	0.419	12.10	1.122	PB-212	D
539.75	270.01	178.	85.	0.043	79.67	1.549	AC-228	s
600.37	300.31	111.	79.	0.040	65.45	0.632	PB-212	s
655.15	327.69	95.	39.	0.020	117.48	1.000	AC-228	
818.66	409.41	70.	52.	0.026	85.57	0.806	AC-228	
1722.42	861.06	18.	32.	0.016	81.96	1.445	TL-208	s

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-212	149.23	74.83	1013.	198.	0.099	71.59	1.499
PB-214	153.79	77.11	872.	350.	0.175	39.17	1.499D
PB-212	153.79	77.11	872.	350.	0.175	39.17	1.499D
CD-109	182.61	91.52	944.	-161.	-0.081	84.36	1.499
TH-234	185.78	93.10	795.	166.	0.083	75.90	1.499s
TH-234	185.77	93.09	771.	164.	0.082	75.55	1.499s
PA-234	185.70	93.06	573.	165.	0.082	65.91	1.499s
RA-226	371.84	186.09	433.	92.	0.046	101.04	1.499s
PB-212	477.16	238.73	366.	671.	0.336	16.75	1.499
RA-224	481.70	241.00	450.	90.	0.045	105.00	1.123D
PB-214	590.18	295.22	177.	163.	0.082	41.82	1.499
AC-228	677.19	338.70	160.	161.	0.081	46.44	1.075s
PB-214	703.70	351.95	97.	260.	0.130	24.62	1.499
SB-125	926.08	463.09	60.	50.	0.025	77.41	1.499
TL-208	1021.53	510.79	97.	123.	0.062	51.12	1.593s
TL-208	1166.19	583.09	112.	248.	0.124	31.40	1.291
CS-134	1200.94	600.46	-14.	-17.	-0.009	17.50	1.499s
BI-214	1218.61	609.29	55.	225.	0.112	27.24	1.355

Yankee Chemistry Spectrum name: 101F_16NOV2004_1825.An1

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
CS-137	1323.33	661.62	61.	77.	0.038	61.54	1.252s
BI-212	1454.97	727.41	48.	78.	0.039	61.62	0.752s
CS-134	1590.92	795.35	27.	23.	0.011	116.71	1.502s
AC-228	1822.57	911.11	25.	156.	0.078	28.97	1.301
AC-228	1935.24	967.42	34.	96.	0.048	43.97	1.720s
BI-214	2241.72	1120.56	27.	62.	0.031	56.79	1.375s
K-40	2922.20	1460.59	15.	519.	0.259	14.07	1.957
BI-214	3531.15	1764.86	0.	30.	0.015	54.77	1.249s

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	MDA Value pCi/gm	COMMENTS
BE-7		-1.9010E-02					
			477.56	-1.901E-02	%(	4.484E-01 1.28E-01	G
K-40		1.4375E+01					
			1460.75	1.438E+01	(	5.785E-01 6.74E-01	G
MN-54		-1.8870E-02					
			834.81	-1.887E-02	%(	5.903E-02 1.74E-02	G
CO-57		7.3101E-03					
			122.07	7.310E-03	%(P	5.775E-02 1.72E-02	G K
			136.43	-3.008E-02	%	4.292E-01 1.27E-01	G
CO-60		-1.6099E-02					
			1332.51	-1.610E-02	&(P	6.581E-02 1.49E-02	G K
			1173.23	1.584E-02	% P	8.223E-02 2.29E-02	G K
Sr-85		-2.1802E-02					
			514.00	-2.180E-02	%(	6.804E-02 2.03E-02	G
Kr-85		-4.7160E+02					
			513.99	-4.716E+02	%(	1.472E+03 4.39E+02	G
Y-88		-9.4217E-04					
			1836.01	-9.422E-04	%(P	6.405E-02 1.61E-02	G K
			898.02	4.583E-03	& P	6.051E-02 1.68E-02	G
NB-94		-5.5986E-03					
			871.10	-5.599E-03	%(	5.286E-02 1.49E-02	G K
			702.50	4.183E-03	&	5.226E-02 1.48E-02	G K

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
Ag-108M	0.0000E+00						
		722.95	0.000E+00	%(	1.223E-01	3.57E-02	G K
		614.37	-1.048E-02	%	6.148E-02	1.79E-02	G
		433.93	5.283E-03	%	5.394E-02	1.57E-02	G
CD-109	-1.9358E+00						
		88.04	-1.936E+00	(	1.754E+00	5.44E-01	G
SN-113	-1.3496E-02						
		391.71	-1.350E-02	%(P	7.932E-02	2.32E-02	G K
		255.04	2.184E-01	&	2.119E+00	6.24E-01	G
SB-125	1.3813E-01						
		427.95	5.652E-03	%(	1.621E-01	4.67E-02	G K
		600.77	4.336E-03	%	2.339E-01	6.52E-02	G
		636.15	-9.795E-02	%	4.672E-01	1.36E-01	G
		463.51	5.303E-01	(	4.064E-01	1.37E-01	G
		176.29	-1.691E-01	%	7.815E-01	2.34E-01	G
I-131	2.1373E-02						
		364.48	2.137E-02	%(	8.699E-02	2.57E-02	G K
		636.97	-2.477E-01	%	1.172E+00	3.41E-01	G
		284.29	1.522E-01	%	1.275E+00	3.76E-01	G
CS-134	-2.3857E-02						
		604.66	-2.386E-02	(	1.026E-02	1.39E-03	G K
		795.76	4.611E-02	+	5.524E-02	1.79E-02	G
		569.29	-6.010E-02	%	3.474E-01	1.01E-01	G
		801.84	-7.915E-02	%	6.206E-01	1.76E-01	G
CS-137	1.3340E-01						
		661.62	1.334E-01	(	6.803E-02	2.74E-02	G
CE-139	-7.4620E-03						
		165.85	-7.462E-03	&(P	4.535E-02	1.34E-02	G
EU-152	-6.0120E-03						
		121.78	-6.012E-03	%(	1.689E-01	5.02E-02	G K
		344.30	-3.857E-02	%	1.771E-01	5.24E-02	G
		1408.08	1.180E-01	%	2.659E-01	8.02E-02	G
		964.00	-6.590E-02	%	4.526E-01	1.29E-01	G
		1112.07	3.343E-02	&	4.938E-01	1.38E-01	G
		778.90	5.347E-02	&	3.304E-01	9.33E-02	G
EU-154	1.4408E-03						
		123.10	1.441E-03	&(	1.219E-01	3.62E-02	G K
		1274.80	1.816E-02	%	1.939E-01	5.40E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
		723.30	-4.449E-02	%	3.421E-01	9.90E-02	G
		1004.80	-1.250E-02	&	3.509E-01	9.73E-02	G
EU-155	7.4443E-03						
		86.45	7.444E-03	%(	2.207E-01	6.59E-02	G K
		105.31	5.192E-02	%	2.391E-01	7.17E-02	G
HG-203	-1.0045E-03						
		279.17	-1.004E-03	&(P	6.496E-02	1.89E-02	G K
		72.87	-5.959E-01	%	1.596E+00	4.82E-01	G
		70.83	6.816E-01	&	2.482E+00	7.47E-01	G
		82.50	0.000E+00	%	3.527E+00	1.05E+00	G
TL-208	3.7636E-01						
		583.14	3.764E-01	(	7.895E-02	3.94E-02	G
		510.72	6.303E-01	+	2.478E-01	1.07E-01	G
PB-212	9.1353E-01						
		238.63	8.721E-01	(	1.195E-01	4.87E-02	G K
							Energy duplication
		77.11	1.016E+00	(	4.066E-01	1.33E-01	G
		74.81	1.085E+00	&	8.296E-01	2.59E-01	G
PB-214	5.6386E-01						
		351.99	5.587E-01	(	1.047E-01	4.59E-02	G K
		295.22	5.739E-01	(	2.276E-01	8.00E-02	G
							Energy duplication
		77.11	1.661E+00	+	6.650E-01	2.17E-01	G
		241.92	-2.375E-02	%	9.369E-01	2.78E-01	G
BI-212	1.0649E+00						
		727.17	1.065E+00	@(	4.735E-01	2.19E-01	G K
		1620.56	4.951E-01	%	1.408E+00	4.09E-01	G
		785.42	1.953E-01	%	2.394E+00	6.69E-01	G
BI-214	6.6372E-01						
		609.32	6.641E-01	(	1.100E-01	6.03E-02	G K
		1764.51	6.625E-01	(	1.628E-01	1.21E-01	G
		1120.28	9.754E-01	+	4.180E-01	1.85E-01	G
RA-224	1.3017E+00						
		241.00	1.302E+00	(	1.471E+00	4.56E-01	G
RA-226	1.3149E+00						
		185.99	1.315E+00	@(	1.426E+00	4.43E-01	G
AC-228	1.0750E+00						
		911.07	1.054E+00	(	1.766E-01	1.02E-01	G K
		968.90	1.139E+00	*(	3.545E-01	1.67E-01	G
		338.40	1.033E+00	@(	3.941E-01	1.60E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TH-227	-9.3062E-02						
		236.00	-9.306E-02	%(	5.336E-01	1.59E-01	G K
		256.25	-5.954E-02	%	5.808E-01	1.71E-01	G
PA-234	-1.1682E-01						
		98.44	-1.168E-01	%(	2.030E-01	6.18E-02	G K
		946.00	0.000E+00	%	2.850E-01	7.81E-02	G
		131.28	3.533E-02	&	2.583E-01	7.72E-02	G
		94.67	4.619E-01	+	3.202E-01	1.01E-01	G
		883.24	0.000E+00	&	5.369E-01	1.50E-01	G
		926.70	-1.009E-01	%	5.489E-01	1.58E-01	G
		569.26	-8.882E-02	%	5.125E-01	1.49E-01	G
TH-234	1.9064E+00						
							Energy duplication
		63.29	9.179E-01	%(	2.587E+00	7.81E-01	G K
		92.80	2.398E+00	(	1.931E+00	6.04E-01	G
		92.38	2.833E+00	&(	2.294E+00	7.17E-01	G
AM-241	-1.0782E-02						
		59.54	-1.078E-02	%(P	3.328E-01	9.88E-02	G

(- This peak used in the nuclide activity average.

* - Peak is too wide, but only one peak in library.
! - Peak is part of a multiplet and this area went negative during deconvolution.
? - Peak is too narrow.
@ - Peak is too wide at FW25M, but ok at FWHM.
% - Peak fails sensitivity test.
$ - Peak identified, but first peak of this nuclide failed one or more qualification tests.
\+ - Peak activity higher than counting uncertainty range.
\- - Peak activity lower than counting uncertainty range.
= - Peak outside analysis energy range.
& - Calculated peak centroid is not close enough to the library energy centroid for positive identification.
P - Peakbackground subtraction
} - Peak is too close to another for the activity to be found directly.

Nuclide Codes:	Peak Codes:
T - Thermal Neutron Activation	G - Gamma Ray
F - Fast Neutron Activation	X - X-Ray
I - Fission Product	P - Positron Decay
N - Naturally Occurring Isotope	S - Single-Escape
P - Photon Reaction	D - Double-Escape
C - Charged Particle Reaction	K - Key Line
M - No MDA Calculation	A - Not in Average

Yankee Chemistry Spectrum name: 101F_16NOV2004_1825.An1

R - Coincidence Corrected C - Coincidence Peak
H - Halflife limit exceeded

- -

***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	-1.7567E-02	-1.9010E-02	3.8288E-01	3.8288E-01	4.144E-01
K-40		1.4375E+01	1.4375E+01	2.0222E+00	2.1792E+00	
MN-54	#A	-1.8617E-02	-1.8870E-02	5.2281E-02	5.2292E-02	5.824E-02
CO-57	#B	7.1968E-03	7.3101E-03	5.1654E-02	5.1656E-02	5.685E-02
CO-60	#B	-1.6064E-02	-1.6099E-02	9.1780E-01	9.1780E-01	6.566E-02
Sr-85	#A	-2.0429E-02	-2.1802E-02	6.0914E-02	6.0926E-02	6.375E-02
Kr-85	#A	-4.7158E+02	-4.7160E+02	1.3177E+03	1.3180E+03	1.472E+03
Y-88	#B	-9.0563E-04	-9.4217E-04	2.3788E-02	2.3788E-02	6.156E-02
NB-94	#B	-5.5986E-03	-5.5986E-03	4.4550E-02	4.4551E-02	5.286E-02
Ag-108M	#B	0.0000E+00	0.0000E+00	1.0701E-01	1.0701E-01	1.223E-01
CD-109	#A	-1.9179E+00	-1.9358E+00	1.6331E+00	1.6366E+00	1.738E+00
SN-113	#B	-1.3010E-02	-1.3496E-02	8.9749E-02	8.9752E-02	7.647E-02
SB-125	#B	1.3755E-01	1.3813E-01	1.0693E-01	1.0721E-01	1.614E-01
I-131	#B	1.2651E-02	2.1373E-02	7.7130E-02	7.7140E-02	5.149E-02
CS-134	#A	-2.3724E-02	-2.3857E-02	4.1748E-03	4.3871E-03	1.020E-02
CS-137	#	1.3335E-01	1.3340E-01	8.2091E-02	8.2437E-02	
CE-139	#A	-7.2367E-03	-7.4620E-03	4.1218E-02	4.1220E-02	4.398E-02
EU-152	#B	-6.0065E-03	-6.0120E-03	1.5056E-01	1.5056E-01	1.688E-01
EU-154	#B	1.4388E-03	1.4408E-03	1.0851E-01	1.0851E-01	1.217E-01
EU-155	#B	7.4270E-03	7.4443E-03	1.9768E-01	1.9768E-01	2.201E-01
HG-203	#B	-9.1757E-04	-1.0045E-03	9.0221E-02	9.0221E-02	5.934E-02
TL-208		3.7636E-01	3.7636E-01	1.1816E-01	1.2006E-01	
PB-212	#	9.1353E-01	9.1353E-01	1.5303E-01	1.6150E-01	1.195E-01
PB-214	#	5.6386E-01	5.6386E-01	1.3682E-01	1.4048E-01	1.047E-01
BI-212	#	1.0649E+00	1.0649E+00	6.5616E-01	6.5891E-01	
BI-214		6.6372E-01	6.6372E-01	1.8082E-01	1.8467E-01	
RA-224	A	1.3017E+00	1.3017E+00	1.3668E+00	1.3688E+00	
RA-226	#A	1.3149E+00	1.3149E+00	1.3285E+00	1.3306E+00	1.426E+00
AC-228		1.0750E+00	1.0750E+00	2.5160E-01	2.5883E-01	
TH-227	#B	-9.3062E-02	-9.3062E-02	4.7795E-01	4.7798E-01	5.336E-01
PA-234	#B	-1.1682E-01	-1.1682E-01	1.8548E-01	1.8559E-01	2.030E-01
TH-234	#B	1.9064E+00	1.9064E+00	1.4404E+00	1.4442E+00	2.587E+00
AM-241	#A	-1.0782E-02	-1.0782E-02	3.3935E-01	3.3935E-01	3.328E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.

H - Halflife limit exceeded

Yankee Chemistry Spectrum name: 101F_16NOV2004_1825.An1

---------- S U M M A R Y ----------

Total Activity (269.6 to 1999.1 keV) 1.8990580E+01 pCi/gm
Total Decayed Activity (269.6 to 1999.1 keV) 1.8990631E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
VSB

Reviewed by: _____
Supervisor

Laboratory: Yankee Chemistry

Yankee Chemistry Spectrum name: 101F_16NOV2004_1900.An1

Sample description
FSS-OOL-05-01-004-F SOIL

Spectrum Filename: C:\My Documents\FSS_ReanalysisArea\101F_16NOV2004_1900.An1

Acquisition information
Start time: 16-Nov-2004 18:55:36
Live time: 2000
Real time: 2003
Dead time: 0.13 %
Detector ID: 1

Detector system
Det 101- DSPE-633

Calibration
Filename: D1_1LSa.Clb
Detector 101 1.0 Liter Marinelli Sand

Energy Calibration
Created: 03-Sep-2004 08:50:48
Zero offset: 0.244 keV
Gain: 0.500 keV/channel
Quadratic: -2.493E-08 keV/channel^2

Efficiency Calibration
Created: 03-Sep-2004 08:52:26
Type: Polynomial
Uncertainty: 0.626 %
Coefficients: -0.321775 -5.816463 0.734234
-0.099357 0.006049 -0.000149

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.23keV)
Stop channel: 4000 (1999.11keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 1.2330E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.2330E+03) =
8.1103E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00

```
Systematic error:           1.0000000E+00
Fraction Limit:             0.000%
```

Yankee Chemistry Spectrum name: 101F_16NOV2004_1900.An1

Background width: average of five points.
Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	10-Nov-2004 14:22:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	1010K_Background_Det101.Pbc 17-May-2004 16:32:19
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 14 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.0919

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
74.28	147.	20.89	1.00	1.651E-02				
74.28	147.	20.89	1.00	1.651E-02	74.81	9.600	1.016E+00	PB212
77.35	319.	9.33	1.01	1.738E-02	77.11	10.700	1.902E+00	PB214
					77.11	17.500	1.163E+00	PB212
93.03	130.	30.22	1.50	1.989E-02	92.38	2.570	2.783E+00	TH234
					92.80	3.000	2.379E+00	TH234
					98.44	25.100	2.774E-01	PA234
93.04	122.	32.76	1.50	1.985E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	2.247E+00	TH234
					98.44	25.100	2.620E-01	PA234
186.20	104.	29.54	1.32	1.857E-02	185.99	3.280	1.870E+00	RA226
209.43	82.	30.55	1.07	1.721E-02				
238.67	641.	4.72	1.12	1.558E-02				
238.67	641.	4.72	1.12	1.558E-02	238.63	43.100	1.047E+00	PB212
241.78	67.	30.28	1.12	1.542E-02	241.00	3.900	1.212E+00	RA224
					241.92	7.470	6.349E-01	PB214
269.94	45.	37.52	1.29	1.402E-02				
295.21	133.	12.90	1.16	1.292E-02	295.22	19.200	5.855E-01	PB214
299.95	36.	41.05	1.16	1.273E-02				
338.45	154.	14.45	1.31	1.135E-02	338.40	12.010	1.242E+00	AC228
351.95	280.	8.94	0.99	1.093E-02				
351.95	280.	8.94	0.99	1.093E-02	351.99	37.100	7.580E-01	PB214
510.59	90.	16.67	1.59	7.592E-03	510.72	22.500	5.776E-01	TL208
582.97	204.	10.98	1.24	6.686E-03	583.14	86.000	3.889E-01	TL208
609.27	231.	8.72	1.45	6.413E-03	609.32	46.090	8.566E-01	BI214
661.69	163.	11.16	1.46	5.937E-03	661.62	84.620	3.557E-01	CS137

726.70	59.	24.59	1.44	5.446E-03				
726.70	59.	24.59	1.44	5.446E-03	727.17	11.800	1.002E+00	BI212
794.88	25.	36.96	1.33	5.021E-03				
794.88	25.	36.96	1.33	5.021E-03	795.76	85.400	6.330E-02	CS134
860.37	50.	27.73	1.00	4.678E-03				
911.18	114.	11.12	1.50	4.446E-03	911.07	29.000	9.723E-01	AC228
968.41	124.	15.66	1.47	4.214E-03	968.90	17.460	1.851E+00	AC228
1120.52	50.	27.42	0.87	3.711E-03	1120.28	15.040	9.819E-01	BI214

Yankee Chemistry Spectrum name: 101F_16NOV2004_1900.An1

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
1460.68	641.	4.01	1.90	2.943E-03	1460.75	10.700	2.231E+01	K40
1764.56	30.	20.56	1.64	2.481E-03	1764.51	15.920	8.240E-01	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
418.53	209.43	238.	82.	0.041	91.66	1.067	AC-228	
477.04	238.50	138.	641.	0.321	14.17	1.122	PB-212	D
483.26	241.61	170.	67.	0.033	90.85	1.124	PB-214	D
539.61	269.94	120.	45.	0.023	112.55	1.294	AC-228	
599.66	300.05	91.	36.	0.018	123.14	1.165	PB-212	lD
1589.99	794.88	25.	26.	0.013	102.12	1.334	AC-228	s
1721.03	860.37	44.	50.	0.025	83.18	0.996	TL-208	s

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-212	149.07	74.75	810.	193.	0.097	66.04	1.499
PB-214	153.79	77.11	737.	290.	0.145	43.49	1.499D
PB-212	153.79	77.11	737.	290.	0.145	43.49	1.499D
TH-234	185.67	93.04	742.	122.	0.061	98.27	1.499s
TH-234	185.64	93.03	701.	130.	0.065	90.65	1.499s
RA-226	371.63	185.99	383.	99.	0.049	89.42	1.499s
PB-212	476.93	238.61	304.	563.	0.282	18.23	1.499
PB-214	590.33	295.29	167.	127.	0.063	50.70	1.499
AC-228	676.69	338.45	128.	154.	0.077	43.36	1.313
PB-214	703.96	352.08	125.	230.	0.115	28.55	1.499s
TL-208	1021.11	510.59	54.	90.	0.045	50.00	1.587s
TL-208	1165.95	582.97	85.	204.	0.102	32.93	1.240
BI-214	1218.58	609.27	50.	231.	0.116	26.17	1.450
CS-137	1323.47	661.69	56.	163.	0.082	33.48	1.464
BI-212	1454.69	727.27	44.	39.	0.020	86.01	1.499s
AC-228	1822.70	911.18	22.	114.	0.057	33.37	1.495
AC-228	1937.23	968.41	58.	124.	0.062	46.99	1.470
BI-214	2241.63	1120.52	46.	50.	0.025	82.27	0.874s
K-40	2922.37	1460.68	4.	641.	0.320	12.03	1.902
BI-214	3530.56	1764.56	2.	30.	0.015	61.68	1.637

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	MDA Value pCi/gm	COMMENTS
BE-7		1.7800E-01					
			477.56	1.780E-01	%(	5.994E-01 1.77E-01	G
K-40		2.2314E+01					
			1460.75	2.231E+01	(	4.188E-01 8.95E-01	G
MN-54		2.3939E-02					
			834.81	2.394E-02	%(	6.908E-02 2.05E-02	G
CO-57		-9.3899E-04					
			122.07	-9.390E-04	&(P	4.603E-02 1.34E-02	G K
			136.43	-1.783E-01	%	5.385E-01 1.62E-01	G
CO-60		-1.1246E-02					
			1332.51	-1.125E-02	%(P	9.164E-02 2.25E-02	G K
			1173.23	2.895E-02	& P	1.118E-01 3.18E-02	G K
Sr-85		-4.0061E-02					
			514.00	-4.006E-02	%(	8.638E-02 2.62E-02	G
Kr-85		-8.6566E+02					
			513.99	-8.657E+02	%(	1.866E+03 5.65E+02	G
Y-88		-7.6110E-03					
			1836.01	-7.611E-03	&(P	6.885E-02 1.75E-02	G K
			898.02	-1.073E-02	% P	8.748E-02 2.46E-02	G
NB-94		0.0000E+00					
			871.10	0.000E+00	&(	7.439E-02 2.06E-02	G K
			702.50	9.465E-03	&	7.091E-02 2.04E-02	G K
Ag-108M		-1.4707E-02					
			722.95	-1.471E-02	&(	9.682E-02 2.81E-02	G K
			614.37	-2.595E-02	%	7.965E-02 2.37E-02	G
			433.93	-1.005E-02	&	7.373E-02 2.16E-02	G
CD-109		2.8317E-01					
			88.04	2.832E-01	%(	2.004E+00 5.99E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SN-113	-1.2860E-02						
		391.71	-1.286E-02	%(P	9.796E-02	2.85E-02	G K
		255.04	5.182E-01	%	2.622E+00	7.78E-01	G
SB-125	-5.0984E-02						
		427.95	-5.098E-02	&(	1.899E-01	5.61E-02	G K
		600.77	-3.675E-02	%	3.503E-01	1.00E-01	G
		636.15	-4.086E-02	&	5.831E-01	1.66E-01	G
		463.51	4.307E-01	%	6.206E-01	1.93E-01	G
		176.29	-9.481E-02	%	7.981E-01	2.37E-01	G
I-131	-7.1936E-04						
		364.48	-7.194E-04	&(	8.545E-02	2.42E-02	G K
		636.97	4.975E-01	%	1.309E+00	3.91E-01	G
		284.29	0.000E+00	%	1.757E+00	5.14E-01	G
CS-134	-6.1880E-04						
		604.66	-6.188E-04	%(	5.992E-02	1.68E-02	G K
		795.76	-2.745E-03	%	8.596E-02	2.41E-02	G
		569.29	4.016E-02	&	4.016E-01	1.15E-01	G
		801.84	7.323E-02	&	6.144E-01	1.71E-01	G
CS-137	3.5570E-01						
		661.62	3.557E-01	(	8.201E-02	3.97E-02	G
CE-139	2.0218E-02						
		165.85	2.022E-02	&(P	6.360E-02	1.91E-02	G
EU-152	3.7625E-02						
		121.78	3.762E-02	&(	1.825E-01	5.45E-02	G K
		344.30	5.394E-02	%	1.746E-01	5.19E-02	G
		1408.08	1.486E-01	%	2.802E-01	8.70E-02	G
		964.00	2.405E-01	&	6.848E-01	2.04E-01	G
		1112.07	2.018E-01	%	6.606E-01	1.94E-01	G
		778.90	0.000E+00	%	6.313E-01	1.78E-01	G
EU-154	-2.7862E-02						
		123.10	-2.786E-02	%(	1.401E-01	4.19E-02	G K
		1274.80	0.000E+00	%	3.134E-01	8.75E-02	G
		723.30	-7.136E-02	&	4.474E-01	1.30E-01	G
		1004.80	1.983E-01	%	4.146E-01	1.26E-01	G
EU-155	9.0334E-02						
		86.45	9.033E-02	%(	2.409E-01	7.28E-02	G K
		105.31	4.399E-02	%	2.738E-01	8.17E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
HG-203	-6.6833E-03						
		279.17	-6.683E-03	%(P	7.509E-02	2.17E-02	G K
		72.87	-3.015E-01	%	1.857E+00	5.57E-01	G
		70.83	1.154E+00	&	2.214E+00	6.73E-01	G
		82.50	-1.209E+00	%	3.831E+00	1.15E+00	G
TL-208	3.8893E-01						
		583.14	3.889E-01	(	8.708E-02	4.27E-02	G
		510.72	5.776E-01	+	2.371E-01	9.62E-02	G
PB-212	9.5852E-01						
		238.63	9.194E-01	(	1.371E-01	5.59E-02	G K
							Energy duplication
		77.11	1.055E+00	(	4.705E-01	1.53E-01	G
		74.81	1.335E+00	&	9.340E-01	2.94E-01	G
PB-214	6.0154E-01						
		351.99	6.225E-01	@(	1.482E-01	5.93E-02	G K
		295.22	5.610E-01	(	2.778E-01	9.48E-02	G
							Energy duplication
		77.11	1.725E+00	+	7.695E-01	2.50E-01	G
		241.92	2.552E-02	%	1.015E+00	3.01E-01	G
BI-212	6.7300E-01						
		727.17	6.730E-01	*(	5.750E-01	1.93E-01	G K
		1620.56	6.437E-01	%	2.095E+00	5.99E-01	G
		785.42	5.250E-01	&	3.644E+00	1.04E+00	G
BI-214	8.7431E-01						
		609.32	8.566E-01	(	1.322E-01	7.47E-02	G K
		1764.51	8.240E-01	(	2.713E-01	1.69E-01	G
		1120.28	9.819E-01	(	6.739E-01	2.69E-01	G
RA-224	9.1600E-01						
		241.00	9.160E-01	%(	1.765E+00	5.37E-01	G
RA-226	1.7739E+00						
		185.99	1.774E+00	(	1.688E+00	5.29E-01	G
AC-228	1.0514E+00						
		911.07	9.723E-01	(	2.071E-01	1.08E-01	G K
		968.90	1.851E+00	+	5.684E-01	2.90E-01	G
		338.40	1.242E+00	(	4.449E-01	1.80E-01	G
TH-227	-9.6012E-02						
		236.00	-9.601E-02	%(	5.243E-01	1.56E-01	G K
		256.25	-1.531E-01	%	8.438E-01	2.50E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
PA-234	-3.4998E-03						
		98.44	-3.500E-03	%(	1.941E-01	5.72E-02	G K
		946.00	0.000E+00	&	4.920E-01	1.39E-01	G
		131.28	-4.729E-02	&	2.914E-01	8.70E-02	G
		94.67	1.754E-03	%	4.600E-01	1.37E-01	G
		883.24	3.104E-02	%	5.660E-01	1.57E-01	G
		926.70	2.180E-01	%	6.164E-01	1.82E-01	G
		569.26	5.951E-02	&	5.923E-01	1.70E-01	G
TH-234	1.9083E+00						
		63.29	1.072E+00	&(	3.013E+00	9.09E-01	G K
		92.80	2.379E+00	&(	2.316E+00	7.19E-01	G
		92.38	2.628E+00	&(	2.785E+00	8.61E-01	G
AM-241	-1.2310E-01						
		59.54	-1.231E-01	%(P	4.437E-01	1.33E-01	G

(- This peak used in the nuclide activity average.

* - Peak is too wide, but only one peak in library.
! - Peak is part of a multiplet and this area went negative during deconvolution.
? - Peak is too narrow.
@ - Peak is too wide at FW25M, but ok at FWHM.
% - Peak fails sensitivity test.
$ - Peak identified, but first peak of this nuclide failed one or more qualification tests.
\+ - Peak activity higher than counting uncertainty range.
\- - Peak activity lower than counting uncertainty range.
= - Peak outside analysis energy range.
& - Calculated peak centroid is not close enough to the library energy centroid for positive identification.
P - Peakbackground subtraction
} - Peak is too close to another for the activity to be found directly.

Nuclide Codes:	Peak Codes:
T - Thermal Neutron Activation	G - Gamma Ray
F - Fast Neutron Activation	X - X-Ray
I - Fission Product	P - Positron Decay
N - Naturally Occurring Isotope	S - Single-Escape
P - Photon Reaction	D - Double-Escape
C - Charged Particle Reaction	K - Key Line
M - No MDA Calculation	A - Not in Average
R - Coincidence Corrected	C - Coincidence Peak
H - Halflife limit exceeded	

- -

Yankee Chemistry Spectrum name: 101F_16NOV2004_1900.An1

***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	1.6426E-01	1.7800E-01	5.3245E-01	5.3254E-01	5.531E-01
K-40		2.2314E+01	2.2314E+01	2.6849E+00	2.9662E+00	
MN-54	#A	2.3612E-02	2.3939E-02	6.1391E-02	6.1406E-02	6.814E-02
CO-57	#B	-9.2419E-04	-9.3899E-04	5.5502E-01	5.5502E-01	4.531E-02
CO-60	#B	-1.1221E-02	-1.1246E-02	2.0539E-01	2.0539E-01	9.144E-02
Sr-85	#A	-3.7496E-02	-4.0061E-02	7.8461E-02	7.8494E-02	8.085E-02
Kr-85	#A	-8.6562E+02	-8.6566E+02	1.6954E+03	1.6961E+03	1.866E+03
Y-88	#B	-7.3107E-03	-7.6110E-03	7.1892E-02	7.1894E-02	6.613E-02
NB-94	#B	0.0000E+00	0.0000E+00	6.1880E-02	6.1880E-02	7.439E-02
Ag-108M	#B	-1.4706E-02	-1.4707E-02	8.4438E-02	8.4442E-02	9.681E-02
CD-109	#A	2.8050E-01	2.8317E-01	1.7981E+00	1.7981E+00	1.985E+00
SN-113	#B	-1.2389E-02	-1.2860E-02	1.1985E-01	1.1985E-01	9.438E-02
SB-125	#B	-5.0769E-02	-5.0984E-02	1.6843E-01	1.6845E-01	1.891E-01
I-131	#B	-4.2187E-04	-7.1936E-04	7.2521E-02	7.2521E-02	5.011E-02
CS-134	#B	-6.1529E-04	-6.1880E-04	5.0338E-02	5.0338E-02	5.958E-02
CS-137		3.5557E-01	3.5570E-01	1.1911E-01	1.2079E-01	
CE-139	#A	1.9597E-02	2.0218E-02	5.7278E-02	5.7289E-02	6.164E-02
EU-152	#B	3.7590E-02	3.7625E-02	1.6363E-01	1.6364E-01	1.823E-01
EU-154	#B	-2.7824E-02	-2.7862E-02	1.2568E-01	1.2569E-01	1.399E-01
EU-155	#B	9.0120E-02	9.0334E-02	2.1829E-01	2.1835E-01	2.403E-01
HG-203	#B	-6.0953E-03	-6.6833E-03	6.8735E-01	6.8735E-01	6.849E-02
TL-208		3.8893E-01	3.8893E-01	1.2808E-01	1.2996E-01	
PB-212	#	9.5852E-01	9.5852E-01	1.7478E-01	1.8297E-01	1.371E-01
PB-214	#	6.0154E-01	6.0154E-01	1.7176E-01	1.7509E-01	1.482E-01
BI-212	#	6.7300E-01	6.7300E-01	5.7888E-01	5.8013E-01	5.750E-01
BI-214		8.7431E-01	8.7431E-01	2.2879E-01	2.3406E-01	
RA-224	#A	9.1600E-01	9.1600E-01	1.6095E+00	1.6103E+00	1.765E+00
RA-226	#	1.7738E+00	1.7739E+00	1.5861E+00	1.5893E+00	1.688E+00
AC-228		1.0514E+00	1.0514E+00	2.8764E-01	2.9371E-01	
TH-227	#B	-9.6012E-02	-9.6012E-02	4.6777E-01	4.6780E-01	5.243E-01
PA-234	#B	-3.4998E-03	-3.4998E-03	1.7159E-01	1.7159E-01	1.941E-01
TH-234	#B	1.9083E+00	1.9083E+00	1.7299E+00	1.7331E+00	3.013E+00
AM-241	#A	-1.2309E-01	-1.2310E-01	4.0609E-01	4.0615E-01	4.437E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

Yankee Chemistry Spectrum name: 101F_16NOV2004_1900.An1

---------- S U M M A R Y ----------

Total Activity (269.6 to 1999.1 keV) 2.4983734E+01 pCi/gm
Total Decayed Activity (269.6 to 1999.1 keV) 2.4983871E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
VSB

Reviewed by: _____
Supervisor

Laboratory: Yankee Chemistry

Yankee Chemistry Spectrum name: 101F_16NOV2004_1940.An1

Sample description
FSS-OOL-05-01-015-F SOIL

Spectrum Filename: C:\My Documents\FSS_ReanalysisArea\101F_16NOV2004_1940.An1

Acquisition information

Start time:	16-Nov-2004 19:34:04
Live time:	2000
Real time:	2002
Dead time:	0.12 %
Detector ID:	1

Detector system
Det 101- DSPE-633

Calibration
Filename: D1_1LSa.Clb
Detector 101 1.0 Liter Marinelli Sand

Energy Calibration

Created:	03-Sep-2004 08:50:48
Zero offset:	0.244 keV
Gain:	0.500 keV/channel
Quadratic:	-2.493E-08 keV/channel^2

Efficiency Calibration

Created:	03-Sep-2004 08:52:26
Type:	Polynomial
Uncertainty:	0.626 %
Coefficients:	-0.321775 -5.816463 0.734234
	-0.099357 0.006049 -0.000149

Library Files

Main analysis library:	FSS_Rev_1.Lib
Library Match Width:	1.000
Peak stripping:	Library based

Analysis parameters

Analysis engine:	Env32 G53W4.20
Start channel:	100 (50.23keV)
Stop channel:	4000 (1999.11keV)
Peak rejection level:	41.667%
Peak search sensitivity:	3
Sample Size:	1.4980E+03
Activity scaling factor:	1.0000E+06/(1.0000E+00* 1.4980E+03) = 6.6756E+02
Detection limit method:	Nureg 4.16
Random error:	1.0000000E+00

```
Systematic error:           1.0000000E+00
Fraction Limit:             0.000%
```

Yankee Chemistry Spectrum name: 101F_16NOV2004_1940.An1

Background width: average of five points.
Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	10-Nov-2004 11:23:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	1010K_Background_Det101.Pbc 17-May-2004 16:32:19
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 17 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.0975

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
74.82	182.	26.15	1.50	1.654E-02	72.87	6.400	1.777E+00	HG203
					74.81	9.600	1.036E+00	PB212
76.97	305.	15.02	1.50	1.720E-02	77.11	17.500	9.129E-01	PB212
					77.11	10.700	1.493E+00	PB214
76.97	305.	15.02	1.50	1.720E-02	77.11	17.500	9.129E-01	PB212
					77.11	10.700	1.493E+00	PB214
86.95	126.	21.73	1.01	1.917E-02				
89.94	108.	24.03	1.02	1.957E-02				
93.28	124.	21.88	1.02	1.995E-02	92.38	2.570	2.200E+00	TH234
					92.80	3.000	1.881E+00	TH234
185.64	136.	26.18	1.21	1.860E-02				
185.64	136.	26.18	1.21	1.860E-02	185.99	3.280	2.019E+00	RA226
209.38	94.	28.86	0.88	1.721E-02				
238.71	848.	3.97	1.12	1.557E-02	238.63	43.100	1.140E+00	PB212
242.44	111.	10.90	1.50	1.545E-02	241.00	3.900	1.667E+00	RA224
270.22	56.	32.89	0.86	1.400E-02				
295.18	163.	15.79	1.29	1.292E-02				
295.18	163.	15.79	1.29	1.292E-02	295.22	19.200	5.928E-01	PB214
300.34	47.	33.44	1.33	1.271E-02				
338.43	190.	14.35	1.13	1.135E-02	338.40	12.010	1.258E+00	AC228
351.87	282.	8.79	1.03	1.093E-02				
351.87	282.	8.79	1.03	1.093E-02	351.99	37.100	6.268E-01	PB214
463.32	63.	29.97	0.86	8.345E-03				
463.32	63.	29.97	0.86	8.345E-03	463.51	10.000	6.886E-01	SB125
510.87	114.	17.45	1.42	7.588E-03	510.72	22.500	6.022E-01	TL208
582.99	255.	7.81	1.35	6.686E-03	583.14	86.000	3.995E-01	TL208

609.37	212.	9.62	1.20	6.412E-03	609.32	46.090	6.471E-01	BI214
726.84	37.	26.90	1.63	5.445E-03	727.17	11.800	5.253E-01	BI212
860.57	41.	25.86	1.70	4.677E-03				
910.96	133.	11.02	1.62	4.447E-03	911.07	29.000	9.332E-01	AC228
967.35	116.	16.95	1.55	4.218E-03	968.90	17.460	1.420E+00	AC228
1119.91	66.	18.36	1.38	3.712E-03	1120.28	15.040	1.075E+00	BI214
1460.68	572.	4.26	1.80	2.943E-03	1460.75	10.700	1.639E+01	K40
1764.50	19.	27.69	2.11	2.481E-03	1764.51	15.920	4.391E-01	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
173.69	86.98	328.	117.	0.058	71.37	1.014	TB-160	D
179.47	89.98	285.	108.	0.054	72.09	1.016	PB-214	lD
418.43	209.38	269.	94.	0.047	86.59	0.878	AC-228	s
477.11	238.69	143.	848.	0.424	11.91	1.122	PB-212	D
482.07	241.16	417.	107.	0.053	86.09	1.123	RA-224	lD
482.07	241.16	417.	107.	0.053	86.09	1.123	PB-214	D
540.17	270.22	138.	56.	0.028	98.66	0.864	AC-228	
600.43	300.34	100.	47.	0.023	100.32	1.329	PB-212	s
1721.44	860.57	25.	41.	0.020	77.59	1.700	TL-208	s

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-212	149.20	74.82	1046.	182.	0.091	78.46	1.499s
PB-212	153.79	77.11	895.	305.	0.152	45.06	1.499D
PB-214	153.79	77.11	895.	305.	0.152	45.06	1.499D
TH-234	185.57	93.00	735.	148.	0.074	81.73	1.499s
RA-226	371.90	186.12	433.	100.	0.050	93.12	1.499
PB-212	476.98	238.64	412.	633.	0.317	18.08	1.499
RA-224	481.70	241.00	18.	111.	0.056	32.70	1.499D
PB-214	590.28	295.27	218.	154.	0.077	47.39	1.499s
AC-228	676.64	338.43	168.	190.	0.095	43.05	1.132s
PB-214	703.87	352.04	128.	242.	0.121	27.66	1.499s
SB-125	925.93	463.02	84.	51.	0.026	87.02	1.499s
TL-208	1021.67	510.87	88.	114.	0.057	52.34	1.417s
TL-208	1165.99	582.99	50.	255.	0.127	23.44	1.353
BI-214	1218.78	609.37	68.	212.	0.106	28.86	1.195
BI-212	1453.83	726.84	27.	37.	0.019	80.71	1.632
AC-228	1822.26	910.96	31.	133.	0.067	33.05	1.623
AC-228	1935.12	967.35	61.	116.	0.058	50.84	1.553s
BI-214	2240.42	1119.91	28.	66.	0.033	55.09	1.375s
K-40	2922.37	1460.68	6.	572.	0.286	12.79	1.804
BI-214	3530.44	1764.50	5.	19.	0.010	83.08	2.106

s - Peak fails shape tests.
D - Peak area deconvoluted.

A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Code	MDA Value pCi/gm	COMMENTS
BE-7		3.9155E-02					
			477.56	3.916E-02	&(	4.544E-01 1.30E-01	G
K-40		1.6395E+01					
			1460.75	1.639E+01	(	3.992E-01 6.99E-01	G
MN-54		-1.3285E-02					
			834.81	-1.328E-02	&(	7.048E-02 2.04E-02	G
CO-57		-1.3905E-02					
			122.07	-1.390E-02	%(P	5.804E-02 1.74E-02	G K
			136.43	2.202E-03	%	4.865E-01 1.44E-01	G
CO-60		-1.2504E-02					
			1332.51	-1.250E-02	&(P	7.313E-02 1.75E-02	G K
			1173.23	-1.122E-03	& P	9.644E-02 2.63E-02	G K
Sr-85		-1.5118E-02					
			514.00	-1.512E-02	&(	7.203E-02 2.13E-02	G
Kr-85		-3.2618E+02					
			513.99	-3.262E+02	&(	1.554E+03 4.59E+02	G
Y-88		1.3779E-02					
			1836.01	1.378E-02	%(P	5.596E-02 1.55E-02	G K
			898.02	1.991E-02	& P	6.179E-02 1.81E-02	G
NB-94		-4.5732E-03					
			871.10	-4.573E-03	%(	6.441E-02 1.82E-02	G K
			702.50	-1.268E-02	%	6.085E-02 1.77E-02	G K
Ag-108M		-1.7493E-02					
			722.95	-1.749E-02	%(	7.009E-02 2.06E-02	G K
			614.37	-2.093E-02	&	6.319E-02 1.88E-02	G
			433.93	-5.577E-04	%	5.009E-02 1.43E-02	G
CD-109		4.4333E-01					
			88.04	4.433E-01	%(	1.537E+00 4.62E-01	G
SN-113		1.0998E-02					
			391.71	1.100E-02	%(P	7.546E-02 2.20E-02	G K
			255.04	-6.278E-01	&	2.438E+00 7.28E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	1.2463E-01						
		427.95	-2.080E-02	%(	1.771E-01	5.16E-02	G K
		600.77	-8.790E-03	%	2.995E-01	8.51E-02	G
		636.15	5.406E-02	%	4.485E-01	1.28E-01	G
		463.51	5.551E-01	*(	4.943E-01	1.61E-01	G
		176.29	1.454E-01	&	7.078E-01	2.11E-01	G
I-131	1.1842E-02						
		364.48	1.184E-02	&(	9.207E-02	2.69E-02	G K
		636.97	-1.638E-01	&	1.324E+00	3.81E-01	G
		284.29	4.769E-01	%	1.170E+00	3.52E-01	G
CS-134	-2.8570E-03						
		604.66	-2.857E-03	%(	6.100E-02	1.74E-02	G K
		795.76	0.000E+00	%	7.877E-02	2.22E-02	G
		569.29	4.735E-02	%	3.437E-01	9.93E-02	G
		801.84	2.108E-01	&	6.276E-01	1.86E-01	G
CS-137	4.3255E-02						
		661.62	4.326E-02	%(	6.686E-02	2.08E-02	G
CE-139	-1.2999E-04						
		165.85	-1.300E-04	%(P	6.302E-02	1.86E-02	G
EU-152	-3.7871E-02						
		121.78	-3.787E-02	%(	1.719E-01	5.15E-02	G K
		344.30	-5.020E-02	%	1.829E-01	5.44E-02	G
		1408.08	7.678E-02	&	2.644E-01	7.62E-02	G
		964.00	2.772E-01	&	6.416E-01	1.93E-01	G
		1112.07	-1.227E-01	%	5.720E-01	1.66E-01	G
		778.90	-7.489E-02	&	4.816E-01	1.39E-01	G
EU-154	-2.4888E-02						
		123.10	-2.489E-02	%(	1.128E-01	3.38E-02	G K
		1274.80	-1.053E-02	&	2.054E-01	5.67E-02	G
		723.30	-7.627E-02	%	3.140E-01	9.19E-02	G
		1004.80	-4.335E-02	%	3.670E-01	1.04E-01	G
EU-155	-5.5933E-03						
		86.45	-5.593E-03	%(	1.609E-01	4.77E-02	G K
		105.31	8.529E-02	%	2.428E-01	7.32E-02	G
HG-203	6.5229E-03						
		279.17	6.523E-03	&(P	6.120E-02	1.79E-02	G K
		72.87	-1.639E-01	%	1.676E+00	5.02E-01	G
		70.83	-4.534E-01	&	2.927E+00	8.78E-01	G
		82.50	-1.129E-01	&	3.230E+00	9.62E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	3.9953E-01						
		583.14	3.995E-01	(	5.617E-02	3.12E-02	G
		510.72	6.022E-01	+	2.452E-01	1.05E-01	G
PB-212	8.6895E-01						
		238.63	8.511E-01	(	1.308E-01	5.13E-02	G K
							Energy duplication
		77.11	9.129E-01	(	4.258E-01	1.37E-01	G
		74.81	1.036E+00	&	8.718E-01	2.71E-01	G
PB-214	5.4616E-01						
		351.99	5.394E-01	@(	1.236E-01	4.97E-02	G K
		295.22	5.593E-01	(	2.602E-01	8.83E-02	G
							Energy duplication
		77.11	1.493E+00	+	6.964E-01	2.24E-01	G
		241.92	-7.041E-01	%	9.672E-01	2.97E-01	G
BI-212	5.2531E-01						
		727.17	5.253E-01	(	3.756E-01	1.41E-01	G K
		1620.56	1.419E-01	%	2.172E+00	5.74E-01	G
		785.42	9.734E-01	%	2.312E+00	6.94E-01	G
BI-214	6.4706E-01						
		609.32	6.471E-01	(	1.256E-01	6.23E-02	G K
		1764.51	4.391E-01	-	2.892E-01	1.22E-01	G
		1120.28	1.075E+00	+	4.459E-01	1.97E-01	G
RA-224	1.6674E+00						
		241.00	1.667E+00	!(	3.366E-01	1.82E-01	G
RA-226	1.4813E+00						
		185.99	1.481E+00	(	1.474E+00	4.60E-01	G
AC-228	9.3324E-01						
		911.07	9.332E-01	(	1.993E-01	1.03E-01	G K
		968.90	1.420E+00	+	4.804E-01	2.40E-01	G
		338.40	1.258E+00	+	4.175E-01	1.81E-01	G
TH-227	-2.5129E-01						
		236.00	-2.513E-01	&(	6.215E-01	1.88E-01	G K
		256.25	3.392E-01	%	6.536E-01	1.99E-01	G
PA-234	-5.5543E-02						
		98.44	-5.554E-02	%(	2.170E-01	6.51E-02	G K
		946.00	4.666E-02	&	2.670E-01	7.57E-02	G
		131.28	1.375E-01	&	2.354E-01	7.17E-02	G
		94.67	-1.187E-01	%	3.872E-01	1.17E-01	G
		883.24	-1.350E-01	%	5.233E-01	1.53E-01	G
		926.70	1.819E-01	%	4.372E-01	1.31E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
		569.26	7.005E-02	%	5.069E-01	1.46E-01	G
TH-234	1.5732E+00						
		63.29	1.067E+00	%(	2.687E+00	8.12E-01	G K
		92.80	2.232E+00	(	1.951E+00	6.08E-01	G
		92.38	5.647E-02	%	2.352E+00	7.00E-01	G
AM-241	4.9117E-02						
		59.54	4.912E-02	%(P	3.658E-01	1.09E-01	G

(- This peak used in the nuclide activity average.

* - Peak is too wide, but only one peak in library.
! - Peak is part of a multiplet and this area went negative during deconvolution.
? - Peak is too narrow.
@ - Peak is too wide at FW25M, but ok at FWHM.
% - Peak fails sensitivity test.
$ - Peak identified, but first peak of this nuclide failed one or more qualification tests.
+ - Peak activity higher than counting uncertainty range.
- - Peak activity lower than counting uncertainty range.
= - Peak outside analysis energy range.
& - Calculated peak centroid is not close enough to the library energy centroid for positive identification.
P - Peakbackground subtraction
} - Peak is too close to another for the activity to be found directly.

Nuclide Codes:	Peak Codes:
T - Thermal Neutron Activation	G - Gamma Ray
F - Fast Neutron Activation	X - X-Ray
I - Fission Product	P - Positron Decay
N - Naturally Occurring Isotope	S - Single-Escape
P - Photon Reaction	D - Double-Escape
C - Charged Particle Reaction	K - Key Line
M - No MDA Calculation	A - Not in Average
R - Coincidence Corrected	C - Coincidence Peak
H - Halflife limit exceeded	

- -

***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	3.6061E-02	3.9155E-02	3.9004E-01	3.9005E-01	4.185E-01
K-40		1.6395E+01	1.6395E+01	2.0964E+00	2.2920E+00	
MN-54	#A	-1.3099E-02	-1.3285E-02	6.1350E-02	6.1354E-02	6.949E-02
CO-57	#B	-1.3680E-02	-1.3905E-02	5.7379E-02	5.7384E-02	5.710E-02
CO-60	#B	-1.2476E-02	-1.2504E-02	2.7747E-01	2.7747E-01	7.297E-02

Sr-85	#A	-1.4127E-02	-1.5118E-02	6.3785E-02	6.3791E-02	6.731E-02
Kr-85	#A	-3.2617E+02	-3.2618E+02	1.3761E+03	1.3762E+03	1.554E+03
Y-88	#B	1.3222E-02	1.3779E-02	4.6393E-02	4.6400E-02	5.370E-02
NB-94	#B	-4.5732E-03	-4.5732E-03	5.4570E-02	5.4571E-02	6.441E-02
Ag-108M	#B	-1.7492E-02	-1.7493E-02	6.1684E-02	6.1692E-02	7.008E-02
CD-109	#A	4.3905E-01	4.4333E-01	1.3865E+00	1.3868E+00	1.522E+00
SN-113	#B	1.0586E-02	1.0998E-02	6.5978E-02	6.5981E-02	7.263E-02
SB-125	#B	1.2409E-01	1.2463E-01	1.0846E-01	1.0869E-01	1.763E-01
I-131	#B	6.8551E-03	1.1842E-02	8.0552E-02	8.0555E-02	5.330E-02
CS-134	#B	-2.8404E-03	-2.8570E-03	5.2344E-02	5.2344E-02	6.065E-02
CS-137	#A	4.3238E-02	4.3255E-02	6.2325E-02	6.2373E-02	6.683E-02
CE-139	#A	-1.2590E-04	-1.2999E-04	2.5135E-01	2.5135E-01	6.104E-02
EU-152	#B	-3.7836E-02	-3.7871E-02	1.5452E-01	1.5453E-01	1.717E-01
EU-154	#B	-2.4853E-02	-2.4888E-02	1.0129E-01	1.0130E-01	1.127E-01
EU-155	#B	-5.5798E-03	-5.5933E-03	1.4314E-01	1.4314E-01	1.605E-01
HG-203	#B	5.9357E-03	6.5229E-03	5.3655E-02	5.3656E-02	5.569E-02
TL-208		3.9953E-01	3.9953E-01	9.3650E-02	9.6332E-02	
PB-212	#	8.6895E-01	8.6895E-01	1.5715E-01	1.6464E-01	1.308E-01
PB-214	#	5.4616E-01	5.4616E-01	1.4984E-01	1.5298E-01	1.236E-01
BI-212		5.2531E-01	5.2531E-01	4.2397E-01	4.2501E-01	
BI-214		6.4706E-01	6.4706E-01	1.8676E-01	1.9030E-01	
RA-224	#	1.6674E+00	1.6674E+00	5.4530E-01	5.5338E-01	3.366E-01
RA-226	#	1.4813E+00	1.4813E+00	1.3794E+00	1.3819E+00	1.474E+00
AC-228		9.3324E-01	9.3324E-01	3.0847E-01	3.1294E-01	
TH-227	#B	-2.5129E-01	-2.5129E-01	5.6353E-01	5.6371E-01	6.215E-01
PA-234	#B	-5.5543E-02	-5.5543E-02	1.9544E-01	1.9547E-01	2.170E-01
TH-234	#B	1.5732E+00	1.5732E+00	1.2858E+00	1.2887E+00	2.687E+00
AM-241	#A	4.9116E-02	4.9117E-02	3.2781E-01	3.2782E-01	3.658E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (270.1 to 1999.1 keV) 2.0567530E+01 pCi/gm
Total Decayed Activity (270.1 to 1999.1 keV) 2.0567530E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
VSB

Reviewed by: _____
Supervisor

Laboratory: Yankee Chemistry

Yankee Chemistry Spectrum name: 101F_16NOV2004_2020.An1

Sample description
FSS-OOL-05-01-008-F SOIL

Spectrum Filename: C:\My Documents\FSS_ReanalysisArea\101F_16NOV2004_2020.An1

Acquisition information
Start time: 16-Nov-2004 20:12:49
Live time: 2000
Real time: 2002
Dead time: 0.12 %
Detector ID: 1

Detector system
Det 101- DSPE-633

Calibration
Filename: D1_1LSa.Clb
Detector 101 1.0 Liter Marinelli Sand

Energy Calibration
Created: 03-Sep-2004 08:50:48
Zero offset: 0.244 keV
Gain: 0.500 keV/channel
Quadratic: -2.493E-08 keV/channel^2

Efficiency Calibration
Created: 03-Sep-2004 08:52:26
Type: Polynomial
Uncertainty: 0.626 %
Coefficients: -0.321775 -5.816463 0.734234
-0.099357 0.006049 -0.000149

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.23keV)
Stop channel: 4000 (1999.11keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 1.4100E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.4100E+03) =
7.0922E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00

```
Systematic error:           1.0000000E+00
Fraction Limit:             0.000%
```

Yankee Chemistry Spectrum name: 101F_16NOV2004_2020.An1

Background width: average of five points.
Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	10-Nov-2004 16:03:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	1010K_Background_Det101.Pbc 17-May-2004 16:32:19
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 17 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.1784

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
74.80	198.	24.48	1.50	1.654E-02	70.83	3.520	3.910E+00	HG203
					72.87	6.400	2.046E+00	HG203
					74.81	9.600	1.196E+00	PB212
77.07	358.	13.28	1.50	1.720E-02	77.11	17.500	1.141E+00	PB212
					77.11	10.700	1.866E+00	PB214
77.07	358.	13.28	1.50	1.720E-02	77.11	17.500	1.141E+00	PB212
					77.11	10.700	1.866E+00	PB214
87.16	198.	14.46	1.01	1.921E-02	86.45	32.740	3.049E-01	EU155
					88.04	3.790	2.622E+00	CD109
89.60	126.	21.86	1.02	1.953E-02				
93.15	138.	21.13	1.02	1.993E-02	92.38	2.570	2.592E+00	TH234
					92.80	3.000	2.215E+00	TH234
129.09	81.	31.35	1.17	2.110E-02				
186.03	124.	28.14	1.27	1.858E-02	185.99	3.280	1.947E+00	RA226
209.57	96.	32.22	1.07	1.720E-02				
238.67	840.	3.96	1.12	1.558E-02				
238.67	840.	3.96	1.12	1.558E-02	238.63	43.100	1.200E+00	PB212
241.52	121.	17.99	1.12	1.543E-02	241.00	3.900	1.919E+00	RA224
270.51	85.	29.20	1.13	1.399E-02				
295.17	198.	12.57	1.13	1.292E-02				
295.17	198.	12.57	1.13	1.292E-02	295.22	19.200	7.669E-01	PB214
300.21	77.	27.16	1.14	1.272E-02				
328.51	53.	33.53	1.14	1.168E-02				
338.61	172.	14.56	1.24	1.134E-02	338.40	12.010	1.211E+00	AC228
352.04	286.	10.40	1.25	1.092E-02	351.99	37.100	6.770E-01	PB214
463.24	80.	23.41	1.34	8.346E-03				

463.24	80.	23.41	1.34	8.346E-03	463.51	10.000	9.219E-01	SB125
510.71	121.	15.70	1.24	7.591E-03	510.72	22.500	6.790E-01	TL208
583.15	240.	9.26	1.44	6.684E-03	583.14	86.000	3.998E-01	TL208
609.12	207.	10.29	1.19	6.415E-03	609.32	46.090	6.712E-01	BI214
661.40	245.	9.26	1.33	5.939E-03	661.62	84.620	4.677E-01	CS137
726.19	88.	19.03	1.43	5.450E-03	727.17	11.800	1.313E+00	BI212
795.07	29.	35.32	1.50	5.016E-03	795.76	85.400	PBC<MDA	CS134
860.39	49.	25.38	0.81	4.678E-03				
911.09	128.	10.25	1.03	4.446E-03	911.07	29.000	9.499E-01	AC228

Yankee Chemistry Spectrum name: 101F_16NOV2004_2020.An1

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
968.21	123.	13.69	2.00	4.215E-03	968.90	17.460	1.600E+00	AC228
1119.96	49.	22.40	1.89	3.712E-03	1120.28	15.040	8.380E-01	BI214
1460.66	530.	4.46	1.97	2.943E-03	1460.75	10.700	1.614E+01	K40
1619.04	16.	25.00	1.50	2.682E-03	1620.56	2.750	2.079E+00	BI212
1764.28	35.	16.90	1.67	2.481E-03	1764.51	15.920	8.492E-01	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
178.77	89.65	316.	126.	0.063	65.59	1.015	PB-214	lD
257.79	129.09	274.	101.	0.051	75.55	1.174	AC-228	
418.82	209.57	340.	96.	0.048	96.66	1.069	AC-228	s
477.04	238.58	133.	840.	0.420	11.88	1.122	PB-212	D
540.74	270.51	203.	85.	0.042	87.60	1.126	AC-228	s
600.17	300.21	148.	77.	0.038	75.75	1.144	PB-212	s
656.80	328.51	116.	53.	0.027	100.59	1.137	RH-106M	s
1721.08	860.39	33.	49.	0.024	76.13	0.815	TL-208	s

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
HG-203	146.39	73.41	1053.	-123.	-0.062	114.85	1.499
PB-212	149.17	74.80	1077.	198.	0.099	73.45	1.499s
PB-212	153.79	77.11	953.	358.	0.179	39.83	1.499D
PB-214	153.79	77.11	953.	358.	0.179	39.83	1.499D
CD-109	173.95	87.19	736.	152.	0.076	79.75	1.499
TH-234	185.39	92.90	832.	142.	0.071	90.00	1.499s
TH-234	185.39	92.91	776.	150.	0.075	82.77	1.499s
RA-226	371.70	186.02	440.	105.	0.053	89.35	1.499s
PB-212	477.00	238.65	432.	582.	0.291	19.61	1.499
RA-224	481.70	241.00	376.	124.	0.062	71.43	1.123D
PB-214	590.28	295.27	194.	179.	0.090	39.90	1.499
AC-228	677.00	338.61	158.	172.	0.086	43.69	1.238s
PB-214	703.84	352.02	115.	272.	0.136	24.69	1.499
SB-125	925.65	462.88	76.	57.	0.028	76.21	1.499
TL-208	1021.36	510.71	80.	121.	0.060	47.11	1.241s
TL-208	1166.31	583.15	79.	240.	0.120	27.78	1.442

Yankee Chemistry Spectrum name: 101F_16NOV2004_2020.An1

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
BI-214	1218.28	609.12	77.	207.	0.104	30.86	1.192
CS-137	1322.88	661.40	73.	245.	0.123	27.77	1.334s
BI-212	1452.53	726.19	55.	88.	0.044	57.10	1.432s
CS-134	1590.36	795.07	39.	29.	0.015	105.97	1.502s
AC-228	1822.53	911.09	18.	128.	0.064	30.74	1.026s
AC-228	1936.83	968.21	43.	123.	0.061	41.07	1.996s
BI-214	2240.51	1119.96	27.	49.	0.024	67.21	1.892s
K-40	2922.33	1460.66	8.	530.	0.265	13.37	1.969
BI-212	3239.31	1619.04	0.	16.	0.008	75.00	1.499
BI-214	3530.00	1764.28	0.	35.	0.018	50.71	1.666

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	Peak MDA Value pCi/gm	Peak	COMMENTS
BE-7		-1.0225E-01						
			477.56	-1.022E-01	%(	5.437E-01	1.59E-01	G
K-40		1.6140E+01						
			1460.75	1.614E+01	(	4.787E-01	7.19E-01	G
MN-54		-5.1628E-03						
			834.81	-5.163E-03	%(	6.188E-02	1.74E-02	G
CO-57		-1.0113E-03						
			122.07	-1.011E-03	%(P	5.973E-02	1.77E-02	G K
			136.43	1.214E-01	%	4.772E-01	1.43E-01	G
CO-60		-2.3443E-02						
			1332.51	-2.344E-02	&(P	8.883E-02	2.22E-02	G K
			1173.23	3.523E-03	% P	9.020E-02	2.43E-02	G K
Sr-85		-2.7275E-02						
			514.00	-2.727E-02	%(	8.824E-02	2.64E-02	G
Kr-85		-5.8947E+02						
			513.99	-5.895E+02	%(	1.907E+03	5.70E+02	G
Y-88		1.5959E-03						
			1836.01	1.596E-03	&(P	6.208E-02	1.55E-02	G K
			898.02	6.890E-03	& P	6.105E-02	1.69E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
NB-94	-4.2703E-04						
		871.10	-4.270E-04	%(	6.029E-02	1.66E-02	G K
		702.50	8.058E-03	%	6.096E-02	1.75E-02	G K
Ag-108M	-3.1566E-03						
		722.95	-3.157E-03	&(	8.839E-02	2.54E-02	G K
		614.37	-1.875E-02	%	6.750E-02	1.99E-02	G
		433.93	-6.940E-03	%	6.391E-02	1.86E-02	G
CD-109	2.0027E+00						
		88.04	2.003E+00	(	1.706E+00	5.32E-01	G
SN-113	-1.7513E-02						
		391.71	-1.751E-02	%(P	8.964E-02	2.63E-02	G K
		255.04	4.301E-01	%	2.522E+00	7.48E-01	G
SB-125	2.0123E-01						
		427.95	4.708E-02	%(	1.839E-01	5.44E-02	G K
		600.77	-2.390E-02	%	2.835E-01	8.06E-02	G
		636.15	8.053E-02	%	5.351E-01	1.55E-01	G
		463.51	6.575E-01	(	5.009E-01	1.67E-01	G
		176.29	-1.432E-01	%	8.525E-01	2.54E-01	G
I-131	3.7067E-02						
		364.48	3.707E-02	%(	9.825E-02	2.95E-02	G K
		636.97	2.690E-01	%	1.320E+00	3.84E-01	G
		284.29	-8.947E-02	%	1.462E+00	4.29E-01	G
CS-134	2.9204E-02						
		604.66	-2.758E-03	&(	4.620E-02	1.29E-02	G K
		795.76	6.573E-02	*(	7.127E-02	2.32E-02	G
		569.29	6.072E-02	&	3.217E-01	9.31E-02	G
		801.84	0.000E+00	%	8.634E-01	2.44E-01	G
CS-137	4.6772E-01						
		661.62	4.677E-01	@(	8.110E-02	4.33E-02	G
CE-139	-7.5508E-04						
		165.85	-7.551E-04	%(P	6.644E-02	1.97E-02	G
EU-152	-3.3098E-02						
		121.78	-3.310E-02	&(	1.805E-01	5.40E-02	G K
		344.30	-2.551E-04	%	1.917E-01	5.56E-02	G
		1408.08	7.875E-02	%	2.720E-01	7.82E-02	G
		964.00	4.123E-03	%	4.110E-01	1.12E-01	G
		1112.07	-4.378E-02	&	6.023E-01	1.70E-01	G
		778.90	1.616E-01	%	3.052E-01	9.41E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
EU-154	-1.1939E-03						
		123.10	-1.194E-03	&(	1.321E-01	3.92E-02	G K
		1274.80	1.905E-02	%	2.195E-01	6.12E-02	G
		723.30	-1.881E-03	&	2.755E-01	7.64E-02	G
		1004.80	4.067E-03	%	3.931E-01	1.09E-01	G
EU-155	2.1264E-02						
		86.45	2.126E-02	&(	2.274E-01	6.80E-02	G K
		105.31	8.484E-02	%	2.622E-01	7.90E-02	G
HG-203	-3.1761E-03						
		279.17	-3.176E-03	&(P	7.152E-02	2.07E-02	G K
		72.87	-1.232E-01	%	1.794E+00	5.37E-01	G
		70.83	-2.434E+00	&	3.038E+00	9.32E-01	G
		82.50	-1.242E+00	%	3.560E+00	1.07E+00	G
TL-208	3.9979E-01						
		583.14	3.998E-01	(	7.366E-02	3.70E-02	G
		510.72	6.790E-01	+	2.491E-01	1.07E-01	G
PB-212	8.3073E-01						
		238.63	8.307E-01	(	1.422E-01	5.43E-02	G K
							Energy duplication
		77.11	1.141E+00	+	4.665E-01	1.51E-01	G
		74.81	1.196E+00	+	9.396E-01	2.93E-01	G
PB-214	6.5999E-01						
		351.99	6.434E-01	(	1.244E-01	5.29E-02	G K
		295.22	6.920E-01	(	2.614E-01	9.20E-02	G
							Energy duplication
		77.11	1.866E+00	+	7.630E-01	2.48E-01	G
		241.92	-3.070E-02	%	8.420E-01	2.49E-01	G
BI-212	1.4580E+00						
		727.17	1.313E+00	*(	5.561E-01	2.50E-01	G K
		1620.56	2.079E+00	(	9.578E-01	5.19E-01	G
		785.42	9.441E-01	%	2.655E+00	7.87E-01	G
BI-214	7.4055E-01						
		609.32	6.712E-01	(	1.414E-01	6.90E-02	G K
		1764.51	8.492E-01	(	1.788E-01	1.44E-01	G
		1120.28	8.380E-01	(	4.639E-01	1.88E-01	G
RA-224	1.9771E+00						
		241.00	1.977E+00	(	1.480E+00	4.71E-01	G
RA-226	1.6571E+00						
		185.99	1.657E+00	*(	1.579E+00	4.94E-01	G

Yankee Chemistry Spectrum name: 101F_16NOV2004_2020.An1

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
AC-228	1.0265E+00						
		911.07	9.499E-01	(	1.679E-01	9.73E-02	G K
		968.90	1.600E+00	+	4.345E-01	2.19E-01	G
		338.40	1.211E+00	@(	4.305E-01	1.76E-01	G
TH-227	-1.3149E-01						
		236.00	-1.315E-01	%(	6.380E-01	1.91E-01	G K
		256.25	4.644E-02	&	7.486E-01	2.20E-01	G
PA-234	-8.3970E-02						
		98.44	-8.397E-02	%(	2.271E-01	6.85E-02	G K
		946.00	-8.995E-04	%	3.195E-01	8.79E-02	G
		131.28	-7.654E-02	%	2.832E-01	8.51E-02	G
		94.67	-1.391E-01	%	4.243E-01	1.28E-01	G
		883.24	-9.465E-04	%	4.645E-01	1.27E-01	G
		926.70	6.897E-02	&	5.836E-01	1.65E-01	G
		569.26	8.958E-02	&	4.745E-01	1.37E-01	G
TH-234	2.2036E+00						
		63.29	1.750E+00	%(	2.841E+00	8.66E-01	G K
		92.80	2.401E+00	(	2.128E+00	6.63E-01	G
		92.38	2.662E+00	*(	2.577E+00	7.99E-01	G
AM-241	4.0784E-03						
		59.54	4.078E-03	%(P	3.870E-01	1.15E-01	G

(- This peak used in the nuclide activity average.

* - Peak is too wide, but only one peak in library.
! - Peak is part of a multiplet and this area went negative during deconvolution.
? - Peak is too narrow.
@ - Peak is too wide at FW25M, but ok at FWHM.
% - Peak fails sensitivity test.
$ - Peak identified, but first peak of this nuclide failed one or more qualification tests.
\+ - Peak activity higher than counting uncertainty range.
\- - Peak activity lower than counting uncertainty range.
= - Peak outside analysis energy range.
& - Calculated peak centroid is not close enough to the library energy centroid for positive identification.
P - Peakbackground subtraction
} - Peak is too close to another for the activity to be found directly.

Nuclide Codes:	Peak Codes:
T - Thermal Neutron Activation	G - Gamma Ray
F - Fast Neutron Activation	X - X-Ray

I - Fission Product
N - Naturally Occurring Isotope
P - Photon Reaction
C - Charged Particle Reaction
M - No MDA Calculation
R - Coincidence Corrected
H - Halflife limit exceeded

P - Positron Decay
S - Single-Escape
D - Double-Escape
K - Key Line
A - Not in Average
C - Coincidence Peak

- -

***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	-9.4373E-02	-1.0225E-01	4.7645E-01	4.7649E-01	5.018E-01
K-40		1.6140E+01	1.6140E+01	2.1578E+00	2.3425E+00	
MN-54	#A	-5.0925E-03	-5.1628E-03	5.2256E-02	5.2257E-02	6.104E-02
CO-57	#B	-9.9538E-04	-1.0113E-03	3.0273E-01	3.0273E-01	5.879E-02
CO-60	#B	-2.3391E-02	-2.3443E-02	7.2496E-01	7.2496E-01	8.863E-02
Sr-85	#A	-2.5533E-02	-2.7275E-02	7.9118E-02	7.9133E-02	8.261E-02
Kr-85	#A	-5.8945E+02	-5.8947E+02	1.7099E+03	1.7102E+03	1.907E+03
Y-88	#B	1.5331E-03	1.5959E-03	4.6392E-02	4.6392E-02	5.964E-02
NB-94	#B	-4.2703E-04	-4.2703E-04	4.9858E-02	4.9858E-02	6.029E-02
Ag-108M	#B	-3.1563E-03	-3.1566E-03	7.6064E-02	7.6064E-02	8.839E-02
CD-109	#	1.9839E+00	2.0027E+00	1.5971E+00	1.6009E+00	1.690E+00
SN-113	#B	-1.6874E-02	-1.7513E-02	9.7868E-02	9.7873E-02	8.637E-02
SB-125	#F	2.0038E-01	2.0123E-01	1.5336E-01	1.5378E-01	1.831E-01
I-131	#B	2.1769E-02	3.7067E-02	8.8426E-02	8.8450E-02	5.770E-02
CS-134	#B	2.9038E-02	2.9204E-02	3.0948E-02	3.0992E-02	4.593E-02
CS-137	#	4.6754E-01	4.6772E-01	1.2990E-01	1.3256E-01	
CE-139	#A	-7.3194E-04	-7.5508E-04	7.4480E-02	7.4480E-02	6.441E-02
EU-152	#B	-3.3067E-02	-3.3098E-02	1.6195E-01	1.6196E-01	1.803E-01
EU-154	#B	-1.1923E-03	-1.1939E-03	1.1753E-01	1.1753E-01	1.319E-01
EU-155	#B	2.1214E-02	2.1264E-02	2.0400E-01	2.0401E-01	2.269E-01
HG-203	#B	-2.8974E-03	-3.1761E-03	3.0068E-01	3.0068E-01	6.525E-02
TL-208		3.9979E-01	3.9979E-01	1.1108E-01	1.1335E-01	
PB-212	#	8.3073E-01	8.3073E-01	1.6288E-01	1.6950E-01	1.422E-01
PB-214	#	6.5999E-01	6.5999E-01	1.5484E-01	1.5927E-01	1.244E-01
BI-212		1.4580E+00	1.4580E+00	6.8713E-01	6.9206E-01	
BI-214		7.4055E-01	7.4055E-01	2.2135E-01	2.2527E-01	
RA-224		1.9771E+00	1.9771E+00	1.4122E+00	1.4166E+00	
RA-226	#	1.6571E+00	1.6571E+00	1.4807E+00	1.4836E+00	1.579E+00
AC-228		1.0265E+00	1.0265E+00	2.7417E-01	2.8024E-01	
TH-227	#B	-1.3149E-01	-1.3149E-01	5.7307E-01	5.7311E-01	6.380E-01
PA-234	#B	-8.3970E-02	-8.3970E-02	2.0560E-01	2.0566E-01	2.271E-01
TH-234	#B	2.2036E+00	2.2036E+00	1.4133E+00	1.4186E+00	2.841E+00
AM-241	#A	4.0782E-03	4.0784E-03	3.4482E-01	3.4482E-01	3.870E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (270.1 to 1999.1 keV) 2.2209095E+01 pCi/gm
Total Decayed Activity (270.1 to 1999.1 keV) 2.2209274E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
VSB

Reviewed by: _____
Supervisor

Laboratory: Yankee Chemistry

Yankee Chemistry Spectrum name: 101F_17NOV2004_0635.An1

Sample description
FSS-OOL-05-01-005-F SOIL

Spectrum Filename: C:\My Documents\FSS_ReanalysisArea\101F_17NOV2004_0635.An1

Acquisition information
Start time: 17-Nov-2004 06:37:00
Live time: 2000
Real time: 2002
Dead time: 0.11 %
Detector ID: 1

Detector system
Det 101- DSPE-633

Calibration
Filename: D1_1LSa.Clb
Detector 101 1.0 Liter Marinelli Sand

Energy Calibration
Created: 03-Sep-2004 08:50:48
Zero offset: 0.244 keV
Gain: 0.500 keV/channel
Quadratic: -2.493E-08 keV/channel^2

Efficiency Calibration
Created: 03-Sep-2004 08:52:26
Type: Polynomial
Uncertainty: 0.626 %
Coefficients: -0.321775 -5.816463 0.734234
-0.099357 0.006049 -0.000149

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.23keV)
Stop channel: 4000 (1999.11keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 1.3120E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.3120E+03) =
7.6220E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00

```
Systematic error:           1.0000000E+00
Fraction Limit:             0.000%
```

Yankee Chemistry Spectrum name: 101F_17NOV2004_0635.An1

Background width: average of five points.
Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	10-Nov-2004 11:10:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	1010K_Background_Det101.Pbc 17-May-2004 16:32:19
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 15 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.1861

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
74.85	194.	21.24	1.50	1.654E-02				
74.85	194.	21.24	1.50	1.654E-02	74.81	9.600	1.258E+00	PB212
77.07	277.	14.44	1.50	1.720E-02	77.11	10.700	1.552E+00	PB214
					77.11	17.500	9.491E-01	PB212
77.07	277.	14.44	1.50	1.720E-02	77.11	10.700	1.552E+00	PB214
					77.11	17.500	9.491E-01	PB212
93.02	119.	31.39	1.50	1.989E-02	88.04	3.790	PBC<MDA	CD109
					92.38	2.570	2.412E+00	TH234
					92.80	3.000	2.062E+00	TH234
93.03	118.	32.19	1.50	1.985E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	2.038E+00	TH234
186.28	97.	23.08	1.25	1.857E-02	185.99	3.280	1.639E+00	RA226
209.11	55.	33.08	0.81	1.723E-02				
238.74	649.	4.51	1.12	1.557E-02	238.63	43.100	9.961E-01	PB212
241.72	88.	22.61	1.12	1.541E-02	241.00	3.900	1.508E+00	RA224
270.25	66.	32.54	1.19	1.400E-02				
277.14	36.	38.35	1.11	1.369E-02				
288.45	56.	33.34	1.12	1.320E-02				
295.35	170.	10.08	1.16	1.292E-02	295.22	19.200	7.049E-01	PB214
300.21	39.	31.36	1.16	1.272E-02				
338.26	115.	18.46	1.09	1.135E-02	338.40	12.010	8.682E-01	AC228
351.89	206.	11.86	0.90	1.093E-02				
351.89	206.	11.86	0.90	1.093E-02	351.99	37.100	5.235E-01	PB214
463.21	44.	28.76	0.74	8.347E-03				
463.21	44.	28.76	0.74	8.347E-03	463.51	10.000	5.409E-01	SB125
511.25	106.	16.61	1.57	7.583E-03	510.72	22.500	6.393E-01	TL208

583.14	189.	8.74	1.27	6.684E-03	583.14	86.000	3.386E-01	TL208
609.41	179.	11.42	1.08	6.412E-03	609.32	46.090	6.245E-01	BI214
661.56	74.	23.13	1.02	5.938E-03	661.62	84.620	1.522E-01	CS137
726.82	63.	17.56	1.72	5.445E-03	727.17	11.800	1.017E+00	BI212
795.16	31.	27.92	1.50	5.016E-03	795.76	85.400	7.568E-02	CS134
911.19	113.	15.73	1.10	4.446E-03	911.07	29.000	9.010E-01	AC228
968.16	105.	14.61	1.42	4.215E-03	968.90	17.460	1.469E+00	AC228

Yankee Chemistry Spectrum name: 101F_17NOV2004_0635.An1

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
1120.58	53.	26.21	1.32	3.710E-03	1120.28	15.040	9.781E-01	BI214
1460.64	492.	4.63	1.97	2.943E-03	1460.75	10.700	1.611E+01	K40
1621.91	14.	34.30	0.61	2.682E-03	1620.56	2.750	1.899E+00	BI212
1763.91	22.	21.32	2.17	2.481E-03	1764.51	15.920	5.736E-01	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
417.90	209.11	148.	55.	0.028	99.24	0.809	AC-228	
477.18	238.73	103.	649.	0.325	13.52	1.122	PB-212	D
483.13	241.71	155.	88.	0.044	67.83	1.124	PB-214	D
540.23	270.25	152.	66.	0.033	97.62	1.185	AC-228	s
554.02	277.14	77.	41.	0.021	100.88	1.112	TL-208	
576.64	288.45	117.	56.	0.028	91.48	1.124	J-135	
600.12	300.18	72.	39.	0.020	104.06	0.894	PB-212	s

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-212	149.27	74.85	751.	194.	0.097	63.71	1.499
PB-214	153.79	77.11	664.	277.	0.139	43.32	1.499D
PB-212	153.79	77.11	664.	277.	0.139	43.32	1.499D
TH-234	185.64	93.03	663.	118.	0.059	96.56	1.499s
TH-234	185.62	93.02	643.	119.	0.060	94.16	1.499
RA-226	371.62	185.98	310.	113.	0.057	71.80	1.499
PB-212	477.17	238.74	274.	536.	0.268	18.42	1.499
PB-214	590.37	295.31	129.	150.	0.075	40.51	1.499
AC-228	676.30	338.26	124.	115.	0.057	55.39	1.088
PB-214	703.66	351.93	86.	176.	0.088	31.79	1.499
SB-125	926.08	463.09	61.	38.	0.019	99.21	1.499s
TL-208	1022.43	511.25	60.	106.	0.053	49.83	1.574s
TL-208	1166.29	583.14	35.	189.	0.094	26.23	1.274s
BI-214	1218.85	609.41	75.	179.	0.090	34.25	1.079
CS-137	1323.20	661.56	65.	74.	0.037	69.39	1.021
BI-212	1453.79	726.82	22.	63.	0.032	52.67	1.725s
CS-134	1590.54	795.16	22.	31.	0.016	83.76	1.502s
AC-228	1822.73	911.19	53.	113.	0.056	47.20	1.097

Yankee Chemistry Spectrum name: 101F_17NOV2004_0635.An1

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
AC-228	1936.72	968.16	35.	105.	0.052	43.82	1.419s
BI-214	2241.76	1120.58	40.	53.	0.026	78.64	1.325
K-40	2922.30	1460.64	7.	492.	0.246	13.90	1.974
BI-212	3245.06	1621.91	2.	14.	0.007	102.90	0.605s
BI-214	3529.26	1763.91	0.	22.	0.011	63.96	2.165

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	Peak MDA Value pCi/gm	COMMENTS
BE-7		-1.0868E-01					
			477.56	-1.087E-01	%(	5.660E-01 1.65E-01 G	
K-40		1.6109E+01					
			1460.75	1.611E+01	(	4.803E-01 7.47E-01 G	
MN-54		1.1181E-03					
			834.81	1.118E-03	%(	7.096E-02 1.98E-02 G	
CO-57		1.3822E-02					
			122.07	1.382E-02	&(P	6.292E-02 1.88E-02 G K	
			136.43	-5.025E-03	&	5.250E-01 1.56E-01 G	
CO-60		-5.0612E-03					
			1332.51	-5.061E-03	%(P	7.961E-02 1.94E-02 G K	
			1173.23	4.262E-02	% P	9.106E-02 2.65E-02 G K	
Sr-85		-1.4878E-02					
			514.00	-1.488E-02	%(	8.028E-02 2.36E-02 G	
Kr-85		-3.1935E+02					
			513.99	-3.194E+02	%(	1.723E+03 5.07E+02 G	
Y-88		6.3098E-03					
			1836.01	6.310E-03	&(P	6.458E-02 1.66E-02 G K	
			898.02	2.060E-02	% P	5.755E-02 1.68E-02 G	
NB-94		1.1132E-04					
			871.10	1.113E-04	&(	6.525E-02 1.80E-02 G K	
			702.50	2.611E-02	%	4.835E-02 1.49E-02 G K	

Yankee Chemistry Spectrum name: 101F_17NOV2004_0635.An1

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
Ag-108M	-6.5228E-03						
		722.95	-6.523E-03	%(	6.227E-02	1.76E-02	G K
		614.37	9.235E-04	%	6.639E-02	1.87E-02	G
		433.93	9.296E-03	&	4.418E-02	1.28E-02	G
CD-109	1.3870E-01						
		88.04	1.387E-01	%(	1.563E+00	4.65E-01	G
SN-113	1.0124E-02						
		391.71	1.012E-02	%(P	8.471E-02	2.46E-02	G K
		255.04	4.282E-01	&	2.522E+00	7.47E-01	G
SB-125	1.5073E-01						
		427.95	4.141E-02	%(	1.533E-01	4.51E-02	G K
		600.77	5.909E-02	%	3.306E-01	9.59E-02	G
		636.15	8.503E-02	&	4.481E-01	1.29E-01	G
		463.51	4.743E-01	@(	4.845E-01	1.57E-01	G
		176.29	-1.572E-01	%	7.946E-01	2.37E-01	G
I-131	-7.5930E-04						
		364.48	-7.593E-04	%(	1.101E-01	3.17E-02	G K
		636.97	-1.250E-02	&	1.138E+00	3.12E-01	G
		284.29	5.535E-01	&	1.033E+00	3.15E-01	G
CS-134	3.5354E-02						
		604.66	7.234E-05	%(	8.268E-02	2.37E-02	G K
		795.76	7.568E-02	(	6.003E-02	2.11E-02	G
		569.29	3.735E-02	%	4.039E-01	1.16E-01	G
		801.84	0.000E+00	%	7.469E-01	2.07E-01	G
CS-137	1.5218E-01						
		661.62	1.522E-01	(	8.249E-02	3.52E-02	G
CE-139	8.8101E-03						
		165.85	8.810E-03	&(P	6.309E-02	1.87E-02	G
EU-152	2.4524E-02						
		121.78	2.452E-02	&(	1.814E-01	5.41E-02	G K
		344.30	2.244E-03	%	1.780E-01	5.13E-02	G
		1408.08	4.901E-02	%	2.803E-01	7.72E-02	G
		964.00	-1.511E-02	%	5.492E-01	1.54E-01	G
		1112.07	9.377E-02	%	6.496E-01	1.86E-01	G
		778.90	1.451E-01	%	3.682E-01	1.10E-01	G
EU-154	3.5710E-02						
		123.10	3.571E-02	%(	1.327E-01	3.98E-02	G K
		1274.80	-3.390E-03	%	2.275E-01	6.21E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
		723.30	-6.997E-02	%	3.259E-01	9.46E-02	G
		1004.80	2.132E-02	%	3.748E-01	1.03E-01	G
EU-155	1.2308E-02						
		86.45	1.231E-02	%(	2.162E-01	6.44E-02	G K
		105.31	8.602E-02	%	2.393E-01	7.21E-02	G
HG-203	-1.4620E-02						
		279.17	-1.462E-02	&(P	6.756E-02	1.96E-02	G K
		72.87	-7.483E-01	%	1.572E+00	4.77E-01	G
		70.83	-8.996E-01	&	2.964E+00	8.93E-01	G
		82.50	-5.880E-02	%	3.629E+00	1.08E+00	G
TL-208	3.3863E-01						
		583.14	3.386E-01	@(	5.425E-02	2.96E-02	G
		510.72	6.393E-01	+	2.340E-01	1.06E-01	G
PB-212	8.5936E-01						
		238.63	8.229E-01	(	1.226E-01	5.05E-02	G K
							Energy duplication
		77.11	9.491E-01	@(	4.200E-01	1.37E-01	G
		74.81	1.258E+00	&	8.460E-01	2.67E-01	G
PB-214	4.4756E-01						
		351.99	4.476E-01	(	1.168E-01	4.74E-02	G K
		295.22	6.212E-01	+	2.313E-01	8.39E-02	G
							Energy duplication
		77.11	1.552E+00	+	6.869E-01	2.24E-01	G
		241.92	-3.704E-01	%	9.532E-01	2.88E-01	G
BI-212	1.0167E+00						
		727.17	1.017E+00	*(	3.908E-01	1.78E-01	G K
		1620.56	1.899E+00	+	1.387E+00	6.52E-01	G
		785.42	6.638E-01	%	2.645E+00	7.65E-01	G
BI-214	6.1143E-01						
		609.32	6.245E-01	(	1.499E-01	7.13E-02	G K
		1764.51	5.736E-01	(	1.922E-01	1.22E-01	G
		1120.28	9.781E-01	+	5.939E-01	2.56E-01	G
RA-224	1.1277E+00						
		241.00	1.128E+00	%(	1.561E+00	4.80E-01	G
RA-226	1.9117E+00						
		185.99	1.912E+00	(	1.432E+00	4.58E-01	G
AC-228	8.9140E-01						
		911.07	9.010E-01	(	2.931E-01	1.42E-01	G K
		968.90	1.469E+00	+	4.246E-01	2.14E-01	G
		338.40	8.682E-01	(	4.127E-01	1.60E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TH-227	-3.3932E-01						
		236.00	-3.393E-01	%(	6.186E-01	1.88E-01	G K
		256.25	1.194E-01	%	7.525E-01	2.23E-01	G
PA-234	-1.4607E-02						
		98.44	-1.461E-02	%(	2.193E-01	6.51E-02	G K
		946.00	-9.897E-03	%	3.356E-01	9.26E-02	G
		131.28	9.294E-03	&	2.610E-01	7.74E-02	G
		94.67	-1.366E-01	&	4.165E-01	1.25E-01	G
		883.24	1.146E-01	%	5.385E-01	1.55E-01	G
		926.70	-1.001E-01	%	6.259E-01	1.78E-01	G
		569.26	5.505E-02	%	5.955E-01	1.71E-01	G
TH-234	1.7209E+00						
		63.29	1.021E+00	%(	2.726E+00	8.23E-01	G K
		92.80	2.062E+00	(	2.087E+00	6.47E-01	G
		92.38	2.384E+00	&(	2.478E+00	7.67E-01	G
AM-241	1.7820E-02						
		59.54	1.782E-02	&(P	3.916E-01	1.16E-01	G

(- This peak used in the nuclide activity average.

* - Peak is too wide, but only one peak in library.
! - Peak is part of a multiplet and this area went negative during deconvolution.
? - Peak is too narrow.
@ - Peak is too wide at FW25M, but ok at FWHM.
% - Peak fails sensitivity test.
$ - Peak identified, but first peak of this nuclide failed one or more qualification tests.
\+ - Peak activity higher than counting uncertainty range.
\- - Peak activity lower than counting uncertainty range.
= - Peak outside analysis energy range.
& - Calculated peak centroid is not close enough to the library energy centroid for positive identification.
P - Peakbackground subtraction
} - Peak is too close to another for the activity to be found directly.

Nuclide Codes:	Peak Codes:
T - Thermal Neutron Activation	G - Gamma Ray
F - Fast Neutron Activation	X - X-Ray
I - Fission Product	P - Positron Decay
N - Naturally Occurring Isotope	S - Single-Escape
P - Photon Reaction	D - Double-Escape
C - Charged Particle Reaction	K - Key Line
M - No MDA Calculation	A - Not in Average

R - Coincidence Corrected C - Coincidence Peak
H - Halflife limit exceeded

- -

***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	-9.9487E-02	-1.0868E-01	4.9553E-01	4.9557E-01	5.181E-01
K-40		1.6109E+01	1.6109E+01	2.2397E+00	2.4176E+00	
MN-54	#A	1.1013E-03	1.1181E-03	5.9419E-02	5.9419E-02	6.989E-02
CO-57	#B	1.3583E-02	1.3822E-02	5.6460E-02	5.6465E-02	6.183E-02
CO-60	#B	-5.0488E-03	-5.0612E-03	9.5461E-02	9.5461E-02	7.941E-02
Sr-85	#A	-1.3833E-02	-1.4878E-02	7.0852E-02	7.0857E-02	7.464E-02
Kr-85	#A	-3.1934E+02	-3.1935E+02	1.5209E+03	1.5210E+03	1.723E+03
Y-88	#B	6.0365E-03	6.3098E-03	4.9791E-02	4.9792E-02	6.178E-02
NB-94	#B	1.1132E-04	1.1132E-04	5.3931E-02	5.3931E-02	6.525E-02
Ag-108M	#B	-6.5221E-03	-6.5228E-03	5.2728E-02	5.2730E-02	6.226E-02
CD-109	#A	1.3727E-01	1.3870E-01	1.3943E+00	1.3943E+00	1.547E+00
SN-113	#B	9.7173E-03	1.0124E-02	7.3770E-02	7.3772E-02	8.130E-02
SB-125	#B	1.5003E-01	1.5073E-01	1.4954E-01	1.4978E-01	1.525E-01
I-131	#B	-4.2211E-04	-7.5930E-04	9.5028E-02	9.5028E-02	6.123E-02
CS-134	#B	3.5133E-02	3.5354E-02	2.9614E-02	2.9681E-02	8.216E-02
CS-137		1.5211E-01	1.5218E-01	1.0559E-01	1.0594E-01	
CE-139	#A	8.5127E-03	8.8101E-03	5.6243E-02	5.6246E-02	6.096E-02
EU-152	#B	2.4499E-02	2.4524E-02	1.6219E-01	1.6219E-01	1.812E-01
EU-154	#B	3.5656E-02	3.5710E-02	1.1943E-01	1.1945E-01	1.324E-01
EU-155	#B	1.2276E-02	1.2308E-02	1.9325E-01	1.9326E-01	2.157E-01
HG-203	#B	-1.3211E-02	-1.4620E-02	1.2476E-01	1.2476E-01	6.105E-02
TL-208	#	3.3863E-01	3.3863E-01	8.8812E-02	9.0850E-02	
PB-212	#	8.5936E-01	8.5936E-01	1.5832E-01	1.6560E-01	1.226E-01
PB-214	#	4.4756E-01	4.4756E-01	1.4230E-01	1.4453E-01	1.168E-01
BI-212		1.0167E+00	1.0167E+00	5.3548E-01	5.3855E-01	
BI-214		6.1143E-01	6.1143E-01	2.0942E-01	2.1225E-01	
RA-224	#A	1.1277E+00	1.1277E+00	1.4405E+00	1.4419E+00	1.561E+00
RA-226	#	1.9117E+00	1.9117E+00	1.3726E+00	1.3768E+00	1.432E+00
AC-228		8.9140E-01	8.9140E-01	3.2433E-01	3.2822E-01	
TH-227	#B	-3.3932E-01	-3.3932E-01	5.6482E-01	5.6515E-01	6.186E-01
PA-234	#B	-1.4607E-02	-1.4607E-02	1.9534E-01	1.9534E-01	2.193E-01
TH-234	#B	1.7209E+00	1.7209E+00	1.5874E+00	1.5903E+00	2.726E+00
AM-241	#A	1.7820E-02	1.7820E-02	3.4910E-01	3.4911E-01	3.916E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.

H - Halflife limit exceeded

Yankee Chemistry Spectrum name: 101F_17NOV2004_0635.An1

---------- S U M M A R Y ----------

Total Activity (270.1 to 1999.1 keV) 1.9118921E+01 pCi/gm
Total Decayed Activity (270.1 to 1999.1 keV) 1.9118986E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
VSB

Reviewed by: _____
Supervisor

Laboratory: Yankee Chemistry

Yankee Chemistry Spectrum name: 101F_17NOV2004_1600.An1

Sample description
FSS-OOL-05-01-012-F SOIL

Spectrum Filename: C:\My Documents\FSS_ReanalysisArea\101F_17NOV2004_1600.An1

Acquisition information

Start time:	17-Nov-2004 15:51:38
Live time:	2000
Real time:	2003
Dead time:	0.16 %
Detector ID:	1

Detector system
Det 101- DSPE-633

Calibration

Filename:	D1_1LSa.Clb

Detector 101 1.0 Liter Marinelli Sand

Energy Calibration

Created:	03-Sep-2004 08:50:48
Zero offset:	0.244 keV
Gain:	0.500 keV/channel
Quadratic:	-2.493E-08 keV/channel^2

Efficiency Calibration

Created:	03-Sep-2004 08:52:26
Type:	Polynomial
Uncertainty:	0.626 %
Coefficients:	-0.321775 -5.816463 0.734234
	-0.099357 0.006049 -0.000149

Library Files

Main analysis library:	FSS_Rev_1.Lib
Library Match Width:	1.000
Peak stripping:	Library based

Analysis parameters

Analysis engine:	Env32 G53W4.20
Start channel:	100 (50.23keV)
Stop channel:	4000 (1999.11keV)
Peak rejection level:	41.667%
Peak search sensitivity:	3
Sample Size:	8.3800E+02
Activity scaling factor:	1.0000E+06/(1.0000E+00* 8.3800E+02) = 1.1933E+03
Detection limit method:	Nureg 4.16
Random error:	1.0000000E+00

```
Systematic error:           1.0000000E+00
Fraction Limit:             0.000%
```

Yankee Chemistry Spectrum name: 101F_17NOV2004_1600.An1

Background width: average of five points.
Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	10-Nov-2004 14:10:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	1010K_Background_Det101.Pbc 17-May-2004 16:32:19
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 28 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.1771

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
66.83	129.	29.20	1.50	1.512E-02	70.83	3.520	4.352E+00	HG203
74.32	401.	11.41	1.00	1.651E-02	74.81	9.600	4.073E+00	PB212
77.28	962.	4.64	1.01	1.735E-02	77.11	17.500	5.153E+00	PB212
					77.11	10.700	8.428E+00	PB214
84.10	111.	29.67	1.01	1.870E-02				
87.13	367.	9.77	1.01	1.918E-02	86.45	32.740	9.494E-01	EU155
					88.04	3.790	8.170E+00	CD109
89.95	244.	13.65	1.02	1.956E-02				
89.95	244.	13.65	1.02	1.956E-02	92.38	2.570	7.725E+00	TH234
93.40	238.	13.86	1.02	1.995E-02	92.80	3.000	6.419E+00	TH234
129.42	139.	27.73	0.88	2.109E-02				
185.98	165.	20.62	1.39	1.858E-02	185.99	3.280	4.376E+00	RA226
209.31	163.	18.80	0.97	1.721E-02				
238.74	2020.	2.46	1.12	1.557E-02	238.63	43.100	4.853E+00	PB212
241.61	191.	15.21	1.12	1.542E-02	241.00	3.900	5.115E+00	RA224
					241.92	7.470	2.679E+00	PB214
270.19	207.	15.87	1.67	1.401E-02				
277.41	96.	26.84	0.98	1.368E-02				
295.36	251.	8.93	1.16	1.291E-02	295.22	19.200	1.629E+00	PB214
300.25	131.	14.53	1.16	1.272E-02				
328.07	106.	21.60	0.92	1.169E-02				
338.38	352.	9.73	1.23	1.135E-02	338.40	12.010	4.163E+00	AC228
351.96	508.	6.95	1.18	1.093E-02	351.99	37.100	2.023E+00	PB214
409.56	49.	34.35	1.68	9.418E-03				
463.17	117.	19.15	1.11	8.348E-03				
463.17	117.	19.15	1.11	8.348E-03	463.51	10.000	2.281E+00	SB125

510.62	256.	10.90	1.35	7.592E-03	510.72	22.500	2.421E+00	TL208
583.24	571.	5.11	1.26	6.683E-03	583.14	86.000	1.602E+00	TL208
609.31	338.	7.62	1.31	6.413E-03	609.32	46.090	1.844E+00	BI214
661.73	248.	10.85	1.25	5.937E-03	661.62	84.620	7.976E-01	CS137
727.29	118.	12.96	1.28	5.442E-03	727.17	11.800	2.970E+00	BI212
795.33	76.	22.46	1.72	5.018E-03				
795.33	76.	22.46	1.72	5.018E-03	795.76	85.400	2.899E-01	CS134
860.60	81.	17.74	1.59	4.677E-03				
911.19	306.	6.17	1.74	4.446E-03	911.07	29.000	3.827E+00	AC228
964.69	68.	14.63	1.61	4.229E-03	964.00	14.580	1.783E+00	EU152
968.97	163.	8.39	1.62	4.212E-03	968.90	17.460	3.582E+00	AC228

Yankee Chemistry Spectrum name: 101F_17NOV2004_1600.An1

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
1120.25	82.	19.51	1.28	3.711E-03	1120.28	15.040	2.372E+00	BI214
1460.66	398.	5.47	1.67	2.943E-03	1460.75	10.700	2.041E+01	K40
1619.85	18.	38.83	1.34	2.682E-03	1620.56	2.750	4.023E+00	BI212
1764.49	75.	12.85	2.13	2.481E-03	1764.51	15.920	3.070E+00	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
178.74	89.88	550.	153.	0.076	69.56	1.015	PB-214	D
258.45	129.42	620.	135.	0.068	82.30	0.884	AC-228	s
418.30	209.31	367.	163.	0.081	56.39	0.974	AC-228	
540.10	270.19	323.	207.	0.104	47.61	1.671	AC-228	s
554.56	277.41	253.	90.	0.045	81.60	0.978	TL-208	s
600.22	300.24	154.	122.	0.061	51.90	1.249	PB-212	
655.92	328.07	188.	106.	0.053	64.79	0.922	AC-228	s
818.97	409.56	111.	49.	0.024	103.06	1.680	AC-228	s
1721.50	860.60	44.	81.	0.041	53.22	1.593	TL-208	s
1929.72	964.58	18.	63.	0.031	47.48	1.613	AC-228	D

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
HG-203	133.23	66.83	648.	129.	0.065	87.60	1.499
HG-203	144.65	72.54	2172.	-164.	-0.082	122.73	1.499s
PB-212	149.19	74.81	575.	574.	0.287	21.69	1.005D
PB-212	153.79	77.11	634.	832.	0.416	16.14	1.006A
PB-214	153.79	77.11	1391.	231.	0.115	5.66	1.499A
CD-109	175.66	88.04	626.	198.	0.099	57.56	1.014D
TH-234	186.16	93.29	1195.	220.	0.110	69.69	1.499
RA-226	371.61	185.98	454.	165.	0.083	61.86	1.390s
PB-212	476.96	238.63	224.	2020.	1.010	7.38	1.122D
RA-224	481.70	241.00	957.	129.	0.065	107.18	1.123D
PB-214	483.54	241.92	318.	144.	0.072	39.97	1.124A
PB-214	590.44	295.35	166.	236.	0.118	30.75	1.149
AC-228	676.54	338.38	283.	352.	0.176	29.20	1.228
PB-214	703.72	351.96	255.	508.	0.254	20.84	1.183
SB-125	926.15	463.13	127.	103.	0.051	55.22	1.499

Yankee Chemistry Spectrum name: 101F_17NOV2004_1600.An1

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
TL-208	1021.17	510.62	146.	256.	0.128	32.69	1.354s
TL-208	1166.49	583.24	97.	571.	0.286	15.33	1.265
BI-214	1218.65	609.31	105.	338.	0.169	22.86	1.308
CS-137	1323.55	661.73	133.	248.	0.124	32.54	1.253
BI-212	1454.74	727.29	51.	118.	0.059	38.87	1.280
CS-134	1590.02	794.90	43.	55.	0.028	64.48	1.502
AC-228	1822.73	911.19	21.	306.	0.153	18.51	1.738
AC-228	1938.21	968.90	16.	163.	0.082	25.72	1.616D
BI-214	2241.09	1120.25	53.	82.	0.041	58.54	1.284
K-40	2922.34	1460.66	16.	398.	0.199	16.41	1.667
BI-212	3240.93	1619.85	10.	18.	0.009	116.48	1.336s
BI-214	3530.41	1764.49	4.	75.	0.038	38.56	2.133s

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	MDA Value pCi/gm	COMMENTS
BE-7		2.6790E-01					
			477.56	2.679E-01	%(	1.017E+00 3.01E-01	G
K-40		2.0406E+01					
			1460.75	2.041E+01	(	1.082E+00 1.12E+00	G
MN-54		-1.8039E-02					
			834.81	-1.804E-02	%(	1.404E-01 4.06E-02	G
CO-57		2.2536E-02					
			122.07	2.254E-02	%(P	1.282E-01 3.84E-02	G K
			136.43	1.917E-01	%	1.049E+00 3.15E-01	G
CO-60		1.9164E-02					
			1332.51	1.916E-02	%(P	1.278E-01 3.36E-02	G K
			1173.23	5.657E-02	% P	1.390E-01 3.99E-02	G K
Sr-85		-8.5002E-02					
			514.00	-8.500E-02	%(	1.743E-01 5.29E-02	G
Kr-85		-1.8211E+03					
			513.99	-1.821E+03	%(	3.732E+03 1.13E+03	G
Y-88		-1.7528E-03					
			1836.01	-1.753E-03	&(P	1.596E-01 4.23E-02	G K
			898.02	2.784E-02	% P	9.294E-02 2.68E-02	G

Yankee Chemistry Spectrum name: 101F_17NOV2004_1600.An1

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
NB-94	3.8407E-03						
		871.10	3.841E-03	&(	1.204E-01	3.39E-02	G K
		702.50	-3.660E-04	&	1.150E-01	3.26E-02	G K
Ag-108M	-7.0417E-02						
		722.95	-7.042E-02	%(	1.795E-01	5.40E-02	G K
		614.37	3.353E-02	%	1.063E-01	3.15E-02	G
		433.93	-1.719E-02	%	1.257E-01	3.70E-02	G
CD-109	4.4166E+00						
		88.04	4.417E+00	(	2.655E+00	8.47E-01	G
SN-113	-3.9440E-03						
		391.71	-3.944E-03	&(P	1.947E-01	5.68E-02	G K
		255.04	1.561E+00	%	4.295E+00	1.29E+00	G
SB-125	5.3975E-01						
		427.95	4.824E-02	&(	3.851E-01	1.13E-01	G K
		600.77	1.845E-01	&	6.758E-01	2.00E-01	G
		636.15	-3.336E-01	%	1.113E+00	3.30E-01	G
		463.51	1.995E+00	(	1.074E+00	3.67E-01	G
		176.29	-1.852E-01	%	1.671E+00	4.99E-01	G
I-131	-3.1102E-02						
		364.48	-3.110E-02	&(	2.223E-01	6.55E-02	G K
		636.97	-1.026E+00	%	3.157E+00	9.40E-01	G
		284.29	2.945E-01	%	2.741E+00	8.08E-01	G
CS-134	-8.5226E-02						
		604.66	-8.523E-02	&(	1.722E-01	5.23E-02	G K
		795.76	2.096E-01	+	1.261E-01	4.51E-02	G
		569.29	2.463E-01	&	7.095E-01	2.12E-01	G
		801.84	-1.542E-02	%	1.299E+00	3.64E-01	G
CS-137	7.9762E-01						
		661.62	7.976E-01	(	1.810E-01	8.65E-02	G
CE-139	2.7267E-02						
		165.85	2.727E-02	&(P	1.271E-01	3.81E-02	G
EU-152	-2.6138E-03						
		121.78	-2.614E-03	%(	3.434E-01	1.02E-01	G K
		344.30	-2.869E-02	&	4.362E-01	1.29E-01	G
		1408.08	0.000E+00	%	5.234E-01	1.38E-01	G
		964.00	5.213E-02	%	1.709E+00	4.99E-01	G
		1112.07	-6.406E-03	%	1.095E+00	3.06E-01	G
		778.90	1.541E-01	%	8.805E-01	2.55E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
EU-154	6.0588E-02						
		123.10	6.059E-02	%(	2.586E-01	7.77E-02	G K
		1274.80	5.413E-02	%	4.135E-01	1.17E-01	G
		723.30	-4.197E-01	%	9.185E-01	2.78E-01	G
		1004.80	7.170E-02	&	5.553E-01	1.55E-01	G
EU-155	3.0284E-02						
		86.45	3.028E-02	%(	5.141E-01	1.54E-01	G K
		105.31	2.432E-01	%	5.205E-01	1.58E-01	G
HG-203	1.8216E-01						
		279.17	2.080E-03	&(P	1.420E-01	4.16E-02	G K
		72.87	-2.890E+00	+	3.872E+00	1.18E+00	G
		70.83	4.352E+00	(	4.084E+00	1.27E+00	G
		82.50	-2.950E+00	&	7.806E+00	2.36E+00	G
TL-208	1.6020E+00						
		583.14	1.602E+00	(	1.363E-01	8.19E-02	G
		510.72	2.421E+00	+	5.565E-01	2.64E-01	G
PB-212	5.0281E+00						
		238.63	4.852E+00	(	1.742E-01	1.19E-01	G K
							Energy duplication
		77.11	4.457E+00	}	6.431E-01	2.40E-01	G
		74.81	5.832E+00	+	1.162E+00	4.22E-01	G
PB-214	2.0228E+00						
		351.99	2.023E+00	(	3.066E-01	1.40E-01	G K
		295.22	1.533E+00	-	4.080E-01	1.57E-01	G
							Energy duplication
		77.11	2.023E+00	}	1.546E+00	3.82E-02	G
		241.92	2.023E+00	}	1.202E+00	2.70E-01	G
BI-212	3.1693E+00						
		727.17	2.970E+00	(	9.011E-01	3.85E-01	G K
		1620.56	4.023E+00	(	3.750E+00	1.56E+00	G
		785.42	2.398E+00	%	6.224E+00	1.86E+00	G
BI-214	1.8441E+00						
		609.32	1.844E+00	(	2.753E-01	1.41E-01	G K
		1764.51	3.070E+00	+	4.815E-01	3.95E-01	G
		1120.28	2.372E+00	+	1.058E+00	4.63E-01	G
RA-224	3.4550E+00						
							Derived Ave Activity
		241.00	3.455E+00	}(	3.931E+00	1.25E+00	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
RA-226	4.3760E+00						
		185.99	4.376E+00	(	2.698E+00	9.02E-01	G
AC-228	3.8222E+00						
		911.07	3.827E+00	(	3.009E-01	2.36E-01	G K
		968.90	3.580E+00	(	4.721E-01	3.07E-01	G
		338.40	4.163E+00	(	9.596E-01	4.05E-01	G
TH-227	-2.6083E-01						
		236.00	-2.608E-01	%(	1.143E+00	3.43E-01	G K
		256.25	1.369E-01	&	1.493E+00	4.42E-01	G
PA-234	-1.0625E-01						
		98.44	-1.062E-01	&(	4.649E-01	1.40E-01	G K
		946.00	-5.723E-02	%	5.660E-01	1.60E-01	G
		131.28	1.630E-02	&	5.638E-01	1.68E-01	G
		94.67	-3.052E-01	%	8.793E-01	2.66E-01	G
		883.24	-1.139E-01	&	8.153E-01	2.31E-01	G
		926.70	-8.880E-02	%	9.394E-01	2.63E-01	G
		569.26	3.626E-01	&	1.046E+00	3.12E-01	G
TH-234	3.5331E+00						
		63.29	1.680E+00	&(	5.877E+00	1.77E+00	G K
		92.80	5.942E+00	(	4.425E+00	1.38E+00	G
		92.38	2.073E+00	%	4.961E+00	1.50E+00	G
AM-241	1.8270E-01						
		59.54	1.827E-01	%(P	8.068E-01	2.43E-01	G

(- This peak used in the nuclide activity average.

* - Peak is too wide, but only one peak in library.
! - Peak is part of a multiplet and this area went negative during deconvolution.
? - Peak is too narrow.
@ - Peak is too wide at FW25M, but ok at FWHM.
% - Peak fails sensitivity test.
$ - Peak identified, but first peak of this nuclide failed one or more qualification tests.
\+ - Peak activity higher than counting uncertainty range.
\- - Peak activity lower than counting uncertainty range.
= - Peak outside analysis energy range.
& - Calculated peak centroid is not close enough to the library energy centroid for positive identification.
P - Peakbackground subtraction
} - Peak is too close to another for the activity

to be found directly.

Nuclide Codes:	Peak Codes:
T - Thermal Neutron Activation	G - Gamma Ray
F - Fast Neutron Activation	X - X-Ray
I - Fission Product	P - Positron Decay
N - Naturally Occurring Isotope	S - Single-Escape
P - Photon Reaction	D - Double-Escape
C - Charged Particle Reaction	K - Key Line
M - No MDA Calculation	A - Not in Average
R - Coincidence Corrected	C - Coincidence Peak
H - Halflife limit exceeded	

- -

***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	2.4441E-01	2.6790E-01	9.0237E-01	9.0249E-01	9.278E-01
K-40		2.0406E+01	2.0406E+01	3.3483E+00	3.5413E+00	
MN-54	#A	-1.7758E-02	-1.8039E-02	1.2170E-01	1.2171E-01	1.382E-01
CO-57	#B	2.2131E-02	2.2536E-02	1.1527E-01	1.1528E-01	1.259E-01
CO-60	#B	1.9115E-02	1.9164E-02	1.0081E-01	1.0082E-01	1.275E-01
Sr-85	#A	-7.8814E-02	-8.5002E-02	1.5868E-01	1.5875E-01	1.616E-01
Kr-85	#A	-1.8210E+03	-1.8211E+03	3.3970E+03	3.3985E+03	3.732E+03
Y-88	#B	-1.6740E-03	-1.7528E-03	6.2584E-02	6.2584E-02	1.524E-01
NB-94	#B	3.8407E-03	3.8407E-03	1.0164E-01	1.0164E-01	1.204E-01
Ag-108M	#B	-7.0410E-02	-7.0417E-02	1.6186E-01	1.6191E-01	1.794E-01
CD-109		4.3691E+00	4.4166E+00	2.5423E+00	2.5541E+00	
SN-113	#B	-3.7796E-03	-3.9440E-03	1.6303E+00	1.6303E+00	1.866E-01
SB-125	#F	5.3714E-01	5.3975E-01	2.9804E-01	2.9960E-01	3.832E-01
I-131	#B	-1.6907E-02	-3.1102E-02	1.9636E-01	1.9637E-01	1.208E-01
CS-134	#B	-8.4674E-02	-8.5226E-02	1.5681E-01	1.5689E-01	1.710E-01
CS-137		7.9726E-01	7.9762E-01	2.5951E-01	2.6340E-01	
CE-139	#A	2.6312E-02	2.7267E-02	1.1424E-01	1.1425E-01	1.226E-01
EU-152	#B	-2.6110E-03	-2.6138E-03	3.0635E-01	3.0635E-01	3.431E-01
EU-154	#B	6.0493E-02	6.0588E-02	2.3299E-01	2.3301E-01	2.582E-01
EU-155	#B	3.0203E-02	3.0284E-02	4.6243E-01	4.6244E-01	5.127E-01
HG-203	#F	1.6397E-01	1.8216E-01	1.5957E-01	1.5990E-01	1.278E-01
TL-208		1.6020E+00	1.6020E+00	2.4566E-01	2.6180E-01	
PB-212		5.0281E+00	5.0281E+00	3.7107E-01	4.6734E-01	
PB-214		2.0228E+00	2.0228E+00	4.2146E-01	4.3668E-01	
BI-212		3.1693E+00	3.1693E+00	1.2318E+00	1.2448E+00	
BI-214		1.8441E+00	1.8441E+00	4.2162E-01	4.3430E-01	
RA-224	A	3.4550E+00	3.4550E+00	3.7032E+00	3.7084E+00	
RA-226		4.3760E+00	4.3760E+00	2.7072E+00	2.7184E+00	
AC-228		3.8222E+00	3.8222E+00	5.4893E-01	5.8989E-01	
TH-227	#B	-2.6083E-01	-2.6083E-01	1.0282E+00	1.0283E+00	1.143E+00
PA-234	#B	-1.0625E-01	-1.0625E-01	4.1906E-01	4.1910E-01	4.649E-01
TH-234	#B	3.5331E+00	3.5331E+00	2.4621E+00	2.4699E+00	5.877E+00

AM-241 #A	1.8270E-01	1.8270E-01	7.2754E-01	7.2761E-01	8.067E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (1120.2 to 1999.1 keV) 5.0891556E+01 pCi/gm
Total Decayed Activity (1120.2 to 1999.1 keV) 5.0939453E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
VSB

Reviewed by: _____
Supervisor

Laboratory: Yankee Chemistry

Yankee Chemistry Spectrum name: 101F_17NOV2004_1635.An1

Sample description
FSS-OOL-05-01-009-F SOIL

Spectrum Filename: C:\My Documents\FSS_ReanalysisArea\101F_17NOV2004_1635.An1

Acquisition information

Start time:	17-Nov-2004 16:27:54
Live time:	2000
Real time:	2002
Dead time:	0.12 %
Detector ID:	1

Detector system
Det 101- DSPE-633

Calibration
Filename: D1_1LSa.Clb
Detector 101 1.0 Liter Marinelli Sand

Energy Calibration

Created:	03-Sep-2004 08:50:48
Zero offset:	0.244 keV
Gain:	0.500 keV/channel
Quadratic:	-2.493E-08 keV/channel^2

Efficiency Calibration

Created:	03-Sep-2004 08:52:26
Type:	Polynomial
Uncertainty:	0.626 %
Coefficients:	-0.321775 -5.816463 0.734234
	-0.099357 0.006049 -0.000149

Library Files

Main analysis library:	FSS_Rev_1.Lib
Library Match Width:	1.000
Peak stripping:	Library based

Analysis parameters

Analysis engine:	Env32 G53W4.20
Start channel:	100 (50.23keV)
Stop channel:	4000 (1999.11keV)
Peak rejection level:	41.667%
Peak search sensitivity:	3
Sample Size:	2.0860E+03
Activity scaling factor:	1.0000E+06/(1.0000E+00* 2.0860E+03) = 4.7939E+02
Detection limit method:	Nureg 4.16
Random error:	1.0000000E+00

```
Systematic error:           1.0000000E+00
Fraction Limit:             0.000%
```

Yankee Chemistry Spectrum name: 101F_17NOV2004_1635.An1

Background width: average of five points.
Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	10-Nov-2004 10:01:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	1010K_Background_Det101.Pbc 17-May-2004 16:32:19
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 12 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.0507

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
74.31	163.	20.66	1.00	1.651E-02				
74.31	163.	20.66	1.00	1.651E-02	74.81	9.600	6.641E-01	PB212
77.38	360.	8.95	1.01	1.738E-02	77.11	10.700	1.267E+00	PB214
					77.11	17.500	7.749E-01	PB212
86.95	142.	20.63	1.01	1.917E-02	86.45	32.740	1.475E-01	EU155
89.95	120.	23.52	1.02	1.957E-02				
93.58	110.	26.59	1.02	1.997E-02	92.38	2.570	1.396E+00	TH234
					92.80	3.000	1.193E+00	TH234
185.71	88.	38.74	1.32	1.860E-02				
185.71	88.	38.74	1.32	1.860E-02	185.99	3.280	9.300E-01	RA226
209.88	100.	34.17	1.03	1.718E-02				
238.72	772.	4.32	1.12	1.558E-02				
238.72	772.	4.32	1.12	1.558E-02	238.63	43.100	7.450E-01	PB212
241.99	94.	21.71	1.12	1.540E-02	241.00	3.900	1.013E+00	RA224
270.25	64.	29.69	1.62	1.400E-02				
295.39	164.	11.35	1.16	1.292E-02	295.22	19.200	4.274E-01	PB214
300.22	49.	31.44	1.16	1.272E-02				
328.55	66.	32.45	1.07	1.168E-02				
338.34	150.	18.02	1.02	1.135E-02	338.40	12.010	7.148E-01	AC228
351.91	284.	8.28	1.02	1.093E-02				
351.91	284.	8.28	1.02	1.093E-02	351.99	37.100	4.539E-01	PB214
463.21	44.	35.05	1.09	8.347E-03				
463.21	44.	35.05	1.09	8.347E-03	463.51	10.000	3.473E-01	SB125
510.75	102.	17.88	1.33	7.590E-03	510.72	22.500	3.877E-01	TL208
583.14	235.	8.68	1.40	6.685E-03	583.14	86.000	2.652E-01	TL208
609.27	212.	11.29	1.25	6.413E-03	609.32	46.090	4.642E-01	BI214

727.00	63.	27.06	1.56	5.444E-03				
727.00	63.	27.06	1.56	5.444E-03	727.17	11.800	6.354E-01	BI212
794.35	32.	36.49	0.93	5.024E-03				
794.35	32.	36.49	0.93	5.024E-03	795.76	85.400	4.902E-02	CS134
830.89	26.	41.11	1.31	4.826E-03				
911.35	136.	12.52	1.58	4.445E-03	911.07	29.000	6.853E-01	AC228
968.98	107.	16.46	1.80	4.212E-03	968.90	17.460	9.408E-01	AC228
1120.60	66.	23.68	1.87	3.711E-03	1120.28	15.040	7.707E-01	BI214
1460.73	579.	4.21	1.71	2.943E-03	1460.75	10.700	1.192E+01	K40
1764.20	35.	16.90	0.73	2.481E-03	1764.51	15.920	5.740E-01	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide
173.47	86.95	358.	142.	0.071	61.90	1.014	TB-160 lD
179.47	89.95	341.	120.	0.060	70.57	1.016	PB-214 lD
419.44	209.88	400.	100.	0.050	102.50	1.027	NP-239 s
477.14	238.58	171.	772.	0.386	12.97	1.122	PB-212 D
483.68	241.85	162.	94.	0.047	65.12	1.124	PB-214 D
540.23	270.25	142.	64.	0.032	89.06	1.623	AC-228 s
599.96	300.10	186.	58.	0.029	118.29	1.011	PB-212
656.87	328.55	154.	66.	0.033	97.35	1.071	RH-106M
1588.93	794.35	38.	32.	0.016	109.46	0.932	AC-228 l

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-212	149.22	74.83	1064.	186.	0.093	77.65	1.499
PB-214	153.79	77.11	905.	302.	0.151	45.63	1.499D
PB-212	153.79	77.11	905.	302.	0.151	45.63	1.499D
TH-234	186.00	93.21	987.	113.	0.056	121.59	1.499
TH-234	185.96	93.19	962.	113.	0.056	120.10	1.499s
RA-226	371.86	186.10	483.	89.	0.044	109.74	1.499s
PB-212	477.11	238.71	371.	634.	0.317	17.55	1.499
RA-224	483.01	241.65	465.	91.	0.045	105.67	1.499s
PB-214	480.45	240.38	652.	-91.	-0.045	123.67	1.499
PB-214	590.31	295.28	222.	131.	0.065	55.02	1.499
AC-228	676.46	338.34	183.	150.	0.075	54.07	1.018s
PB-214	703.69	351.95	122.	270.	0.135	25.14	1.499
SB-125	926.11	463.11	90.	38.	0.019	117.40	1.499
TL-208	1021.45	510.75	83.	102.	0.051	53.65	1.335s
TL-208	1166.28	583.14	63.	235.	0.118	26.04	1.397
BI-214	1218.57	609.27	97.	212.	0.106	33.86	1.252
BI-212	1454.90	727.37	36.	49.	0.024	67.39	1.499
AC-228	1823.04	911.35	46.	136.	0.068	37.55	1.584s
AC-228	1938.38	968.98	53.	107.	0.053	49.37	1.804
BI-214	2241.78	1120.60	48.	66.	0.033	71.05	1.865s
K-40	2922.47	1460.73	4.	579.	0.290	12.64	1.705

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
BI-214	3529.83	1764.20	0.	35.	0.018	50.71	0.729s

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	Peak MDA Value pCi/gm	COMMENTS
BE-7		-3.9101E-02					
			477.56	-3.910E-02	%(	3.785E-01 1.09E-01	G
K-40		1.1922E+01					
			1460.75	1.192E+01	(	2.377E-01 5.02E-01	G
MN-54		6.4028E-03					
			834.81	6.403E-03	%(	4.905E-02 1.41E-02	G
CO-57		1.2316E-02					
			122.07	1.232E-02	%(P	4.764E-02 1.43E-02	G K
			136.43	-9.493E-03	%	3.886E-01 1.16E-01	G
CO-60		-4.7955E-03					
			1332.51	-4.796E-03	%(P	5.806E-02 1.48E-02	G K
			1173.23	-1.033E-02	% P	8.521E-02 2.35E-02	G K
Sr-85		-2.1880E-02					
			514.00	-2.188E-02	%(	5.419E-02 1.63E-02	G
Kr-85		-4.6736E+02					
			513.99	-4.674E+02	%(	1.157E+03 3.48E+02	G
Y-88		3.0776E-03					
			1836.01	3.078E-03	%(P	3.860E-02 9.72E-03	G K
			898.02	5.017E-03	& P	4.709E-02 1.32E-02	G
NB-94		3.2541E-03					
			871.10	3.254E-03	%(	4.113E-02 1.15E-02	G K
			702.50	1.031E-02	%	3.153E-02 9.28E-03	G K
Ag-108M		2.6614E-03					
			722.95	2.661E-03	%(	4.475E-02 1.26E-02	G K
			614.37	-2.743E-04	%	4.518E-02 1.28E-02	G
			433.93	-7.488E-03	%	4.108E-02 1.21E-02	G

Yankee Chemistry Spectrum name: 101F_17NOV2004_1635.An1

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CD-109	3.2985E-01						
		88.04	3.298E-01	%(	1.132E+00	3.40E-01	G
SN-113	-2.6433E-03						
		391.71	-2.643E-03	%(P	6.107E-02	1.76E-02	G K
		255.04	2.990E-03	%	1.769E+00	5.19E-01	G
SB-125	7.0498E-02						
		427.95	-5.113E-03	&(	1.170E-01	3.37E-02	G K
		600.77	-1.369E-02	%	1.468E-01	4.10E-02	G
		636.15	-3.263E-02	%	3.406E-01	9.72E-02	G
		463.51	2.943E-01	(	3.662E-01	1.15E-01	G
		176.29	-2.104E-02	&	5.898E-01	1.75E-01	G
I-131	1.8441E-03						
		364.48	1.844E-03	%(	7.752E-02	2.24E-02	G K
		636.97	-1.463E-01	%	1.019E+00	2.94E-01	G
		284.29	1.249E-01	%	9.045E-01	2.66E-01	G
CS-134	-1.1911E-03						
		604.66	-1.191E-03	%(	4.242E-02	1.21E-02	G K
		795.76	2.674E-02	%	4.307E-02	1.34E-02	G
		569.29	0.000E+00	&	3.061E-01	8.78E-02	G
		801.84	1.110E-01	&	5.196E-01	1.51E-01	G
CS-137	-4.0614E-03						
		661.62	-4.061E-03	%(	4.048E-02	1.15E-02	G
CE-139	-1.5035E-02						
		165.85	-1.503E-02	%(P	4.834E-02	1.45E-02	G
EU-152	3.6204E-02						
		121.78	3.620E-02	%(	1.368E-01	4.11E-02	G K
		344.30	-3.052E-02	%	1.227E-01	3.64E-02	G
		1408.08	3.549E-02	%	2.112E-01	5.89E-02	G
		964.00	1.108E-01	%	4.101E-01	1.21E-01	G
		1112.07	9.179E-02	&	3.712E-01	1.08E-01	G
		778.90	-1.791E-02	&	3.561E-01	1.01E-01	G
EU-154	2.5149E-02						
		123.10	2.515E-02	&(	9.394E-02	2.82E-02	G K
		1274.80	-2.777E-02	%	1.638E-01	4.68E-02	G
		723.30	2.656E-03	%	2.210E-01	6.22E-02	G
		1004.80	-4.855E-04	&	3.023E-01	8.43E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
EU-155	3.3183E-03						
		86.45	3.318E-03	&(	1.668E-01	4.98E-02	G K
		105.31	4.703E-02	&	1.783E-01	5.36E-02	G
HG-203	-3.1441E-03						
		279.17	-3.144E-03	%(P	4.637E-02	1.34E-02	G K
		72.87	-1.302E-01	%	1.036E+00	3.10E-01	G
		70.83	-3.595E-01	%	2.097E+00	6.29E-01	G
		82.50	4.211E-02	%	2.568E+00	7.65E-01	G
TL-208	2.6516E-01						
		583.14	2.652E-01	(	4.464E-02	2.30E-02	G
		510.72	3.877E-01	+	1.711E-01	6.93E-02	G
PB-212	6.2298E-01						
		238.63	6.120E-01	(	8.928E-02	3.58E-02	G K
							Energy duplication
		77.11	6.500E-01	(	3.074E-01	9.89E-02	G
		74.81	7.582E-01	&	6.312E-01	1.96E-01	G
PB-214	4.3228E-01						
		351.99	4.323E-01	(	8.649E-02	3.62E-02	G K
		295.22	3.416E-01	-	1.885E-01	6.26E-02	G
							Energy duplication
		77.11	1.063E+00	+	5.028E-01	1.62E-01	G
		241.92	-5.103E-01	-	6.855E-01	2.10E-01	G
BI-212	4.9290E-01						
		727.17	4.929E-01	(	3.087E-01	1.11E-01	G K
		1620.56	7.211E-01	%	1.211E+00	3.88E-01	G
		785.42	4.420E-01	%	1.884E+00	5.46E-01	G
BI-214	4.9241E-01						
		609.32	4.642E-01	(	1.066E-01	5.24E-02	G K
		1764.51	5.740E-01	(	1.209E-01	9.70E-02	G
		1120.28	7.707E-01	+	4.046E-01	1.83E-01	G
RA-224	9.7554E-01						
		241.00	9.755E-01	(	1.110E+00	3.44E-01	G
RA-226	9.4345E-01						
		185.99	9.435E-01	(	1.117E+00	3.45E-01	G
AC-228	6.9390E-01						
		911.07	6.853E-01	@(	1.717E-01	8.58E-02	G K
		968.90	9.408E-01	+	3.233E-01	1.55E-01	G
		338.40	7.148E-01	@(	3.121E-01	1.29E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TH-227	-3.9179E-03						
		236.00	-3.918E-03	%(	4.014E-01	1.19E-01	G K
		256.25	1.616E-01	%	5.060E-01	1.52E-01	G
PA-234	-6.0089E-02						
		98.44	-6.009E-02	%(	1.724E-01	5.20E-02	G K
		946.00	0.000E+00	%	2.908E-01	8.21E-02	G
		131.28	-3.334E-02	%	2.103E-01	6.30E-02	G
		94.67	-6.495E-02	%	2.662E-01	7.99E-02	G
		883.24	1.227E-01	&	3.474E-01	1.03E-01	G
		926.70	-5.459E-02	&	3.637E-01	1.03E-01	G
		569.26	0.000E+00	&	4.511E-01	1.29E-01	G
TH-234	1.0878E+00						
		63.29	7.573E-01	%(	1.995E+00	6.03E-01	G K
		92.80	1.224E+00	@(	1.598E+00	4.90E-01	G
		92.38	1.431E+00	&(	1.893E+00	5.80E-01	G
AM-241	2.0819E-02						
		59.54	2.082E-02	%(P	2.789E-01	8.32E-02	G

(- This peak used in the nuclide activity average.

* - Peak is too wide, but only one peak in library.
! - Peak is part of a multiplet and this area went negative during deconvolution.
? - Peak is too narrow.
@ - Peak is too wide at FW25M, but ok at FWHM.
% - Peak fails sensitivity test.
$ - Peak identified, but first peak of this nuclide failed one or more qualification tests.
\+ - Peak activity higher than counting uncertainty range.
\- - Peak activity lower than counting uncertainty range.
= - Peak outside analysis energy range.
& - Calculated peak centroid is not close enough to the library energy centroid for positive identification.
P - Peakbackground subtraction
} - Peak is too close to another for the activity to be found directly.

Nuclide Codes:	Peak Codes:
T - Thermal Neutron Activation	G - Gamma Ray
F - Fast Neutron Activation	X - X-Ray
I - Fission Product	P - Positron Decay
N - Naturally Occurring Isotope	S - Single-Escape
P - Photon Reaction	D - Double-Escape
C - Charged Particle Reaction	K - Key Line
M - No MDA Calculation	A - Not in Average

R - Coincidence Corrected C - Coincidence Peak
H - Halflife limit exceeded

- -

***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	-3.5580E-02	-3.9101E-02	3.2818E-01	3.2818E-01	3.444E-01
K-40		1.1922E+01	1.1922E+01	1.5069E+00	1.6506E+00	
MN-54	#A	6.3003E-03	6.4028E-03	4.2225E-02	4.2227E-02	4.827E-02
CO-57	#B	1.2089E-02	1.2316E-02	4.2925E-02	4.2931E-02	4.676E-02
CO-60	#B	-4.7830E-03	-4.7955E-03	9.4870E-02	9.4870E-02	5.791E-02
Sr-85	#A	-2.0244E-02	-2.1880E-02	4.8944E-02	4.8960E-02	5.013E-02
Kr-85	#A	-4.6734E+02	-4.6736E+02	1.0455E+03	1.0458E+03	1.157E+03
Y-88	#B	2.9356E-03	3.0776E-03	2.9160E-02	2.9160E-02	3.682E-02
NB-94	#B	3.2541E-03	3.2541E-03	3.4591E-02	3.4591E-02	4.113E-02
Ag-108M	#B	2.6611E-03	2.6614E-03	3.7925E-02	3.7926E-02	4.474E-02
CD-109	#A	3.2620E-01	3.2985E-01	1.0212E+00	1.0214E+00	1.119E+00
SN-113	#B	-2.5301E-03	-2.6433E-03	1.5302E-01	1.5302E-01	5.845E-02
SB-125	#B	7.0148E-02	7.0498E-02	8.2767E-02	8.2863E-02	1.164E-01
I-131	#B	9.8547E-04	1.8441E-03	6.7269E-02	6.7269E-02	4.143E-02
CS-134	#B	-1.1832E-03	-1.1911E-03	3.6222E-02	3.6222E-02	4.214E-02
CS-137	#A	-4.0596E-03	-4.0614E-03	3.4364E-02	3.4365E-02	4.046E-02
CE-139	#A	-1.4494E-02	-1.5035E-02	4.3961E-02	4.3969E-02	4.660E-02
EU-152	#B	3.6165E-02	3.6204E-02	1.2332E-01	1.2334E-01	1.366E-01
EU-154	#B	2.5108E-02	2.5149E-02	8.4677E-02	8.4689E-02	9.379E-02
EU-155	#B	3.3090E-03	3.3183E-03	1.4941E-01	1.4941E-01	1.663E-01
HG-203	#B	-2.8218E-03	-3.1441E-03	1.4656E+00	1.4656E+00	4.162E-02
TL-208		2.6516E-01	2.6516E-01	6.9047E-02	7.0654E-02	
PB-212	#	6.2298E-01	6.2298E-01	1.0936E-01	1.1488E-01	8.928E-02
PB-214	#	4.3228E-01	4.3228E-01	1.0869E-01	1.1140E-01	8.649E-02
BI-212	#	4.9290E-01	4.9290E-01	3.3218E-01	3.3334E-01	3.087E-01
BI-214		4.9241E-01	4.9241E-01	1.5012E-01	1.5268E-01	
RA-224	#A	9.7554E-01	9.7554E-01	1.0309E+00	1.0323E+00	1.110E+00
RA-226	#A	9.4345E-01	9.4345E-01	1.0353E+00	1.0367E+00	1.117E+00
AC-228		6.9390E-01	6.9390E-01	2.2838E-01	2.3173E-01	
TH-227	#B	-3.9179E-03	-3.9179E-03	3.5659E-01	3.5659E-01	4.014E-01
PA-234	#B	-6.0089E-02	-6.0089E-02	1.5605E-01	1.5608E-01	1.724E-01
TH-234	#B	1.0878E+00	1.0878E+00	1.0648E+00	1.0665E+00	1.995E+00
AM-241	#A	2.0819E-02	2.0819E-02	2.4951E-01	2.4952E-01	2.789E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.

H - Halflife limit exceeded

Yankee Chemistry Spectrum name: 101F_17NOV2004_1635.An1

---------- S U M M A R Y ----------

Total Activity (264.6 to 1999.1 keV) 1.3373161E+01 pCi/gm
Total Decayed Activity (264.6 to 1999.1 keV) 1.3373161E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
VSB

Reviewed by: _____
Supervisor

Laboratory: Yankee Chemistry

Yankee Chemistry Spectrum name: 101F_17NOV2004_1710.An1

Sample description
FSS-OOL-05-01-017-F SOIL

Spectrum Filename: C:\My Documents\FSS_ReanalysisArea\101F_17NOV2004_1710.An1

Acquisition information
Start time: 17-Nov-2004 17:03:48
Live time: 2000
Real time: 2002
Dead time: 0.10 %
Detector ID: 1

Detector system
Det 101- DSPE-633

Calibration
Filename: D1_1LSa.Clb
Detector 101 1.0 Liter Marinelli Sand

Energy Calibration
Created: 03-Sep-2004 08:50:48
Zero offset: 0.244 keV
Gain: 0.500 keV/channel
Quadratic: -2.493E-08 keV/channel^2

Efficiency Calibration
Created: 03-Sep-2004 08:52:26
Type: Polynomial
Uncertainty: 0.626 %
Coefficients: -0.321775 -5.816463 0.734234
-0.099357 0.006049 -0.000149

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.23keV)
Stop channel: 4000 (1999.11keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 8.9700E+02
Activity scaling factor: 1.0000E+06/(1.0000E+00* 8.9700E+02) =
1.1148E+03
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00

```
Systematic error:           1.0000000E+00
Fraction Limit:             0.000%
```

Yankee Chemistry Spectrum name: 101F_17NOV2004_1710.An1

Background width: average of five points.
Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	10-Nov-2004 10:14:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	1010K_Background_Det101.Pbc 17-May-2004 16:32:19
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 13 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.1172

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
74.86	171.	21.44	1.50	1.654E-02	70.83	3.520	5.397E+00	HG203
					74.81	9.600	1.623E+00	PB212
76.99	218.	16.67	1.50	1.720E-02	77.11	10.700	1.783E+00	PB214
					77.11	17.500	1.090E+00	PB212
76.99	218.	16.67	1.50	1.720E-02	77.11	10.700	1.783E+00	PB214
					77.11	17.500	1.090E+00	PB212
84.41	50.	41.27	0.85	1.877E-02				
87.19	97.	21.23	1.01	1.922E-02	86.45	32.740	2.336E-01	EU155
					88.04	3.790	2.011E+00	CD109
89.86	92.	21.75	1.02	1.957E-02				
92.97	99.	21.90	1.02	1.992E-02	92.38	2.570	2.909E+00	TH234
					92.80	3.000	2.487E+00	TH234
186.17	97.	23.59	1.20	1.857E-02	185.99	3.280	2.407E+00	RA226
209.49	90.	24.91	1.12	1.720E-02				
238.72	629.	4.52	1.12	1.557E-02	238.63	43.100	1.413E+00	PB212
241.59	70.	26.00	1.12	1.542E-02	241.00	3.900	1.742E+00	RA224
					241.92	7.470	9.126E-01	PB214
270.70	69.	25.97	1.48	1.398E-02				
295.29	132.	15.20	1.13	1.292E-02	295.22	19.200	8.016E-01	PB214
327.75	54.	30.17	1.11	1.170E-02				
338.42	116.	16.74	0.96	1.135E-02	338.40	12.010	1.283E+00	AC228
351.76	255.	9.46	1.30	1.093E-02				
351.76	255.	9.46	1.30	1.093E-02	351.99	37.100	9.478E-01	PB214
510.68	97.	17.66	2.28	7.590E-03	510.72	22.500	8.574E-01	TL208
583.29	162.	12.66	1.24	6.683E-03	583.14	86.000	4.253E-01	TL208
609.39	157.	12.11	1.40	6.412E-03	609.32	46.090	7.992E-01	BI214

					614.37	90.393	4.107E-01	Ag108M
661.57	223.	7.58	1.54	5.938E-03	661.62	84.620	6.690E-01	CS137
726.45	65.	24.78	1.20	5.443E-03	727.17	11.800	1.518E+00	BI212
911.12	90.	14.40	1.63	4.446E-03	911.07	29.000	1.049E+00	AC228
968.23	62.	17.76	2.29	4.215E-03	968.90	17.460	1.278E+00	AC228

Yankee Chemistry Spectrum name: 101F_17NOV2004_1710.An1

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
1119.27	50.	26.53	1.62	3.711E-03	1120.28	15.040	1.350E+00	BI214
1460.76	344.	5.39	1.80	2.942E-03	1460.75	10.700	1.646E+01	K40
1764.72	26.	19.61	1.06	2.481E-03	1764.51	15.920	9.916E-01	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
173.95	87.28	162.	97.	0.048	63.70	1.014	PB-214	lD
179.30	89.96	154.	92.	0.046	65.25	1.016	PB-214	lD
418.65	209.49	174.	90.	0.045	74.73	1.124	AC-228	
477.14	238.70	91.	629.	0.315	13.57	1.122	PB-212	D
482.89	241.58	129.	70.	0.035	78.00	1.124	PB-214	D
541.14	270.70	105.	69.	0.034	77.90	1.483	AC-228	s
655.27	327.75	90.	54.	0.027	90.52	1.110	AC-228	

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-212	149.29	74.86	587.	171.	0.086	64.32	1.499s
PB-214	153.79	77.11	551.	218.	0.109	50.02	1.499D
PB-212	153.79	77.11	551.	218.	0.109	50.02	1.499D
TH-234	185.70	93.06	467.	106.	0.053	91.60	1.499s
TH-234	185.68	93.05	436.	110.	0.055	85.57	1.499s
RA-226	372.06	186.20	287.	91.	0.045	85.42	1.499s
PB-212	477.09	238.69	235.	484.	0.242	19.13	1.499
PB-214	590.32	295.28	109.	122.	0.061	45.26	1.499s
AC-228	676.63	338.42	97.	116.	0.058	50.22	0.957
PB-214	703.73	351.97	91.	207.	0.103	28.63	1.499
TL-208	1021.31	510.68	60.	97.	0.049	52.97	2.281s
TL-208	1166.59	583.29	67.	162.	0.081	37.99	1.239
BI-214	1218.82	609.39	52.	157.	0.078	36.32	1.403
CS-137	1323.23	661.57	24.	223.	0.112	22.73	1.540s
BI-212	1453.05	726.45	49.	65.	0.032	74.33	1.202s
AC-228	1822.59	911.12	24.	90.	0.045	43.20	1.625s
AC-228	1936.87	968.23	22.	62.	0.031	53.29	2.285s
BI-214	2239.13	1119.27	28.	50.	0.025	79.60	1.617s
K-40	2922.54	1460.76	0.	344.	0.172	16.17	1.796

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
BI-214	3530.88	1764.72	0.	26.	0.013	58.83	1.062s

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	Peak MDA Value pCi/gm	COMMENTS
BE-7		1.3169E-01					
			477.56	1.317E-01	%(	7.467E-01 2.16E-01	G
K-40		1.6460E+01					
			1460.75	1.646E+01	(	3.527E-01 8.87E-01	G
MN-54		2.2091E-02					
			834.81	2.209E-02	&(	8.751E-02 2.54E-02	G
CO-57		8.8388E-03					
			122.07	8.839E-03	%(P	7.230E-02 2.14E-02	G K
			136.43	-6.334E-02	%	6.406E-01 1.90E-01	G
CO-60		-3.2323E-02					
			1332.51	-3.232E-02	%(P	1.149E-01 2.60E-02	G K
			1173.23	1.246E-02	% P	1.077E-01 2.79E-02	G K
Sr-85		-2.9152E-02					
			514.00	-2.915E-02	%(	1.091E-01 3.23E-02	G
Kr-85		-6.2259E+02					
			513.99	-6.226E+02	%(	2.329E+03 6.90E+02	G
Y-88		-4.3473E-03					
			1836.01	-4.347E-03	&(P	1.154E-01 2.95E-02	G K
			898.02	-2.985E-03	% P	1.015E-01 2.73E-02	G
NB-94		-1.4819E-02					
			871.10	-1.482E-02	%(	9.418E-02 2.68E-02	G K
			702.50	8.596E-03	%	8.738E-02 2.48E-02	G K
Ag-108M		-1.8803E-02					
			722.95	-1.880E-02	%(	1.178E-01 3.41E-02	G K
			614.37	-4.821E-03	%	9.427E-02 2.67E-02	G
			433.93	1.657E-02	&	7.692E-02 2.25E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CD-109	-1.1809E-01						
		88.04	-1.181E-01	&(	2.424E+00	7.20E-01	G
SN-113	9.9895E-03						
		391.71	9.989E-03	%(P	1.107E-01	3.18E-02	G K
		255.04	7.414E-02	%	3.061E+00	8.89E-01	G
SB-125	2.3360E-03						
		427.95	2.336E-03	&(	1.883E-01	5.26E-02	G K
		600.77	-5.104E-02	%	3.628E-01	1.03E-01	G
		636.15	-5.187E-02	%	7.040E-01	1.98E-01	G
		463.51	3.774E-01	%	7.412E-01	2.26E-01	G
		176.29	0.000E+00	&	1.007E+00	2.95E-01	G
I-131	8.6556E-03						
		364.48	8.656E-03	&(	1.360E-01	3.89E-02	G K
		636.97	6.722E-02	&	2.064E+00	5.78E-01	G
		284.29	3.659E-02	%	1.931E+00	5.58E-01	G
CS-134	0.0000E+00						
		604.66	0.000E+00	%(	1.753E-01	5.12E-02	G K
		795.76	3.674E-02	%	8.786E-02	2.63E-02	G
		569.29	-6.005E-04	%	3.913E-01	1.07E-01	G
		801.84	1.383E-01	&	9.928E-01	2.81E-01	G
CS-137	6.6897E-01						
		661.62	6.690E-01	@(	7.661E-02	5.07E-02	G
CE-139	1.9710E-03						
		165.85	1.971E-03	&(P	8.445E-02	2.49E-02	G
EU-152	3.5282E-02						
		121.78	3.528E-02	%(	2.102E-01	6.25E-02	G K
		344.30	4.289E-02	%	2.215E-01	6.48E-02	G
		1408.08	1.721E-01	%	3.064E-01	9.73E-02	G
		964.00	-1.170E-01	%	7.956E-01	2.28E-01	G
		1112.07	0.000E+00	%	8.777E-01	2.42E-01	G
		778.90	-8.151E-02	&	5.709E-01	1.60E-01	G
EU-154	2.2784E-03						
		123.10	2.278E-03	%(	1.521E-01	4.47E-02	G K
		1274.80	2.945E-02	&	2.893E-01	7.97E-02	G
		723.30	-8.683E-02	%	5.386E-01	1.56E-01	G
		1004.80	4.061E-02	%	4.266E-01	1.16E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
EU-155	8.3614E-02						
		86.45	8.361E-02	%(	2.765E-01	8.32E-02	G K
		105.31	1.720E-01	%	3.135E-01	9.55E-02	G
HG-203	2.2190E-02						
		279.17	2.219E-02	&(P	8.289E-02	2.44E-02	G K
		72.87	-9.511E-01	%	2.286E+00	6.92E-01	G
		70.83	-1.826E+00	%	3.591E+00	1.09E+00	G
		82.50	-1.313E+00	%	4.457E+00	1.34E+00	G
TL-208	4.2533E-01						
		583.14	4.253E-01	(	1.068E-01	5.39E-02	G
		510.72	8.574E-01	+	3.418E-01	1.51E-01	G
PB-212	1.0876E+00						
		238.63	1.086E+00	(	1.663E-01	6.93E-02	G K
							Energy duplication
		77.11	1.090E+00	(	5.610E-01	1.82E-01	G
		74.81	1.623E+00	&	1.097E+00	3.48E-01	G
PB-214	7.6023E-01						
		351.99	7.690E-01	(	1.758E-01	7.34E-02	G K
		295.22	7.433E-01	*(	3.123E-01	1.12E-01	G
							Energy duplication
		77.11	1.783E+00	+	9.175E-01	2.97E-01	G
		241.92	2.779E-01	%	1.197E+00	3.58E-01	G
BI-212	1.5176E+00						
		727.17	1.518E+00	*(	8.311E-01	3.76E-01	G K
		1620.56	-3.578E-01	&	3.671E+00	9.84E-01	G
		785.42	7.722E-01	&	3.233E+00	9.23E-01	G
BI-214	8.4861E-01						
		609.32	7.992E-01	(	1.854E-01	9.68E-02	G K
		1764.51	9.916E-01	(	2.811E-01	1.94E-01	G
		1120.28	1.350E+00	+	7.388E-01	3.58E-01	G
RA-224	1.4205E+00						
		241.00	1.421E+00	%(	2.055E+00	6.32E-01	G
RA-226	2.2383E+00						
		185.99	2.238E+00	@(	2.019E+00	6.37E-01	G
AC-228	1.1656E+00						
		911.07	1.049E+00	@(	2.995E-01	1.51E-01	G K
		968.90	1.278E+00	(	4.992E-01	2.27E-01	G
		338.40	1.283E+00	(	5.369E-01	2.15E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TH-227	-7.6516E-02						
		236.00	-7.652E-02	%(	6.758E-01	2.00E-01	G K
		256.25	5.945E-02	%	8.857E-01	2.58E-01	G
PA-234	3.8632E-03						
		98.44	3.863E-03	&(	2.704E-01	7.97E-02	G K
		946.00	8.569E-02	%	4.170E-01	1.19E-01	G
		131.28	5.721E-03	&	3.407E-01	1.01E-01	G
		94.67	-1.167E-01	%	5.040E-01	1.51E-01	G
		883.24	7.311E-02	&	7.333E-01	2.05E-01	G
		926.70	3.395E-03	%	6.630E-01	1.76E-01	G
		569.26	-1.837E-03	%	5.769E-01	1.58E-01	G
TH-234	2.0975E+00						
		63.29	9.037E-01	&(	3.542E+00	1.06E+00	G K
		92.80	2.774E+00	*(	2.526E+00	7.91E-01	G
		92.38	3.119E+00	*(	3.055E+00	9.52E-01	G
AM-241	-8.3257E-02						
		59.54	-8.326E-02	%(P	4.896E-01	1.46E-01	G

(- This peak used in the nuclide activity average.

* - Peak is too wide, but only one peak in library.
! - Peak is part of a multiplet and this area went negative during deconvolution.
? - Peak is too narrow.
@ - Peak is too wide at FW25M, but ok at FWHM.
% - Peak fails sensitivity test.
$ - Peak identified, but first peak of this nuclide failed one or more qualification tests.
\+ - Peak activity higher than counting uncertainty range.
\- - Peak activity lower than counting uncertainty range.
= - Peak outside analysis energy range.
& - Calculated peak centroid is not close enough to the library energy centroid for positive identification.
P - Peakbackground subtraction
} - Peak is too close to another for the activity to be found directly.

Nuclide Codes:	Peak Codes:
T - Thermal Neutron Activation	G - Gamma Ray
F - Fast Neutron Activation	X - X-Ray
I - Fission Product	P - Positron Decay
N - Naturally Occurring Isotope	S - Single-Escape
P - Photon Reaction	D - Double-Escape
C - Charged Particle Reaction	K - Key Line
M - No MDA Calculation	A - Not in Average

R - Coincidence Corrected C - Coincidence Peak
H - Halflife limit exceeded

- -

***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	1.1981E-01	1.3169E-01	6.4919E-01	6.4924E-01	6.793E-01
K-40		1.6460E+01	1.6460E+01	2.6625E+00	2.8202E+00	
MN-54	#A	2.1737E-02	2.2091E-02	7.6093E-02	7.6103E-02	8.611E-02
CO-57	#B	8.6750E-03	8.8388E-03	6.4194E-02	6.4196E-02	7.096E-02
CO-60	#B	-3.2238E-02	-3.2323E-02	2.9487E+00	2.9487E+00	1.146E-01
Sr-85	#A	-2.6968E-02	-2.9152E-02	9.6918E-02	9.6932E-02	1.009E-01
Kr-85	#A	-6.2256E+02	-6.2259E+02	2.0699E+03	2.0702E+03	2.329E+03
Y-88	#B	-4.1462E-03	-4.3473E-03	1.9562E-01	1.9562E-01	1.101E-01
NB-94	#B	-1.4819E-02	-1.4819E-02	8.0461E-02	8.0465E-02	9.418E-02
Ag-108M	#B	-1.8801E-02	-1.8803E-02	1.0230E-01	1.0230E-01	1.178E-01
CD-109	#A	-1.1678E-01	-1.1809E-01	2.1606E+00	2.1606E+00	2.397E+00
SN-113	#B	9.5607E-03	9.9895E-03	9.5502E-02	9.5504E-02	1.060E-01
SB-125	#B	2.3243E-03	2.3360E-03	1.5779E-01	1.5779E-01	1.873E-01
I-131	#B	4.6190E-03	8.6556E-03	1.1678E-01	1.1678E-01	7.256E-02
CS-134	#B	0.0000E+00	0.0000E+00	1.5363E-01	1.5363E-01	1.741E-01
CS-137	#	6.6866E-01	6.6897E-01	1.5204E-01	1.5667E-01	
CE-139	#A	1.8999E-03	1.9710E-03	7.4552E-02	7.4552E-02	8.141E-02
EU-152	#B	3.5244E-02	3.5282E-02	1.8744E-01	1.8745E-01	2.100E-01
EU-154	#B	2.2747E-03	2.2784E-03	1.3425E-01	1.3425E-01	1.518E-01
EU-155	#B	8.3382E-02	8.3614E-02	2.4948E-01	2.4953E-01	2.758E-01
HG-203	#B	1.9911E-02	2.2190E-02	7.3087E-02	7.3098E-02	7.437E-02
TL-208		4.2533E-01	4.2533E-01	1.6159E-01	1.6337E-01	
PB-212	#	1.0876E+00	1.0876E+00	2.0808E-01	2.1697E-01	1.663E-01
PB-214	#	7.6023E-01	7.6023E-01	2.0357E-01	2.0806E-01	1.758E-01
BI-212	#	1.5176E+00	1.5176E+00	1.1280E+00	1.1313E+00	
BI-214		8.4861E-01	8.4861E-01	2.9338E-01	2.9727E-01	
RA-224	#A	1.4205E+00	1.4205E+00	1.8958E+00	1.8975E+00	2.055E+00
RA-226	#	2.2383E+00	2.2383E+00	1.9121E+00	1.9162E+00	2.019E+00
AC-228		1.1656E+00	1.1656E+00	3.3035E-01	3.3685E-01	
TH-227	#B	-7.6516E-02	-7.6516E-02	5.9908E-01	5.9910E-01	6.758E-01
PA-234	#B	3.8632E-03	3.8632E-03	2.3910E-01	2.3910E-01	2.704E-01
TH-234	#B	2.0975E+00	2.0975E+00	1.7948E+00	1.7986E+00	3.542E+00
AM-241	#A	-8.3254E-02	-8.3257E-02	4.5117E-01	4.5119E-01	4.896E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.

H - Halflife limit exceeded

Yankee Chemistry Spectrum name: 101F_17NOV2004_1710.An1

---------- S U M M A R Y ----------

Total Activity (270.6 to 1999.1 keV) 2.1086231E+01 pCi/gm
Total Decayed Activity (270.6 to 1999.1 keV) 2.1086540E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
VSB

Reviewed by: _____
Supervisor

Laboratory: Yankee Chemistry

Yankee Chemistry Spectrum name: 101F_17NOV2004_1750.An1

Sample description
FSS-OOL-05-01-016-F SOIL

Spectrum Filename: C:\My Documents\FSS_ReanalysisArea\101F_17NOV2004_1750.An1

Acquisition information
Start time: 17-Nov-2004 17:41:43
Live time: 2000
Real time: 2003
Dead time: 0.13 %
Detector ID: 1

Detector system
Det 101- DSPE-633

Calibration
Filename: D1_1LSa.Clb
Detector 101 1.0 Liter Marinelli Sand

Energy Calibration
Created: 03-Sep-2004 08:50:48
Zero offset: 0.244 keV
Gain: 0.500 keV/channel
Quadratic: -2.493E-08 keV/channel^2

Efficiency Calibration
Created: 03-Sep-2004 08:52:26
Type: Polynomial
Uncertainty: 0.626 %
Coefficients: -0.321775 -5.816463 0.734234
-0.099357 0.006049 -0.000149

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.23keV)
Stop channel: 4000 (1999.11keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 1.4530E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.4530E+03) =
6.8823E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00

```
Systematic error:           1.0000000E+00
Fraction Limit:             0.000%
```

Yankee Chemistry Spectrum name: 101F_17NOV2004_1750.An1

Background width: average of five points.
Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	10-Nov-2004 10:30:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	1010K_Background_Det101.Pbc 17-May-2004 16:32:19
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 17 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.1068

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
74.28	130.	24.94	1.00	1.651E-02				
74.28	130.	24.94	1.00	1.651E-02	74.81	9.600	7.637E-01	PB212
77.21	366.	8.51	1.01	1.734E-02	77.11	10.700	1.850E+00	PB214
					77.11	17.500	1.131E+00	PB212
87.30	111.	37.83	1.50	1.910E-02	86.45	32.740	PBC<MDA	EU155
93.43	112.	29.71	1.29	1.996E-02	92.38	2.570	2.051E+00	TH234
					92.80	3.000	1.753E+00	TH234
185.98	118.	27.30	0.99	1.858E-02				
185.98	118.	27.30	0.99	1.858E-02	185.99	3.280	1.793E+00	RA226
209.75	72.	40.18	1.30	1.719E-02				
238.73	664.	4.59	1.12	1.557E-02	238.63	43.100	9.196E-01	PB212
241.95	117.	16.85	1.12	1.540E-02	241.00	3.900	1.803E+00	RA224
					241.92	7.470	9.443E-01	PB214
277.38	75.	35.36	1.74	1.368E-02				
295.40	197.	9.59	1.16	1.292E-02	295.22	19.200	7.369E-01	PB214
300.30	47.	30.11	1.16	1.272E-02				
328.11	49.	35.57	1.18	1.169E-02				
338.44	154.	17.05	1.02	1.135E-02	338.40	12.010	1.049E+00	AC228
351.94	292.	9.38	1.31	1.093E-02				
351.94	292.	9.38	1.31	1.093E-02	351.99	37.100	6.700E-01	PB214
462.99	54.	26.48	1.78	8.351E-03				
462.99	54.	26.48	1.78	8.351E-03	463.51	10.000	6.107E-01	SB125
510.87	102.	22.40	1.12	7.588E-03	510.72	22.500	5.555E-01	TL208
583.18	237.	9.65	1.42	6.684E-03	583.14	86.000	3.841E-01	TL208
609.48	244.	8.83	1.23	6.411E-03	609.32	46.090	7.684E-01	BI214
661.82	223.	10.16	1.59	5.936E-03	661.62	84.620	4.124E-01	CS137

727.49	46.	26.55	1.40	5.441E-03	727.17	11.800	6.603E-01	BI212
794.86	52.	27.55	1.46	5.021E-03				
794.86	52.	27.55	1.46	5.021E-03	795.76	85.400	1.126E-01	CS134
911.22	167.	10.25	1.96	4.446E-03	911.07	29.000	1.204E+00	AC228
964.67	36.	24.13	1.61	4.228E-03	964.00	14.580	5.507E-01	EU152
969.02	78.	13.42	1.62	4.211E-03	968.90	17.460	9.831E-01	AC228
1119.87	76.	19.36	1.71	3.711E-03	1120.28	15.040	1.266E+00	BI214
1460.74	454.	4.78	2.22	2.942E-03	1460.75	10.700	1.342E+01	K40

Yankee Chemistry Spectrum name: 101F_17NOV2004_1750.An1

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
1764.39	29.	21.20	0.98	2.481E-03	1764.51	15.920	6.733E-01	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
148.13	74.72	464.	130.	0.065	74.83	1.004	BI-207	D
153.99	77.64	303.	366.	0.183	25.54	1.007	PB-214	D
419.17	209.75	306.	72.	0.036	120.55	1.305	NP-239	
477.15	238.69	132.	664.	0.332	13.77	1.122	PB-212	D
483.60	241.91	135.	117.	0.058	50.54	1.124	PB-214	D
554.49	277.38	210.	88.	0.044	77.29	1.742	TL-208	s
600.13	300.19	106.	43.	0.022	112.56	1.125	PB-212	
656.00	328.11	112.	49.	0.025	106.72	1.177	AC-228	
1589.94	794.86	57.	35.	0.018	103.91	1.462	AC-228	s
1930.20	964.83	20.	37.	0.019	70.87	1.613	AC-228	D

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-212	149.26	74.84	984.	158.	0.079	87.61	1.499s
PB-214	153.79	77.11	834.	326.	0.163	41.10	1.499D
PB-212	153.79	77.11	834.	326.	0.163	41.10	1.499D
EU-155	174.17	87.30	827.	111.	0.056	113.50	1.499
TH-234	185.64	93.03	759.	143.	0.072	85.39	1.499s
TH-234	185.60	93.01	728.	144.	0.072	83.54	1.499s
RA-226	371.64	185.99	409.	110.	0.055	82.85	1.499D
PB-212	477.14	238.72	358.	548.	0.274	19.45	1.499
RA-224	483.32	241.81	440.	101.	0.050	93.33	1.499
PB-214	590.50	295.38	164.	192.	0.096	35.54	1.499
AC-228	676.67	338.44	172.	154.	0.077	51.15	1.021
PB-214	703.71	351.96	117.	258.	0.129	25.81	1.499s
SB-125	926.36	463.23	70.	53.	0.027	78.40	1.499s
TL-208	1021.53	510.80	101.	73.	0.037	68.09	1.499s
TL-208	1166.63	583.31	63.	197.	0.098	27.35	1.499
BI-214	1218.99	609.48	65.	244.	0.122	26.48	1.227s
CS-137	1323.73	661.82	78.	223.	0.111	30.49	1.585
BI-212	1455.13	727.49	37.	46.	0.023	79.65	1.396

Yankee Chemistry Spectrum name: 101F_17NOV2004_1750.An1

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
AC-228	1822.80	911.22	28.	167.	0.083	30.75	1.962s
AC-228	1938.21	968.90	16.	78.	0.039	40.25	1.616D
BI-214	2240.33	1119.87	39.	76.	0.038	58.07	1.713s
K-40	2922.50	1460.74	4.	454.	0.227	14.34	2.216
BI-214	3530.22	1764.39	2.	29.	0.014	63.60	0.981s

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	Peak MDA Value pCi/gm	COMMENTS
BE-7		7.4849E-02					
			477.56	7.485E-02	&(	5.424E-01 1.57E-01 G	
K-40		1.3420E+01					
			1460.75	1.342E+01	(	3.448E-01 6.42E-01 G	
MN-54		-1.0541E-02					
			834.81	-1.054E-02	%(	6.369E-02 1.83E-02 G	
CO-57		-6.9093E-04					
			122.07	-6.909E-04	&(P	6.254E-02 1.85E-02 G K	
			136.43	-1.221E-03	&	5.109E-01 1.52E-01 G	
CO-60		-7.3530E-03					
			1332.51	-7.353E-03	%(P	6.592E-02 1.53E-02 G K	
			1173.23	2.846E-02	% P	7.947E-02 2.26E-02 G K	
Sr-85		-8.9470E-03					
			514.00	-8.947E-03	%(	7.122E-02 2.08E-02 G	
Kr-85		-2.0046E+02					
			513.99	-2.005E+02	%(	1.523E+03 4.45E+02 G	
Y-88		4.7639E-03					
			1836.01	4.764E-03	&(P	6.728E-02 1.75E-02 G K	
			898.02	1.104E-03	% P	5.516E-02 1.48E-02 G	
NB-94		-9.3890E-03					
			871.10	-9.389E-03	%(	5.877E-02 1.68E-02 G K	
			702.50	-7.645E-04	%	4.290E-02 1.17E-02 G K	

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
Ag-108M	-4.8679E-03						
		722.95	-4.868E-03	%(	6.184E-02	1.75E-02	G K
		614.37	1.384E-03	%	6.855E-02	1.95E-02	G
		433.93	-1.601E-03	&	5.159E-02	1.48E-02	G
CD-109	-5.1188E-01						
		88.04	-5.119E-01	%(	1.732E+00	5.21E-01	G
SN-113	7.4134E-03						
		391.71	7.413E-03	&(P	8.288E-02	2.41E-02	G K
		255.04	2.876E-01	&	2.385E+00	7.04E-01	G
SB-125	1.7052E-01						
		427.95	2.719E-02	&(	1.625E-01	4.74E-02	G K
		600.77	-6.026E-02	%	2.973E-01	8.66E-02	G
		636.15	1.018E-02	%	3.926E-01	1.09E-01	G
		463.51	5.948E-01	*(	4.662E-01	1.55E-01	G
		176.29	1.566E-01	%	6.908E-01	2.06E-01	G
I-131	3.7232E-03						
		364.48	3.723E-03	&(	1.142E-01	3.31E-02	G K
		636.97	6.895E-02	%	1.202E+00	3.37E-01	G
		284.29	3.844E-01	&	1.483E+00	4.42E-01	G
CS-134	-3.1619E-03						
		604.66	-3.162E-03	&(	1.329E-01	3.92E-02	G K
		795.76	4.615E-02	%	6.227E-02	1.98E-02	G
		569.29	5.370E-02	%	3.128E-01	9.03E-02	G
		801.84	-1.259E-01	%	6.627E-01	1.91E-01	G
CS-137	4.1243E-01						
		661.62	4.124E-01	(	8.138E-02	4.19E-02	G
CE-139	2.0681E-03						
		165.85	2.068E-03	%(P	6.130E-02	1.81E-02	G
EU-152	-7.7271E-04						
		121.78	-7.727E-04	%(	1.768E-01	5.24E-02	G K
		344.30	3.289E-03	&	1.902E-01	5.53E-02	G
		1408.08	-1.777E-03	&	3.138E-01	8.35E-02	G
		964.00	-1.554E-02	&	5.736E-01	1.62E-01	G
		1112.07	-1.083E-01	%	5.362E-01	1.54E-01	G
		778.90	3.522E-02	%	4.013E-01	1.12E-01	G
EU-154	9.3383E-03						
		123.10	9.338E-03	%(	1.199E-01	3.56E-02	G K
		1274.80	-5.247E-03	&	2.056E-01	5.63E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
		723.30	4.952E-03	%	3.211E-01	9.06E-02	G
		1004.80	-5.614E-02	&	4.373E-01	1.25E-01	G
EU-155	1.6567E-01						
		86.45	1.657E-01	(	2.040E-01	6.27E-02	G K
		105.31	8.046E-02	%	2.329E-01	7.02E-02	G
HG-203	-1.7696E-02						
		279.17	-1.770E-02	&(P	7.379E-02	2.17E-02	G K
		72.87	-5.437E-01	%	1.638E+00	4.94E-01	G
		70.83	-2.073E-02	&	3.390E+00	1.01E+00	G
		82.50	-4.533E-01	%	3.457E+00	1.03E+00	G
TL-208	3.3517E-01						
		583.14	3.186E-01	(	6.408E-02	2.90E-02	G
		510.72	3.984E-01	@(	2.701E-01	9.04E-02	G
PB-212	7.5986E-01						
		238.63	7.599E-01	(	1.259E-01	4.93E-02	G K
							Energy duplication
		77.11	1.007E+00	+	4.242E-01	1.38E-01	G
		74.81	9.247E-01	&	8.720E-01	2.70E-01	G
PB-214	6.3557E-01						
		351.99	5.912E-01	@(	1.218E-01	5.09E-02	G K
		295.22	7.214E-01	(	2.336E-01	8.55E-02	G
							Energy duplication
		77.11	1.647E+00	+	6.938E-01	2.26E-01	G
		241.92	2.491E-01	%	8.893E-01	2.67E-01	G
BI-212	6.6032E-01						
		727.17	6.603E-01	(	4.519E-01	1.75E-01	G K
		1620.56	0.000E+00	%	2.004E+00	5.05E-01	G
		785.42	-5.178E-01	%	2.525E+00	7.24E-01	G
BI-214	7.4402E-01						
		609.32	7.684E-01	@(	1.266E-01	6.78E-02	G K
		1764.51	6.733E-01	(	2.338E-01	1.43E-01	G
		1120.28	1.266E+00	+	5.301E-01	2.45E-01	G
RA-224	1.5546E+00						
		241.00	1.555E+00	(	1.551E+00	4.84E-01	G
RA-226	1.6834E+00						
							Energy duplication
		185.99	1.683E+00	@(	1.479E+00	4.65E-01	G
AC-228	1.1067E+00						
		911.07	1.204E+00	@(	1.974E-01	1.23E-01	G K
		968.90	9.838E-01	(	2.668E-01	1.32E-01	G
		338.40	1.049E+00	(	4.357E-01	1.79E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TH-227	-2.5621E-01						
		236.00	-2.562E-01	&(	5.612E-01	1.70E-01	G K
		256.25	9.214E-02	&	7.012E-01	2.07E-01	G
PA-234	9.0777E-02						
		98.44	9.078E-02	%(	2.099E-01	6.35E-02	G K
		946.00	-5.305E-03	%	3.229E-01	8.94E-02	G
		131.28	4.617E-03	&	2.629E-01	7.80E-02	G
		94.67	-8.797E-03	%	3.498E-01	1.04E-01	G
		883.24	1.494E-02	%	3.438E-01	9.18E-02	G
		926.70	3.314E-01	%	4.992E-01	1.57E-01	G
		569.26	7.890E-02	%	4.610E-01	1.33E-01	G
TH-234	1.8184E+00						
		63.29	9.743E-01	%(	2.645E+00	7.98E-01	G K
		92.80	2.238E+00	*(	2.001E+00	6.23E-01	G
		92.38	2.610E+00	*(	2.389E+00	7.43E-01	G
AM-241	6.6949E-02						
		59.54	6.695E-02	%(P	3.512E-01	1.05E-01	G

(- This peak used in the nuclide activity average.

* - Peak is too wide, but only one peak in library.
! - Peak is part of a multiplet and this area went negative during deconvolution.
? - Peak is too narrow.
@ - Peak is too wide at FW25M, but ok at FWHM.
% - Peak fails sensitivity test.
$ - Peak identified, but first peak of this nuclide failed one or more qualification tests.
+ - Peak activity higher than counting uncertainty range.
- - Peak activity lower than counting uncertainty range.
= - Peak outside analysis energy range.
& - Calculated peak centroid is not close enough to the library energy centroid for positive identification.
P - Peakbackground subtraction
} - Peak is too close to another for the activity to be found directly.

Nuclide Codes:	Peak Codes:
T - Thermal Neutron Activation	G - Gamma Ray
F - Fast Neutron Activation	X - X-Ray
I - Fission Product	P - Positron Decay
N - Naturally Occurring Isotope	S - Single-Escape
P - Photon Reaction	D - Double-Escape
C - Charged Particle Reaction	K - Key Line
M - No MDA Calculation	A - Not in Average

R - Coincidence Corrected C - Coincidence Peak
H - Halflife limit exceeded

- -

***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	6.8083E-02	7.4849E-02	4.7241E-01	4.7243E-01	4.934E-01
K-40		1.3420E+01	1.3420E+01	1.9247E+00	2.0687E+00	
MN-54	#A	-1.0371E-02	-1.0541E-02	5.4856E-02	5.4859E-02	6.266E-02
CO-57	#B	-6.7810E-04	-6.9093E-04	1.4675E-01	1.4675E-01	6.138E-02
CO-60	#B	-7.3337E-03	-7.3530E-03	1.0398E-01	1.0398E-01	6.575E-02
Sr-85	#A	-8.2753E-03	-8.9470E-03	6.2399E-02	6.2401E-02	6.587E-02
Kr-85	#A	-2.0045E+02	-2.0046E+02	1.3350E+03	1.3351E+03	1.523E+03
Y-88	#B	4.5430E-03	4.7639E-03	5.2464E-02	5.2464E-02	6.416E-02
NB-94	#B	-9.3890E-03	-9.3890E-03	5.0269E-02	5.0271E-02	5.877E-02
Ag-108M	#B	-4.8674E-03	-4.8679E-03	5.2456E-02	5.2457E-02	6.183E-02
CD-109	#A	-5.0620E-01	-5.1188E-01	1.5644E+00	1.5647E+00	1.713E+00
SN-113	#B	7.0946E-03	7.4134E-03	7.2199E-02	7.2200E-02	7.932E-02
SB-125	#F	1.6967E-01	1.7052E-01	1.3368E-01	1.3403E-01	1.616E-01
I-131	#B	1.9842E-03	3.7232E-03	9.9282E-02	9.9282E-02	6.085E-02
CS-134	#B	-3.1408E-03	-3.1619E-03	1.1754E-01	1.1754E-01	1.320E-01
CS-137		4.1224E-01	4.1243E-01	1.2576E-01	1.2791E-01	
CE-139	#A	1.9934E-03	2.0681E-03	5.4397E-02	5.4397E-02	5.908E-02
EU-152	#B	-7.7186E-04	-7.7271E-04	1.5731E-01	1.5731E-01	1.766E-01
EU-154	#B	9.3231E-03	9.3383E-03	1.0693E-01	1.0693E-01	1.197E-01
EU-155	#A	1.6521E-01	1.6567E-01	1.8804E-01	1.8826E-01	2.034E-01
HG-203	#B	-1.5875E-02	-1.7696E-02	1.1314E-01	1.1314E-01	6.619E-02
TL-208	#	3.3517E-01	3.3517E-01	9.1664E-02	9.3599E-02	6.408E-02
PB-212	#	7.5986E-01	7.5986E-01	1.4776E-01	1.5387E-01	1.259E-01
PB-214	#	6.3557E-01	6.3557E-01	1.3957E-01	1.4412E-01	1.218E-01
BI-212		6.6032E-01	6.6032E-01	5.2595E-01	5.2727E-01	
BI-214		7.4402E-01	7.4402E-01	1.9700E-01	2.0143E-01	
RA-224	#	1.5546E+00	1.5546E+00	1.4509E+00	1.4535E+00	1.551E+00
RA-226	#	1.6834E+00	1.6834E+00	1.3947E+00	1.3979E+00	1.479E+00
AC-228		1.1067E+00	1.1067E+00	2.6556E-01	2.7282E-01	
TH-227	#B	-2.5621E-01	-2.5621E-01	5.0997E-01	5.1018E-01	5.612E-01
PA-234	#B	9.0777E-02	9.0777E-02	1.9058E-01	1.9065E-01	2.099E-01
TH-234	#B	1.8184E+00	1.8184E+00	1.5191E+00	1.5225E+00	2.645E+00
AM-241	#A	6.6947E-02	6.6949E-02	3.1521E-01	3.1523E-01	3.512E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.

H - Halflife limit exceeded

Yankee Chemistry Spectrum name: 101F_17NOV2004_1750.An1

---------- S U M M A R Y ----------

Total Activity (1120.2 to 1999.1 keV) 1.6343250E+01 pCi/gm
Total Decayed Activity (1120.2 to 1999.1 keV) 1.6343441E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
VSB

Reviewed by: _____
Supervisor

Laboratory: Yankee Chemistry

Yankee Chemistry Spectrum name: 101F_17NOV2004_1825.An1

Sample description
FSS-OOL-05-01-014-F SOIL

Spectrum Filename: C:\My Documents\FSS_ReanalysisArea\101F_17NOV2004_1825.An1

Acquisition information
Start time: 17-Nov-2004 18:17:42
Live time: 2000
Real time: 2002
Dead time: 0.12 %
Detector ID: 1

Detector system
Det 101- DSPE-633

Calibration
Filename: D1_1LSa.Clb
Detector 101 1.0 Liter Marinelli Sand

Energy Calibration
Created: 03-Sep-2004 08:50:48
Zero offset: 0.244 keV
Gain: 0.500 keV/channel
Quadratic: -2.493E-08 keV/channel^2

Efficiency Calibration
Created: 03-Sep-2004 08:52:26
Type: Polynomial
Uncertainty: 0.626 %
Coefficients: -0.321775 -5.816463 0.734234
-0.099357 0.006049 -0.000149

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.23keV)
Stop channel: 4000 (1999.11keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 1.5600E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.5600E+03) =
6.4103E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00

```
Systematic error:           1.0000000E+00
Fraction Limit:             0.000%
```

Yankee Chemistry Spectrum name: 101F_17NOV2004_1825.An1

Background width: average of five points.
Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	10-Nov-2004 13:50:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	1010K_Background_Det101.Pbc 17-May-2004 16:32:19
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 13 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.0641

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
74.76	122.	35.52	1.50	1.654E-02	72.87	6.400	1.158E+00	HG203
					74.81	9.600	6.667E-01	PB212
77.03	219.	19.06	1.50	1.720E-02	77.11	17.500	6.310E-01	PB212
					77.11	10.700	1.032E+00	PB214
77.03	219.	19.06	1.50	1.720E-02	77.11	17.500	6.310E-01	PB212
					77.11	10.700	1.032E+00	PB214
92.94	109.	33.67	1.50	1.989E-02	92.38	2.570	1.843E+00	TH234
					92.80	3.000	1.576E+00	TH234
130.52	78.	36.20	1.59	2.107E-02				
130.52	78.	36.20	1.59	2.107E-02	131.28	20.000	1.596E-01	PA234
186.05	82.	36.56	0.64	1.858E-02	185.99	3.280	1.158E+00	RA226
209.17	52.	38.94	0.84	1.722E-02				
239.12	554.	7.90	1.06	1.555E-02	238.63	43.100	7.143E-01	PB212
270.07	58.	38.02	0.78	1.401E-02				
295.01	175.	13.25	1.20	1.293E-02				
295.01	175.	13.25	1.20	1.293E-02	295.22	19.200	6.104E-01	PB214
338.26	126.	21.11	1.27	1.135E-02	338.40	12.010	7.982E-01	AC228
351.98	234.	10.79	0.94	1.092E-02				
351.98	234.	10.79	0.94	1.092E-02	351.99	37.100	4.993E-01	PB214
510.37	110.	18.13	1.99	7.595E-03	510.72	22.500	5.600E-01	TL208
583.18	152.	11.53	1.30	6.684E-03	583.14	86.000	2.287E-01	TL208
609.40	155.	11.71	1.37	6.412E-03	609.32	46.090	4.546E-01	BI214
661.69	489.	5.85	1.33	5.937E-03	661.62	84.620	8.442E-01	CS137
727.00	35.	35.46	0.85	5.443E-03	727.17	11.800	4.667E-01	BI212
911.11	119.	11.44	1.99	4.446E-03	911.07	29.000	7.967E-01	AC228
967.79	79.	19.15	1.82	4.216E-03	968.90	17.460	9.282E-01	AC228

1120.44	37.	28.68	2.20	3.711E-03	1120.28	15.040	5.743E-01	BI214
1460.68	385.	5.53	2.01	2.943E-03	1460.75	10.700	1.060E+01	K40
1764.31	13.	35.62	2.11	2.481E-03	1764.51	15.920	2.890E-01	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
260.65	130.52	309.	78.	0.039	108.61	1.591	PA-234	l
371.76	186.05	322.	82.	0.041	109.68	0.638	PA-234	l
418.01	209.17	179.	52.	0.026	116.82	0.840	AC-228	
477.93	239.12	788.	153.	0.076	81.59	1.062	PB-212	s
539.86	270.07	160.	58.	0.029	114.06	0.781	AC-228	

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-212	149.10	74.76	881.	122.	0.061	106.57	1.499
PB-212	153.79	77.11	764.	219.	0.110	57.17	1.499D
PB-214	153.79	77.11	764.	219.	0.110	57.17	1.499D
TH-234	185.50	92.96	626.	110.	0.055	100.40	1.499s
TH-234	185.47	92.94	614.	109.	0.054	101.02	1.499s
PB-212	477.19	238.75	370.	358.	0.179	27.78	1.499
PB-214	590.22	295.24	144.	153.	0.076	41.24	1.499s
AC-228	676.31	338.26	180.	126.	0.063	63.32	1.265s
PB-214	703.78	351.99	98.	180.	0.090	32.29	1.499D
TL-208	1020.69	510.37	81.	110.	0.055	54.39	1.995s
TL-208	1166.37	583.18	53.	152.	0.076	34.58	1.297
BI-214	1218.84	609.40	53.	155.	0.078	35.12	1.372
CS-137	1323.47	661.69	81.	489.	0.245	17.55	1.329
BI-212	1454.16	727.00	41.	35.	0.017	106.38	0.853s
AC-228	1822.56	911.11	23.	119.	0.059	34.32	1.988s
AC-228	1935.99	967.79	39.	79.	0.039	57.46	1.823s
BI-214	2241.47	1120.44	27.	37.	0.019	86.04	2.203s
K-40	2922.37	1460.68	13.	385.	0.193	16.59	2.008
BI-214	3530.07	1764.31	4.	13.	0.007	106.87	2.106s

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	MDA Value pCi/gm	COMMENTS
BE-7		1.8974E-01					
			477.56	1.897E-01	%(	4.087E-01 1.24E-01	G
K-40		1.0596E+01					
			1460.75	1.060E+01	(	5.351E-01 5.86E-01	G
MN-54		1.2934E-03					
			834.81	1.293E-03	%(	4.627E-02 1.26E-02	G
CO-57		-1.1622E-03					
			122.07	-1.162E-03	%(P	5.298E-02 1.57E-02	G K
			136.43	2.430E-02	%	3.795E-01 1.12E-01	G
CO-60		-1.7028E-03					
			1332.51	-1.703E-03	%(P	6.915E-02 1.73E-02	G K
			1173.23	-1.684E-02	& P	9.153E-02 2.41E-02	G K
Sr-85		-2.8323E-02					
			514.00	-2.832E-02	&(	6.617E-02 2.00E-02	G
Kr-85		-6.0553E+02					
			513.99	-6.055E+02	&(	1.415E+03 4.27E+02	G
Y-88		-9.4226E-04					
			1836.01	-9.423E-04	%(P	2.815E-02 3.82E-03	G K
			898.02	2.344E-03	& P	5.970E-02 1.64E-02	G
NB-94		9.4625E-04					
			871.10	9.462E-04	%(	4.121E-02 1.10E-02	G K
			702.50	1.641E-03	%	5.596E-02 1.58E-02	G K
Ag-108M		-2.6922E-03					
			722.95	-2.692E-03	%(	6.108E-02 1.72E-02	G K
			614.37	-1.630E-02	%	6.109E-02 1.80E-02	G
			433.93	1.173E-02	%	4.683E-02 1.38E-02	G
CD-109		4.6161E-02					
			88.04	4.616E-02	%(	1.563E+00 4.65E-01	G
SN-113		-4.7626E-03					
			391.71	-4.763E-03	&(P	5.627E-02 1.59E-02	G K
			255.04	2.708E-01	&	2.076E+00 6.12E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	3.4705E-03						
		427.95	3.471E-03	%(	1.833E-01	5.31E-02	G K
		600.77	5.875E-02	&	2.092E-01	6.11E-02	G
		636.15	-2.605E-03	&	4.172E-01	1.16E-01	G
		463.51	2.730E-01	%	4.602E-01	1.42E-01	G
		176.29	9.663E-02	%	6.468E-01	1.92E-01	G
I-131	2.9873E-03						
		364.48	2.987E-03	%(	9.982E-02	2.88E-02	G K
		636.97	5.588E-02	&	8.448E-01	2.31E-01	G
		284.29	-3.778E-01	%	1.377E+00	4.11E-01	G
CS-134	-6.3624E-03						
		604.66	-6.362E-03	%(	4.817E-02	1.38E-02	G K
		795.76	3.274E-02	%	4.979E-02	1.57E-02	G
		569.29	8.577E-02	%	2.291E-01	6.81E-02	G
		801.84	1.538E-02	%	5.276E-01	1.45E-01	G
CS-137	8.4417E-01						
		661.62	8.442E-01	(	7.684E-02	4.94E-02	G
CE-139	-8.8956E-03						
		165.85	-8.896E-03	%(P	5.320E-02	1.58E-02	G
EU-152	-9.4768E-03						
		121.78	-9.477E-03	%(	1.497E-01	4.44E-02	G K
		344.30	-1.158E-02	%	1.622E-01	4.72E-02	G
		1408.08	4.560E-02	&	2.003E-01	5.55E-02	G
		964.00	1.250E-03	%	4.926E-01	1.38E-01	G
		1112.07	-5.928E-03	%	4.660E-01	1.28E-01	G
		778.90	4.682E-04	%	3.500E-01	9.55E-02	G
EU-154	-1.7364E-02						
		123.10	-1.736E-02	&(	1.078E-01	3.21E-02	G K
		1274.80	-1.379E-02	&	1.884E-01	5.21E-02	G
		723.30	-4.565E-03	%	2.547E-01	7.09E-02	G
		1004.80	-2.736E-02	%	3.224E-01	8.98E-02	G
EU-155	1.6269E-02						
		86.45	1.627E-02	&(	1.806E-01	5.39E-02	G K
		105.31	4.833E-02	%	2.122E-01	6.36E-02	G
HG-203	-4.5920E-03						
		279.17	-4.592E-03	&(P	5.726E-02	1.64E-02	G K
		72.87	-1.847E-01	%	1.435E+00	4.30E-01	G
		70.83	5.490E-01	%	2.347E+00	7.05E-01	G
		82.50	5.657E-01	%	2.453E+00	7.34E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	2.2874E-01						
		583.14	2.287E-01	(	5.530E-02	2.64E-02	G
		510.72	5.600E-01	+	2.259E-01	1.01E-01	G
PB-212	4.6149E-01						
		238.63	4.615E-01	(	1.191E-01	4.27E-02	G K
							Energy duplication
		77.11	6.310E-01	+	3.783E-01	1.20E-01	G
		74.81	6.667E-01	&	7.695E-01	2.37E-01	G
PB-214	3.8495E-01						
							Energy duplication
		351.99	3.849E-01	(	1.043E-01	4.14E-02	G K
		295.22	5.334E-01	+	2.048E-01	7.33E-02	G
							Energy duplication
		77.11	1.032E+00	+	6.187E-01	1.97E-01	G
		241.92	-9.241E-03	%	8.242E-01	2.44E-01	G
BI-212	4.6666E-01						
		727.17	4.667E-01	(	4.410E-01	1.65E-01	G K
		1620.56	0.000E+00	%	8.657E-01	1.17E-01	G
		785.42	5.690E-01	%	2.093E+00	6.07E-01	G
BI-214	4.8403E-01						
		609.32	4.546E-01	(	1.073E-01	5.32E-02	G K
		1764.51	2.890E-01	-	2.745E-01	1.03E-01	G
		1120.28	5.743E-01	(	4.179E-01	1.65E-01	G
RA-224	6.1814E-01						
		241.00	6.181E-01	&(	1.436E+00	4.34E-01	G
RA-226	8.7456E-01						
		185.99	8.746E-01	%(	1.365E+00	4.18E-01	G
AC-228	8.3628E-01						
		911.07	7.967E-01	(	1.696E-01	9.12E-02	G K
		968.90	9.282E-01	*(	3.756E-01	1.78E-01	G
		338.40	7.982E-01	*(	4.150E-01	1.69E-01	G
TH-227	-1.6411E-01						
		236.00	-1.641E-01	&(	5.249E-01	1.58E-01	G K
		256.25	2.070E-02	&	5.912E-01	1.73E-01	G
PA-234	-4.3729E-03						
		98.44	-4.373E-03	&(	1.774E-01	5.25E-02	G K
		946.00	-1.296E-02	%	2.431E-01	6.65E-02	G
		131.28	6.051E-02	%	2.067E-01	6.20E-02	G
		94.67	-3.778E-02	%	2.694E-01	8.01E-02	G
		883.24	5.323E-02	%	2.802E-01	7.77E-02	G
		926.70	5.789E-02	%	3.905E-01	1.09E-01	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26 1.273E-01 %   3.372E-01 1.00E-01 G

TH-234       1.5885E+00
                           63.29 1.411E+00 %(  2.358E+00 7.19E-01 G K
                           92.80 1.576E+00  (  1.715E+00 5.31E-01 G
                           92.38 1.872E+00  (  2.025E+00 6.27E-01 G

AM-241      -7.2305E-04
                           59.54-7.230E-04 %(P 3.478E-01 1.03E-01 G
   ( - This peak used in the nuclide activity average.

   * - Peak is too wide, but only one peak in library.
   ! - Peak is part of a multiplet and this area went
       negative during deconvolution.
   ? - Peak is too narrow.
   @ - Peak is too wide at FW25M, but ok at FWHM.
   % - Peak fails sensitivity test.
   $ - Peak identified, but first peak of this nuclide
       failed one or more qualification tests.
   + - Peak activity higher than counting uncertainty range.
   - - Peak activity lower than counting uncertainty range.
   = - Peak outside analysis energy range.
   & - Calculated peak centroid is not close enough to the
       library energy centroid for positive identification.
   P - Peakbackground subtraction
   } - Peak is too close to another for the activity
       to be found directly.

   Nuclide Codes:                      Peak Codes:
   T - Thermal Neutron Activation      G - Gamma Ray
   F - Fast Neutron Activation         X - X-Ray
   I - Fission Product                 P - Positron Decay
   N - Naturally Occurring Isotope     S - Single-Escape
   P - Photon Reaction                 D - Double-Escape
   C - Charged Particle Reaction       K - Key Line
   M - No MDA Calculation              A - Not in Average
   R - Coincidence Corrected           C - Coincidence Peak
   H - Halflife limit exceeded

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
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***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	1.7284E-01	1.8974E-01	3.7115E-01	3.7131E-01	3.723E-01
K-40		1.0596E+01	1.0596E+01	1.7577E+00	1.8569E+00	
MN-54	#A	1.2729E-03	1.2934E-03	3.7887E-02	3.7887E-02	4.554E-02
CO-57	#B	-1.1409E-03	-1.1622E-03	1.6356E-01	1.6356E-01	5.201E-02
CO-60	#B	-1.6984E-03	-1.7028E-03	6.2951E-02	6.2951E-02	6.897E-02

Sr-85	#A	-2.6229E-02	-2.8323E-02	5.9881E-02	5.9902E-02	6.128E-02
Kr-85	#A	-6.0550E+02	-6.0553E+02	1.2802E+03	1.2807E+03	1.415E+03
Y-88	#B	-8.9924E-04	-9.4226E-04	5.6536E-03	5.6538E-03	2.687E-02
NB-94	#B	9.4625E-04	9.4625E-04	3.3138E-02	3.3138E-02	4.121E-02
Ag-108M	#B	-2.6919E-03	-2.6922E-03	5.1708E-02	5.1708E-02	6.108E-02
CD-109	#A	4.5657E-02	4.6161E-02	1.3951E+00	1.3951E+00	1.546E+00
SN-113	#B	-4.5609E-03	-4.7626E-03	1.0147E-01	1.0147E-01	5.389E-02
SB-125	#B	3.4535E-03	3.4705E-03	1.5918E-01	1.5918E-01	1.824E-01
I-131	#B	1.6078E-03	2.9873E-03	8.6540E-02	8.6540E-02	5.372E-02
CS-134	#B	-6.3204E-03	-6.3624E-03	4.1407E-02	4.1408E-02	4.785E-02
CS-137		8.4379E-01	8.4417E-01	1.4817E-01	1.5566E-01	
CE-139	#A	-8.5791E-03	-8.8956E-03	4.8355E-02	4.8358E-02	5.130E-02
EU-152	#B	-9.4666E-03	-9.4768E-03	1.3324E-01	1.3324E-01	1.495E-01
EU-154	#B	-1.7336E-02	-1.7364E-02	9.6440E-02	9.6445E-02	1.076E-01
EU-155	#B	1.6224E-02	1.6269E-02	1.6167E-01	1.6167E-01	1.802E-01
HG-203	#B	-4.1264E-03	-4.5920E-03	2.8427E+00	2.8427E+00	5.145E-02
TL-208		2.2874E-01	2.2874E-01	7.9089E-02	8.0138E-02	
PB-212	#	4.6149E-01	4.6149E-01	1.2820E-01	1.3083E-01	1.191E-01
PB-214	#	3.8495E-01	3.8495E-01	1.2428E-01	1.2617E-01	1.043E-01
BI-212		4.6666E-01	4.6666E-01	4.9642E-01	4.9712E-01	
BI-214		4.8403E-01	4.8403E-01	1.6999E-01	1.7218E-01	
RA-224	#A	6.1814E-01	6.1814E-01	1.3033E+00	1.3037E+00	1.436E+00
RA-226	#A	8.7456E-01	8.7456E-01	1.2534E+00	1.2544E+00	1.365E+00
AC-228	#	8.3628E-01	8.3628E-01	2.5684E-01	2.6115E-01	
TH-227	#B	-1.6411E-01	-1.6411E-01	4.7350E-01	4.7359E-01	5.249E-01
PA-234	#B	-4.3729E-03	-4.3729E-03	1.5756E-01	1.5756E-01	1.774E-01
TH-234	#B	1.5885E+00	1.5885E+00	1.1062E+00	1.1097E+00	2.358E+00
AM-241	#A	-7.2302E-04	-7.2305E-04	1.6036E-01	1.6036E-01	3.478E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (50.2 to 1999.1 keV) 1.3455036E+01 pCi/gm
Total Decayed Activity (50.2 to 1999.1 keV) 1.3455419E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
VSB

Reviewed by: _____
Supervisor

Laboratory: Yankee Chemistry

Yankee Chemistry Spectrum name: 101F_17NOV2004_1900.An1

Sample description
FSS-OOL-05-01-001-F SOIL

Spectrum Filename: C:\My Documents\FSS_ReanalysisArea\101F_17NOV2004_1900.An1

Acquisition information
Start time: 17-Nov-2004 18:54:46
Live time: 2000
Real time: 2002
Dead time: 0.12 %
Detector ID: 1

Detector system
Det 101- DSPE-633

Calibration
Filename: D1_1LSa.Clb
Detector 101 1.0 Liter Marinelli Sand

Energy Calibration
Created: 03-Sep-2004 08:50:48
Zero offset: 0.244 keV
Gain: 0.500 keV/channel
Quadratic: -2.493E-08 keV/channel^2

Efficiency Calibration
Created: 03-Sep-2004 08:52:26
Type: Polynomial
Uncertainty: 0.626 %
Coefficients: -0.321775 -5.816463 0.734234
-0.099357 0.006049 -0.000149

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.23keV)
Stop channel: 4000 (1999.11keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 1.3370E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.3370E+03) =
7.4794E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00

```
Systematic error:           1.0000000E+00
Fraction Limit:             0.000%
```

Yankee Chemistry Spectrum name: 101F_17NOV2004_1900.An1

Background width: average of five points.
Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	10-Nov-2004 09:24:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	1010K_Background_Det101.Pbc 17-May-2004 16:32:19
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 12 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.0379

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
74.45	146.	17.73	1.00	1.653E-02				
74.45	146.	17.73	1.00	1.653E-02	74.81	9.600	9.306E-01	PB212
77.39	218.	12.28	1.01	1.736E-02	77.11	10.700	1.199E+00	PB214
					77.11	17.500	7.334E-01	PB212
83.86	62.	34.17	1.01	1.866E-02				
86.66	93.	25.05	1.01	1.912E-02	86.45	32.740	1.513E-01	EU155
89.96	79.	26.26	1.02	1.957E-02	88.04	3.790	1.099E+00	CD109
93.25	111.	20.97	1.02	1.993E-02	92.38	2.570	2.205E+00	TH234
					92.80	3.000	1.885E+00	TH234
186.36	116.	26.15	0.90	1.856E-02	185.99	3.280	1.920E+00	RA226
209.16	86.	33.64	0.81	1.722E-02				
238.70	578.	4.84	1.12	1.557E-02	238.63	43.100	8.709E-01	PB212
241.64	74.	25.40	1.12	1.541E-02	241.00	3.900	1.236E+00	RA224
					241.92	7.470	6.475E-01	PB214
295.33	100.	18.74	0.99	1.292E-02	295.22	19.200	4.095E-01	PB214
338.37	132.	20.23	1.27	1.135E-02				
338.37	132.	20.23	1.27	1.135E-02	338.40	12.010	9.825E-01	AC228
351.71	253.	10.16	1.28	1.093E-02				
351.71	253.	10.16	1.28	1.093E-02	351.99	37.100	6.317E-01	PB214
510.74	67.	25.37	1.39	7.590E-03	510.72	22.500	3.965E-01	TL208
583.14	167.	11.82	1.41	6.684E-03	583.14	86.000	2.940E-01	TL208
609.37	166.	11.45	1.29	6.412E-03	609.32	46.090	5.690E-01	BI214
661.71	176.	9.41	1.31	5.937E-03	661.62	84.620	3.546E-01	CS137
727.13	48.	29.49	0.89	5.443E-03	727.17	11.800	7.475E-01	BI212
911.25	81.	12.44	1.52	4.446E-03	911.07	29.000	6.380E-01	AC228
1119.58	45.	23.05	2.43	3.711E-03	1120.28	15.040	8.186E-01	BI214

1460.69	389.	5.07	2.00	2.943E-03	1460.75	10.700	1.249E+01	K40
1764.39	10.	39.06	2.11	2.481E-03	1764.51	15.920	PBC<MDA	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
148.47	74.78	263.	146.	0.073	53.19	1.005	BI-207	D
154.35	77.72	251.	218.	0.109	36.84	1.007	PB-214	D
167.29	83.80	196.	62.	0.031	102.50	1.011	TA-182	lD
172.90	86.61	227.	93.	0.047	75.14	1.013	BI-207	lD
179.49	89.90	174.	79.	0.039	78.77	1.016	PB-214	lD
417.99	209.16	275.	86.	0.043	100.92	0.806	AC-228	
477.10	238.74	103.	578.	0.289	14.53	1.122	PB-212	D
482.99	241.68	138.	74.	0.037	76.19	1.124	PB-214	D

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-212	149.06	74.75	694.	139.	0.069	84.58	1.499s
PB-214	153.79	77.11	591.	182.	0.091	60.84	1.499D
PB-212	153.79	77.11	591.	182.	0.091	60.84	1.499D
TH-234	185.66	93.04	505.	124.	0.062	81.70	1.499
TH-234	185.63	93.02	486.	123.	0.062	80.54	1.499
RA-226	371.85	186.10	298.	71.	0.035	109.83	1.499s
PB-212	477.17	238.73	225.	458.	0.229	19.75	1.499
RA-224	482.92	241.61	290.	67.	0.033	114.62	1.499s
PB-214	590.21	295.23	138.	84.	0.042	67.96	1.499
AC-228	676.64	338.43	108.	100.	0.050	53.19	1.499
PB-214	703.79	352.00	88.	193.	0.096	29.94	1.499s
TL-208	1021.42	510.74	62.	52.	0.026	76.81	1.499s
TL-208	1166.29	583.14	43.	143.	0.072	31.77	1.499D
BI-214	1218.77	609.37	55.	166.	0.083	34.35	1.294
CS-137	1323.50	661.71	31.	176.	0.088	28.22	1.307
BI-212	1454.41	727.13	42.	48.	0.024	88.48	0.893s
AC-228	1823.06	911.35	9.	77.	0.039	38.08	1.578
BI-214	2239.74	1119.58	20.	45.	0.023	69.15	2.432s
K-40	2922.40	1460.69	0.	389.	0.194	15.21	2.001
BI-214	3530.22	1764.39	2.	10.	0.005	117.18	2.106s

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Code	MDA Value pCi/gm		COMMENTS
BE-7		1.6230E-01						
			477.56	1.623E-01	%(	4.386E-01	1.31E-01	G
K-40		1.2488E+01						
			1460.75	1.249E+01	(	2.366E-01	6.33E-01	G
MN-54		2.3548E-03						
			834.81	2.355E-03	&(	5.845E-02	1.61E-02	G
CO-57		1.0659E-03						
			122.07	1.066E-03	%(P	6.011E-02	1.78E-02	G K
			136.43	-1.093E-01	%	4.476E-01	1.34E-01	G
CO-60		-1.4833E-04						
			1332.51	-1.483E-04	&(P	7.805E-02	1.94E-02	G K
			1173.23	2.635E-02	% P	7.796E-02	2.18E-02	G K
Sr-85		-1.6687E-02						
			514.00	-1.669E-02	%(	7.666E-02	2.26E-02	G
Kr-85		-3.5598E+02						
			513.99	-3.560E+02	%(	1.635E+03	4.82E+02	G
Y-88		-8.0577E-03						
			1836.01	-8.058E-03	%(P	5.795E-02	1.47E-02	G K
			898.02	-6.744E-03	% P	7.129E-02	1.96E-02	G
NB-94		-7.2107E-03						
			871.10	-7.211E-03	&(	6.399E-02	1.81E-02	G K
			702.50	0.000E+00	&	4.804E-02	1.31E-02	G K
Ag-108M		-9.5738E-03						
			722.95	-9.574E-03	%(	6.472E-02	1.85E-02	G K
			614.37	-1.027E-03	%	6.088E-02	1.71E-02	G
			433.93	1.613E-02	&	5.625E-02	1.67E-02	G
CD-109		1.2190E-01						
			88.04	1.219E-01	&(	1.726E+00	5.14E-01	G
SN-113		-9.7614E-04						
			391.71	-9.761E-04	&(P	6.540E-02	1.83E-02	G K
			255.04	4.952E-01	&	1.820E+00	5.40E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	3.3117E-02						
		427.95	3.312E-02	%(	1.340E-01	3.92E-02	G K
		600.77	1.015E-01	%	2.400E-01	7.21E-02	G
		636.15	0.000E+00	%	4.461E-01	1.23E-01	G
		463.51	2.488E-01	&	4.255E-01	1.31E-01	G
		176.29	1.106E-01	&	7.411E-01	2.20E-01	G
I-131	5.4265E-03						
		364.48	5.427E-03	%(	8.639E-02	2.46E-02	G K
		636.97	-2.041E-03	%	9.877E-01	2.65E-01	G
		284.29	-5.864E-02	%	1.449E+00	4.22E-01	G
CS-134	-5.6316E-03						
		604.66	-5.632E-03	&(	7.110E-02	2.05E-02	G K
		795.76	-2.534E-03	&	9.247E-02	2.62E-02	G
		569.29	1.311E-01	%	3.140E-01	9.43E-02	G
		801.84	4.203E-02	&	5.971E-01	1.65E-01	G
CS-137	3.5463E-01						
		661.62	3.546E-01	(	5.750E-02	3.34E-02	G
CE-139	1.9102E-02						
		165.85	1.910E-02	&(P	5.769E-02	1.73E-02	G
EU-152	-3.0074E-02						
		121.78	-3.007E-02	&(	1.608E-01	4.80E-02	G K
		344.30	-4.986E-03	%	1.188E-01	3.35E-02	G
		1408.08	1.202E-01	%	2.497E-01	7.64E-02	G
		964.00	-2.388E-01	%	6.723E-01	2.01E-01	G
		1112.07	3.115E-03	&	5.448E-01	1.49E-01	G
		778.90	-3.234E-02	&	3.942E-01	1.09E-01	G
EU-154	2.8149E-02						
		123.10	2.815E-02	%(	1.129E-01	3.38E-02	G K
		1274.80	-3.673E-02	&	2.237E-01	6.34E-02	G
		723.30	-3.526E-02	%	3.002E-01	8.53E-02	G
		1004.80	9.813E-02	%	3.641E-01	1.06E-01	G
EU-155	1.3884E-01						
		86.45	1.388E-01	%(	1.897E-01	5.82E-02	G K
		105.31	7.804E-02	%	2.251E-01	6.78E-02	G
HG-203	2.0587E-02						
		279.17	2.059E-02	&(P	6.019E-02	1.79E-02	G K
		72.87	-3.308E-01	&	1.496E+00	4.49E-01	G
		70.83	-1.489E-02	%	2.210E+00	6.54E-01	G
		82.50	-2.910E-02	&	3.534E+00	1.05E+00	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	2.6322E-01						
							Energy duplication
		583.14	2.517E-01	@(	5.873E-02	2.67E-02	G
		510.72	3.071E-01	*(	2.337E-01	7.86E-02	G
PB-212	6.6679E-01						
		238.63	6.892E-01	(	1.094E-01	4.54E-02	G K
							Energy duplication
		77.11	6.116E-01	(	3.895E-01	1.24E-01	G
		74.81	8.822E-01	&	7.987E-01	2.49E-01	G
PB-214	4.8028E-01						
		351.99	4.803E-01	@(	1.160E-01	4.79E-02	G K
		295.22	3.415E-01	-	2.344E-01	7.74E-02	G
							Energy duplication
		77.11	1.000E+00	+	6.371E-01	2.03E-01	G
		241.92	-1.906E-03	%	8.878E-01	2.62E-01	G
BI-212	7.4751E-01						
		727.17	7.475E-01	(	5.207E-01	2.20E-01	G K
		1620.56	-1.847E-01	%	1.821E+00	4.68E-01	G
		785.42	3.924E-01	%	2.378E+00	6.70E-01	G
BI-214	5.6904E-01						
		609.32	5.690E-01	(	1.270E-01	6.52E-02	G K
		1764.51	2.486E-01	-	2.519E-01	9.71E-02	G
		1120.28	8.186E-01	+	4.246E-01	1.89E-01	G
RA-224	1.1156E+00						
		241.00	1.116E+00	(	1.376E+00	4.26E-01	G
RA-226	1.1703E+00						
		185.99	1.170E+00	*(	1.380E+00	4.28E-01	G
AC-228	6.4520E-01						
		911.07	6.044E-01	(	1.329E-01	7.67E-02	G K
		968.90	3.508E-01	%	4.673E-01	1.48E-01	G
		338.40	7.438E-01	(	3.792E-01	1.32E-01	G
TH-227	-1.5657E-01						
		236.00	-1.566E-01	%(	5.414E-01	1.62E-01	G K
		256.25	6.767E-02	&	6.390E-01	1.87E-01	G
PA-234	-4.2041E-03						
		98.44	-4.204E-03	%(	2.117E-01	6.27E-02	G K
		946.00	-2.820E-02	%	3.116E-01	8.68E-02	G
		131.28	4.649E-02	%	2.346E-01	7.00E-02	G
		94.67	-1.526E-01	%	3.798E-01	1.15E-01	G
		883.24	9.573E-03	%	4.889E-01	1.34E-01	G
		926.70	-9.242E-02	&	5.767E-01	1.64E-01	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26 1.932E-01 %   4.626E-01 1.39E-01 G

TH-234       1.5450E+00
                           63.29 5.304E-01 &(  2.257E+00 6.75E-01 G K
                           92.80 2.089E+00  (  1.787E+00 5.61E-01 G
                           92.38 2.450E+00  (  2.129E+00 6.67E-01 G

AM-241      -4.5132E-02
                           59.54-4.513E-02 &(P 3.585E-01 1.07E-01 G
   ( - This peak used in the nuclide activity average.

   * - Peak is too wide, but only one peak in library.
   ! - Peak is part of a multiplet and this area went
       negative during deconvolution.
   ? - Peak is too narrow.
   @ - Peak is too wide at FW25M, but ok at FWHM.
   % - Peak fails sensitivity test.
   $ - Peak identified, but first peak of this nuclide
       failed one or more qualification tests.
   + - Peak activity higher than counting uncertainty range.
   - - Peak activity lower than counting uncertainty range.
   = - Peak outside analysis energy range.
   & - Calculated peak centroid is not close enough to the
       library energy centroid for positive identification.
   P - Peakbackground subtraction
   } - Peak is too close to another for the activity
       to be found directly.

   Nuclide Codes:                      Peak Codes:
   T - Thermal Neutron Activation      G - Gamma Ray
   F - Fast Neutron Activation         X - X-Ray
   I - Fission Product                 P - Positron Decay
   N - Naturally Occurring Isotope     S - Single-Escape
   P - Photon Reaction                 D - Double-Escape
   C - Charged Particle Reaction       K - Key Line
   M - No MDA Calculation              A - Not in Average
   R - Coincidence Corrected           C - Coincidence Peak
   H - Halflife limit exceeded

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
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***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	1.4744E-01	1.6230E-01	3.9206E-01	3.9217E-01	3.984E-01
K-40		1.2488E+01	1.2488E+01	1.8995E+00	2.0263E+00	
MN-54	#A	2.3164E-03	2.3548E-03	4.8407E-02	4.8407E-02	5.750E-02
CO-57	#B	1.0459E-03	1.0659E-03	5.3341E-02	5.3341E-02	5.898E-02
CO-60	#B	-1.4793E-04	-1.4833E-04	5.9192E-02	5.9192E-02	7.784E-02

Sr-85	#A	-1.5418E-02	-1.6687E-02	6.7823E-02	6.7830E-02	7.083E-02
Kr-85	#A	-3.5596E+02	-3.5598E+02	1.4468E+03	1.4469E+03	1.635E+03
Y-88	#B	-7.6794E-03	-8.0577E-03	5.7894E-02	5.7896E-02	5.523E-02
NB-94	#B	-7.2107E-03	-7.2107E-03	5.4194E-02	5.4195E-02	6.399E-02
Ag-108M	#B	-9.5728E-03	-9.5738E-03	5.5497E-02	5.5500E-02	6.472E-02
CD-109	#A	1.2052E-01	1.2190E-01	1.5421E+00	1.5421E+00	1.707E+00
SN-113	#B	-9.3362E-04	-9.7614E-04	1.5904E-01	1.5904E-01	6.255E-02
SB-125	#B	3.2949E-02	3.3117E-02	1.1750E-01	1.1751E-01	1.333E-01
I-131	#B	2.8681E-03	5.4265E-03	7.3897E-02	7.3897E-02	4.566E-02
CS-134	#B	-5.5934E-03	-5.6316E-03	6.1422E-02	6.1423E-02	7.062E-02
CS-137		3.5446E-01	3.5463E-01	1.0008E-01	1.0207E-01	
CE-139	#A	1.8403E-02	1.9102E-02	5.1992E-02	5.2003E-02	5.558E-02
EU-152	#B	-3.0041E-02	-3.0074E-02	1.4392E-01	1.4393E-01	1.606E-01
EU-154	#B	2.8103E-02	2.8149E-02	1.0132E-01	1.0133E-01	1.127E-01
EU-155	#B	1.3845E-01	1.3884E-01	1.7465E-01	1.7482E-01	1.892E-01
HG-203	#B	1.8442E-02	2.0587E-02	5.3619E-02	5.3631E-02	5.392E-02
TL-208	#	2.6322E-01	2.6322E-01	8.3627E-02	8.4939E-02	5.873E-02
PB-212	#	6.6679E-01	6.6679E-01	1.3168E-01	1.3697E-01	1.094E-01
PB-214	#	4.8028E-01	4.8028E-01	1.4379E-01	1.4633E-01	1.160E-01
BI-212		7.4751E-01	7.4751E-01	6.6137E-01	6.6272E-01	
BI-214		5.6904E-01	5.6904E-01	1.9545E-01	1.9808E-01	
RA-224	#A	1.1156E+00	1.1156E+00	1.2787E+00	1.2802E+00	1.376E+00
RA-226	#A	1.1703E+00	1.1703E+00	1.2853E+00	1.2870E+00	1.380E+00
AC-228	#	6.4520E-01	6.4520E-01	2.1103E-01	2.1415E-01	1.329E-01
TH-227	#B	-1.5657E-01	-1.5657E-01	4.8710E-01	4.8718E-01	5.414E-01
PA-234	#B	-4.2041E-03	-4.2041E-03	1.8806E-01	1.8806E-01	2.117E-01
TH-234	#B	1.5450E+00	1.5450E+00	1.2443E+00	1.2473E+00	2.257E+00
AM-241	#A	-4.5130E-02	-4.5132E-02	3.3247E-01	3.3248E-01	3.584E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (295.1 to 1999.1 keV) 1.4158982E+01 pCi/gm
Total Decayed Activity (295.1 to 1999.1 keV) 1.4159147E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
VSB

Reviewed by: _____
Supervisor

Laboratory: Yankee Chemistry

Yankee Chemistry Spectrum name: 101F_17NOV2004_1935.An1

Sample description
FSS-OOL-05-01-019-B SOIL

Spectrum Filename: C:\My Documents\FSS_ReanalysisArea\101F_17NOV2004_1935.An1

Acquisition information

Start time:	17-Nov-2004 19:30:50
Live time:	2000
Real time:	2003
Dead time:	0.14 %
Detector ID:	1

Detector system
Det 101- DSPE-633

Calibration
Filename: D1_1LSa.Clb
Detector 101 1.0 Liter Marinelli Sand

Energy Calibration

Created:	03-Sep-2004 08:50:48
Zero offset:	0.244 keV
Gain:	0.500 keV/channel
Quadratic:	-2.493E-08 keV/channel^2

Efficiency Calibration

Created:	03-Sep-2004 08:52:26
Type:	Polynomial
Uncertainty:	0.626 %
Coefficients:	-0.321775 -5.816463 0.734234
	-0.099357 0.006049 -0.000149

Library Files

Main analysis library:	FSS_Rev_1.Lib
Library Match Width:	1.000
Peak stripping:	Library based

Analysis parameters

Analysis engine:	Env32 G53W4.20
Start channel:	100 (50.23keV)
Stop channel:	4000 (1999.11keV)
Peak rejection level:	41.667%
Peak search sensitivity:	3
Sample Size:	1.4690E+03
Activity scaling factor:	1.0000E+06/(1.0000E+00* 1.4690E+03) = 6.8074E+02
Detection limit method:	Nureg 4.16
Random error:	1.0000000E+00

```
Systematic error:           1.0000000E+00
Fraction Limit:             0.000%
```

Yankee Chemistry Spectrum name: 101F_17NOV2004_1935.An1

Background width: average of five points.
Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	10-Nov-2004 14:55:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	1010K_Background_Det101.Pbc 17-May-2004 16:32:19
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 15 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.1348

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
75.00	162.	16.59	1.00	1.666E-02	74.81	9.600	9.370E-01	PB212
76.99	308.	9.33	1.01	1.722E-02	77.11	10.700	1.539E+00	PB214
					77.11	17.500	9.410E-01	PB212
92.98	113.	31.97	1.50	1.989E-02	92.38	2.570	2.040E+00	TH234
					92.80	3.000	1.743E+00	TH234
92.99	111.	33.17	1.50	1.985E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	1.714E+00	TH234
129.07	71.	37.61	1.11	2.110E-02				
185.90	125.	23.23	1.14	1.859E-02				
185.90	125.	23.23	1.14	1.859E-02	185.99	3.280	1.884E+00	RA226
208.59	74.	35.72	0.78	1.726E-02				
238.67	559.	5.11	1.12	1.558E-02				
238.67	559.	5.11	1.12	1.558E-02	238.63	43.100	7.660E-01	PB212
241.81	91.	22.20	1.12	1.541E-02	241.00	3.900	1.388E+00	RA224
295.29	151.	12.69	1.24	1.292E-02	295.22	19.200	5.588E-01	PB214
338.83	142.	16.43	1.06	1.134E-02	338.40	12.010	9.583E-01	AC228
351.99	233.	8.63	1.18	1.092E-02	351.99	37.100	5.288E-01	PB214
462.52	60.	27.67	0.85	8.359E-03				
462.52	60.	27.67	0.85	8.359E-03	463.51	10.000	6.638E-01	SB125
511.23	81.	18.58	1.52	7.583E-03	510.72	22.500	4.363E-01	TL208
583.29	191.	10.28	1.22	6.683E-03	583.14	86.000	3.063E-01	TL208
609.44	162.	12.40	0.97	6.411E-03	609.32	46.090	5.055E-01	BI214
661.62	359.	6.03	1.26	5.937E-03	661.62	84.620	6.576E-01	CS137
727.52	35.	28.71	1.20	5.441E-03	727.17	11.800	5.013E-01	BI212
794.75	34.	32.34	1.45	5.022E-03				
911.25	111.	12.77	1.88	4.446E-03	911.07	29.000	7.947E-01	AC228

967.67	71.	16.12	1.11	4.217E-03	968.90	17.460	8.881E-01	AC228
1120.86	38.	25.15	1.16	3.711E-03	1120.28	15.040	6.296E-01	BI214
1460.81	387.	5.17	2.13	2.942E-03	1460.75	10.700	1.130E+01	K40
1764.24	27.	19.25	1.75	2.481E-03	1764.51	15.920	6.288E-01	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
149.57	75.20	279.	162.	0.081	49.78	1.005	PB-214	D
153.56	77.19	259.	308.	0.154	28.00	1.006	PB-214	D
416.85	208.59	262.	74.	0.037	107.16	0.784	LU-177	
477.05	238.51	129.	559.	0.279	15.34	1.122	PB-212	D
483.31	241.65	158.	91.	0.045	66.61	1.124	PB-214	D
1589.73	794.75	27.	33.	0.017	84.45	1.446	AC-228	

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-212	149.06	74.75	734.	163.	0.082	74.30	1.499
PB-214	153.79	77.11	654.	235.	0.118	50.10	1.499D
PB-212	153.79	77.11	654.	235.	0.118	50.10	1.499D
TH-234	185.56	92.99	624.	111.	0.056	99.50	1.499s
TH-234	185.54	92.98	597.	113.	0.057	95.92	1.499s
RA-226	371.85	186.10	282.	111.	0.055	70.22	1.499s
PB-212	476.92	238.61	299.	418.	0.209	22.88	1.499
RA-224	483.20	241.75	380.	86.	0.043	101.36	1.499s
PB-214	590.34	295.30	159.	149.	0.074	43.52	1.499
AC-228	677.44	338.83	134.	142.	0.071	49.28	1.057s
PB-214	703.78	351.99	89.	232.	0.116	26.22	1.499D
SB-125	926.04	463.07	78.	39.	0.020	106.36	1.499
TL-208	1022.40	511.23	56.	81.	0.041	55.75	1.524s
TL-208	1166.58	583.29	58.	191.	0.096	30.84	1.218s
BI-214	1218.91	609.44	74.	162.	0.081	37.19	0.966
CS-137	1323.33	661.62	38.	359.	0.179	18.10	1.263
BI-212	1455.19	727.52	30.	35.	0.018	86.14	1.197
AC-228	1822.86	911.25	28.	111.	0.056	38.32	1.878
AC-228	1935.76	967.67	20.	71.	0.036	48.36	1.115s
BI-214	2242.32	1120.86	21.	38.	0.019	75.44	1.163s
K-40	2922.64	1460.81	3.	387.	0.193	15.52	2.129
BI-214	3529.92	1764.24	0.	27.	0.014	57.74	1.749

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Code	MDA Value pCi/gm		COMMENTS
BE-7		2.3545E-02						
			477.56	2.354E-02	&(	5.595E-01	1.61E-01	G
K-40		1.1302E+01						
			1460.75	1.130E+01	(	3.227E-01	5.85E-01	G
MN-54		0.0000E+00						
			834.81	0.000E+00	&(	7.368E-02	2.08E-02	G
CO-57		1.7685E-02						
			122.07	1.769E-02	&(P	5.294E-02	1.59E-02	G K
			136.43	1.602E-01	&	4.085E-01	1.23E-01	G
CO-60		3.9014E-03						
			1332.51	3.901E-03	%(P	7.066E-02	1.79E-02	G K
			1173.23	2.774E-02	% P	8.718E-02	2.48E-02	G K
Sr-85		-1.9536E-02						
			514.00	-1.954E-02	%(	6.706E-02	1.99E-02	G
Kr-85		-4.1760E+02						
			513.99	-4.176E+02	%(	1.434E+03	4.26E+02	G
Y-88		-7.1348E-03						
			1836.01	-7.135E-03	%(P	6.224E-02	1.61E-02	G K
			898.02	1.750E-02	& P	5.200E-02	1.51E-02	G
NB-94		0.0000E+00						
			871.10	0.000E+00	%(	5.621E-02	1.54E-02	G K
			702.50	-1.101E-02	&	5.891E-02	1.71E-02	G K
Ag-108M		-8.0394E-04						
			722.95	-8.039E-04	%(	5.190E-02	1.43E-02	G K
			614.37	-9.237E-03	%	6.534E-02	1.89E-02	G
			433.93	9.154E-03	%	4.978E-02	1.45E-02	G
CD-109		-5.4332E-01						
			88.04	-5.433E-01	&(	1.785E+00	5.38E-01	G
SN-113		-1.8257E-03						
			391.71	-1.826E-03	%(P	8.806E-02	2.54E-02	G K
			255.04	-1.324E-01	&	2.125E+00	6.22E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	1.1293E-01						
		427.95	3.686E-03	&(	1.752E-01	5.04E-02	G K
		600.77	-2.521E-03	%	2.402E-01	6.67E-02	G
		636.15	1.318E-01	%	3.374E-01	1.01E-01	G
		463.51	4.363E-01	(	4.853E-01	1.55E-01	G
		176.29	9.731E-02	&	6.902E-01	2.05E-01	G
I-131	5.0313E-02						
		364.48	5.031E-02	&(	8.102E-02	2.50E-02	G K
		636.97	-8.567E-02	&	1.247E+00	3.52E-01	G
		284.29	8.146E-02	%	1.189E+00	3.46E-01	G
CS-134	-1.9756E-02						
		604.66	-1.976E-02	&(	6.854E-02	2.03E-02	G K
		795.76	2.196E-03	%	4.263E-02	1.14E-02	G
		569.29	0.000E+00	%	3.251E-01	9.14E-02	G
		801.84	2.484E-02	%	3.973E-01	1.06E-01	G
CS-137	6.5760E-01						
		661.62	6.576E-01	(	5.758E-02	3.97E-02	G
CE-139	-9.0639E-03						
		165.85	-9.064E-03	&(P	5.449E-02	1.62E-02	G
EU-152	-5.0657E-02						
		121.78	-5.066E-02	&(	1.598E-01	4.81E-02	G K
		344.30	-6.225E-02	&	1.828E-01	5.47E-02	G
		1408.08	4.124E-02	&	2.310E-01	6.32E-02	G
		964.00	3.125E-03	&	6.346E-01	1.80E-01	G
		1112.07	1.184E-01	%	4.617E-01	1.33E-01	G
		778.90	-1.272E-03	&	4.175E-01	1.15E-01	G
EU-154	3.6169E-02						
		123.10	3.617E-02	%(	1.132E-01	3.40E-02	G K
		1274.80	0.000E+00	&	2.443E-01	6.77E-02	G
		723.30	4.302E-03	%	2.910E-01	8.15E-02	G
		1004.80	-4.314E-02	%	3.771E-01	1.07E-01	G
EU-155	8.6492E-02						
		86.45	8.649E-02	%(	1.914E-01	5.80E-02	G K
		105.31	-5.189E-04	%	2.070E-01	6.12E-02	G
HG-203	-4.9460E-03						
		279.17	-4.946E-03	%(P	6.321E-02	1.82E-02	G K
		72.87	-5.822E-01	&	1.453E+00	4.39E-01	G
		70.83	-7.723E-01	%	2.614E+00	7.87E-01	G
		82.50	-1.121E+00	&	3.140E+00	9.47E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	3.0628E-01						
		583.14	3.063E-01	@(	6.093E-02	3.15E-02	G
		510.72	4.363E-01	+	2.024E-01	8.12E-02	G
PB-212	5.7300E-01						
		238.63	5.730E-01	(	1.142E-01	4.37E-02	G K
							Energy duplication
		77.11	7.187E-01	+	3.724E-01	1.20E-01	G
		74.81	9.445E-01	&	7.470E-01	2.34E-01	G
PB-214	5.3509E-01						
							Energy duplication
		351.99	5.262E-01	(	1.061E-01	4.60E-02	G K
		295.22	5.523E-01	(	2.279E-01	8.01E-02	G
							Energy duplication
		77.11	1.175E+00	+	6.091E-01	1.96E-01	G
		241.92	-2.111E-01	%	7.939E-01	2.38E-01	G
BI-212	5.0130E-01						
		727.17	5.013E-01	(	4.044E-01	1.44E-01	G K
		1620.56	1.637E-01	&	2.194E+00	5.81E-01	G
		785.42	1.617E+00	%	2.299E+00	7.31E-01	G
BI-214	5.5517E-01						
		609.32	5.055E-01	(	1.329E-01	6.27E-02	G K
		1764.51	6.288E-01	(	1.716E-01	1.21E-01	G
		1120.28	6.296E-01	(	3.950E-01	1.58E-01	G
RA-224	1.3150E+00						
		241.00	1.315E+00	(	1.429E+00	4.44E-01	G
RA-226	1.6745E+00						
		185.99	1.675E+00	@(	1.221E+00	3.92E-01	G
AC-228	8.5621E-01						
		911.07	7.947E-01	(	1.940E-01	1.02E-01	G K
		968.90	8.881E-01	@(	2.946E-01	1.43E-01	G
		338.40	9.583E-01	@(	3.823E-01	1.58E-01	G
TH-227	-2.7692E-01						
		236.00	-2.769E-01	%(	5.471E-01	1.66E-01	G K
		256.25	3.208E-02	%	5.732E-01	1.67E-01	G
PA-234	5.9680E-02						
		98.44	5.968E-02	%(	1.883E-01	5.66E-02	G K
		946.00	-1.915E-02	&	3.333E-01	9.34E-02	G
		131.28	-7.602E-02	%	2.368E-01	7.12E-02	G
		94.67	-1.092E-01	&	3.714E-01	1.12E-01	G
		883.24	1.187E-01	%	4.609E-01	1.34E-01	G
		926.70	-8.716E-03	&	4.656E-01	1.26E-01	G

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 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26 0.000E+00 %   4.791E-01 1.35E-01 G

TH-234       1.2922E+00
                           63.29 4.753E-01 &(  2.296E+00 6.87E-01 G K
                           92.80 1.743E+00  (  1.797E+00 5.57E-01 G
                           92.38 2.005E+00  (  2.149E+00 6.65E-01 G

AM-241      -5.0323E-02
                           59.54-5.032E-02 &(P 3.259E-01 9.72E-02 G
   ( - This peak used in the nuclide activity average.

   * - Peak is too wide, but only one peak in library.
   ! - Peak is part of a multiplet and this area went
       negative during deconvolution.
   ? - Peak is too narrow.
   @ - Peak is too wide at FW25M, but ok at FWHM.
   % - Peak fails sensitivity test.
   $ - Peak identified, but first peak of this nuclide
       failed one or more qualification tests.
   + - Peak activity higher than counting uncertainty range.
   - - Peak activity lower than counting uncertainty range.
   = - Peak outside analysis energy range.
   & - Calculated peak centroid is not close enough to the
       library energy centroid for positive identification.
   P - Peakbackground subtraction
   } - Peak is too close to another for the activity
       to be found directly.

   Nuclide Codes:                      Peak Codes:
   T - Thermal Neutron Activation      G - Gamma Ray
   F - Fast Neutron Activation         X - X-Ray
   I - Fission Product                 P - Positron Decay
   N - Naturally Occurring Isotope     S - Single-Escape
   P - Photon Reaction                 D - Double-Escape
   C - Charged Particle Reaction       K - Key Line
   M - No MDA Calculation              A - Not in Average
   R - Coincidence Corrected           C - Coincidence Peak
   H - Halflife limit exceeded

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
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***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	2.1446E-02	2.3545E-02	4.8221E-01	4.8221E-01	5.096E-01
K-40		1.1302E+01	1.1302E+01	1.7536E+00	1.8663E+00	
MN-54	#A	0.0000E+00	0.0000E+00	6.2280E-02	6.2280E-02	7.251E-02
CO-57	#B	1.7362E-02	1.7685E-02	4.7761E-02	4.7771E-02	5.198E-02
CO-60	#B	3.8913E-03	3.9014E-03	5.3724E-02	5.3724E-02	7.048E-02

Sr-85	#A	-1.8091E-02	-1.9536E-02	5.9763E-02	5.9773E-02	6.210E-02
Kr-85	#A	-4.1757E+02	-4.1760E+02	1.2776E+03	1.2779E+03	1.434E+03
Y-88	#B	-6.8089E-03	-7.1348E-03	6.3989E-02	6.3990E-02	5.940E-02
NB-94	#B	0.0000E+00	0.0000E+00	4.6274E-02	4.6274E-02	5.621E-02
Ag-108M	#B	-8.0386E-04	-8.0394E-04	4.2825E-02	4.2825E-02	5.189E-02
CD-109	#A	-5.3738E-01	-5.4332E-01	1.6131E+00	1.6134E+00	1.765E+00
SN-113	#B	-1.7483E-03	-1.8257E-03	1.8263E-01	1.8263E-01	8.433E-02
SB-125	#B	1.1237E-01	1.1293E-01	1.2011E-01	1.2028E-01	1.743E-01
I-131	#B	2.7066E-02	5.0313E-02	7.5115E-02	7.5169E-02	4.358E-02
CS-134	#B	-1.9625E-02	-1.9756E-02	6.0956E-02	6.0967E-02	6.809E-02
CS-137		6.5731E-01	6.5760E-01	1.1903E-01	1.2470E-01	
CE-139	#A	-8.7412E-03	-9.0639E-03	4.9533E-02	4.9536E-02	5.255E-02
EU-152	#B	-5.0602E-02	-5.0657E-02	1.4415E-01	1.4418E-01	1.596E-01
EU-154	#B	3.6111E-02	3.6169E-02	1.0214E-01	1.0216E-01	1.130E-01
EU-155	#B	8.6254E-02	8.6492E-02	1.7391E-01	1.7398E-01	1.908E-01
HG-203	#B	-4.4442E-03	-4.9460E-03	2.2389E+00	2.2389E+00	5.680E-02
TL-208	#	3.0628E-01	3.0628E-01	9.4470E-02	9.6042E-02	
PB-212	#	5.7300E-01	5.7300E-01	1.3111E-01	1.3505E-01	1.142E-01
PB-214	#	5.3509E-01	5.3509E-01	1.3593E-01	1.3925E-01	1.061E-01
BI-212		5.0130E-01	5.0130E-01	4.3183E-01	4.3276E-01	
BI-214		5.5517E-01	5.5517E-01	1.8879E-01	1.9138E-01	
RA-224	#A	1.3150E+00	1.3150E+00	1.3329E+00	1.3349E+00	1.429E+00
RA-226	#	1.6745E+00	1.6745E+00	1.1759E+00	1.1797E+00	1.221E+00
AC-228		8.5621E-01	8.5621E-01	2.2537E-01	2.3050E-01	
TH-227	#B	-2.7692E-01	-2.7692E-01	4.9849E-01	4.9874E-01	5.471E-01
PA-234	#B	5.9680E-02	5.9680E-02	1.6988E-01	1.6991E-01	1.883E-01
TH-234	#B	1.2922E+00	1.2922E+00	1.2395E+00	1.2416E+00	2.296E+00
AM-241	#A	-5.0322E-02	-5.0323E-02	3.0064E-01	3.0065E-01	3.259E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (270.1 to 1999.1 keV) 1.4177830E+01 pCi/gm
Total Decayed Activity (270.1 to 1999.1 keV) 1.4178127E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
VSB

Reviewed by: _____
Supervisor

Laboratory: Yankee Chemistry

Yankee Chemistry Spectrum name: 101F_17NOV2004_2050.An1

Sample description
Detector 101 FSS-OOL-05-01-018-B SOIL

Spectrum Filename: C:\My Documents\FSS_ReanalysisArea\101F_17NOV2004_2050.An1

Acquisition information
Start time: 17-Nov-2004 20:42:30
Live time: 2000
Real time: 2002
Dead time: 0.11 %
Detector ID: 1

Detector system
Det 101- DSPE-633

Calibration
Filename: D1_1LSa.Clb
Detector 101 1.0 Liter Marinelli Sand

Energy Calibration
Created: 03-Sep-2004 08:50:48
Zero offset: 0.244 keV
Gain: 0.500 keV/channel
Quadratic: -2.493E-08 keV/channel^2

Efficiency Calibration
Created: 03-Sep-2004 08:52:26
Type: Polynomial
Uncertainty: 0.626 %
Coefficients: -0.321775 -5.816463 0.734234
-0.099357 0.006049 -0.000149

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.23keV)
Stop channel: 4000 (1999.11keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 1.4580E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.4580E+03) =
6.8587E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00

```
Systematic error:           1.0000000E+00
Fraction Limit:             0.000%
```

Yankee Chemistry Spectrum name: 101F_17NOV2004_2050.An1

Background width: average of five points.
Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	10-Nov-2004 14:31:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	1010K_Background_Det101.Pbc 17-May-2004 16:32:19
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 15 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.0969

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
63.29	86.	38.50	1.37	1.119E-02				
63.29	86.	38.50	1.37	1.119E-02	63.29	3.900	1.824E+00	TH234
74.71	211.	13.99	1.00	1.651E-02				
74.71	211.	13.99	1.00	1.651E-02	74.81	9.600	1.231E+00	PB212
74.85	210.	19.95	1.50	1.654E-02				
74.85	210.	19.95	1.50	1.654E-02	74.81	9.600	1.224E+00	PB212
77.00	254.	16.14	1.50	1.720E-02	77.11	17.500	7.822E-01	PB212
					77.11	10.700	1.279E+00	PB214
77.11	300.	10.18	1.01	1.720E-02	77.11	17.500	9.235E-01	PB212
					77.11	10.700	1.510E+00	PB214
84.10	60.	36.44	1.09	1.872E-02				
93.08	91.	41.32	1.50	1.989E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	1.418E+00	TH234
93.09	93.	40.99	1.50	1.985E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	1.448E+00	TH234
186.01	151.	20.53	1.57	1.858E-02	185.99	3.280	2.296E+00	RA226
209.52	58.	36.17	1.43	1.720E-02				
238.72	610.	4.77	1.12	1.557E-02	238.63	43.100	8.425E-01	PB212
241.79	94.	22.17	1.12	1.541E-02	241.00	3.900	1.439E+00	RA224
					241.92	7.470	7.539E-01	PB214
269.97	121.	21.97	1.68	1.402E-02				
295.22	165.	15.11	1.14	1.292E-02	295.22	19.200	6.154E-01	PB214
300.60	57.	32.03	1.31	1.270E-02				
328.19	77.	29.55	1.62	1.169E-02				
338.51	120.	18.66	1.22	1.135E-02	338.40	12.010	8.173E-01	AC228
351.84	282.	9.40	1.12	1.093E-02	351.99	37.100	6.460E-01	PB214

409.89	37.	38.24	0.73	9.411E-03				
463.24	35.	38.99	1.50	8.342E-03	463.51	10.000	PBC<MDA	SB125
511.32	108.	15.71	1.22	7.582E-03	510.72	22.500	5.861E-01	TL208
583.11	166.	12.12	1.26	6.685E-03	583.14	86.000	2.680E-01	TL208
609.38	200.	8.84	1.29	6.412E-03	609.32	46.090	6.266E-01	BI214
661.69	225.	8.72	1.41	5.937E-03	661.62	84.620	4.151E-01	CS137
726.97	33.	35.96	1.47	5.443E-03	727.17	11.800	4.820E-01	BI212
861.74	39.	28.56	0.90	4.671E-03				
911.22	102.	12.58	1.29	4.446E-03	911.07	29.000	7.367E-01	AC228

Yankee Chemistry Spectrum name: 101F_17NOV2004_2050.An1

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
968.11	112.	14.89	1.74	4.215E-03	968.90	17.460	1.406E+00	AC228
1119.92	55.	29.25	1.28	3.712E-03	1120.28	15.040	9.101E-01	BI214
1460.63	553.	4.34	2.10	2.943E-03	1460.75	10.700	1.629E+01	K40
1764.07	33.	17.41	1.17	2.481E-03	1764.51	15.920	7.743E-01	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
126.13	63.29	438.	86.	0.043	115.49	1.368	PA-234	l
148.99	74.72	330.	211.	0.105	41.97	1.005	BI-207	D
418.72	209.52	191.	58.	0.029	108.50	1.432	AC-228	s
477.14	238.70	119.	610.	0.305	14.31	1.122	PB-212	D
539.67	269.97	189.	121.	0.060	55.38	1.677	AC-228	s
600.94	300.60	113.	57.	0.028	96.10	1.310	PB-212	s
656.15	328.19	152.	77.	0.038	88.66	1.620	AC-228	s
819.63	409.89	67.	37.	0.018	114.73	0.733	AC-228	s
1723.77	861.74	25.	39.	0.019	73.25	0.904	TL-208	s

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
HG-203	145.79	73.11	840.	-103.	-0.052	122.97	1.499
PB-212	149.27	74.85	771.	210.	0.105	59.86	1.499s
PB-212	153.79	77.11	714.	254.	0.127	48.41	1.499D
PB-214	153.79	77.11	316.	300.	0.150	30.53	1.006D
TH-234	185.77	93.09	684.	93.	0.047	122.96	1.499s
TH-234	185.73	93.08	666.	91.	0.046	123.96	1.499s
RA-226	371.88	186.11	369.	127.	0.064	69.36	1.499s
PB-212	477.11	238.71	313.	483.	0.242	20.67	1.499
RA-224	483.63	241.97	366.	85.	0.042	101.07	1.499
PB-214	483.54	241.92	124.	95.	0.047	58.60	1.124D
PB-214	590.18	295.22	168.	165.	0.082	45.32	1.135
AC-228	676.80	338.51	137.	120.	0.060	55.99	1.222
PB-214	703.47	351.84	136.	282.	0.141	28.21	1.120s
SB-125	926.38	463.24	76.	35.	0.018	116.98	1.499s
TL-208	1022.58	511.32	60.	108.	0.054	47.14	1.217s
TL-208	1166.23	583.11	75.	166.	0.083	36.35	1.257

Yankee Chemistry Spectrum name: 101F_17NOV2004_2050.An1

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
BI-214	1218.80	609.38	43.	200.	0.100	26.53	1.288
CS-137	1323.48	661.69	55.	225.	0.112	26.16	1.413
BI-212	1454.09	726.97	40.	33.	0.017	107.89	1.466
AC-228	1822.80	911.22	26.	102.	0.051	37.74	1.292
AC-228	1936.64	968.11	37.	112.	0.056	44.67	1.742s
BI-214	2240.43	1119.92	53.	55.	0.027	87.76	1.278
K-40	2922.27	1460.63	6.	553.	0.277	13.01	2.100s
BI-214	3529.58	1764.07	0.	33.	0.016	52.22	1.166s

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Code	MDA Value pCi/gm		COMMENTS
BE-7		1.2326E-01						
			477.56	1.233E-01	%(	4.955E-01	1.46E-01	G
K-40		1.6285E+01						
			1460.75	1.629E+01	@(	4.102E-01	7.06E-01	G
MN-54		3.3746E-04						
			834.81	3.375E-04	%(	6.691E-02	1.87E-02	G
CO-57		9.5337E-04						
			122.07	9.534E-04	%(P	5.757E-02	1.70E-02	G K
			136.43	3.571E-02	%	4.618E-01	1.37E-01	G
CO-60		-1.8205E-02						
			1332.51	-1.821E-02	%(P	7.446E-02	1.73E-02	G K
			1173.23	-2.078E-02	& P	8.012E-02	2.01E-02	G K
Sr-85		-1.0518E-02						
			514.00	-1.052E-02	&(	5.916E-02	1.73E-02	G
Kr-85		-2.2285E+02						
			513.99	-2.228E+02	&(	1.263E+03	3.69E+02	G
Y-88		1.4589E-03						
			1836.01	1.459E-03	%(P	4.619E-02	1.07E-02	G K
			898.02	8.648E-03	% P	5.769E-02	1.61E-02	G
NB-94		0.0000E+00						
			871.10	0.000E+00	%(	7.029E-02	1.97E-02	G K
			702.50	-9.706E-03	&	6.061E-02	1.75E-02	G K

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
Ag-108M	1.5471E-03						
		722.95	1.547E-03	%(	6.594E-02	1.86E-02	G K
		614.37	-1.462E-02	%	6.358E-02	1.86E-02	G
		433.93	-6.403E-03	%	4.732E-02	1.37E-02	G
CD-109	-3.1970E-02						
		88.04	-3.197E-02	%(	1.759E+00	5.24E-01	G
SN-113	2.4017E-02						
		391.71	2.402E-02	%(P	8.048E-02	2.39E-02	G K
		255.04	-4.419E-01	&	2.405E+00	7.14E-01	G
SB-125	7.4872E-02						
		427.95	-3.216E-02	%(	1.699E-01	4.98E-02	G K
		600.77	-3.866E-02	%	3.064E-01	8.83E-02	G
		636.15	-8.929E-02	%	4.447E-01	1.29E-01	G
		463.51	3.917E-01	*(	4.839E-01	1.53E-01	G
		176.29	-1.462E-01	&	7.699E-01	2.30E-01	G
I-131	-2.1075E-02						
		364.48	-2.107E-02	%(	9.392E-02	2.76E-02	G K
		636.97	-2.494E-01	%	1.234E+00	3.56E-01	G
		284.29	-2.651E-01	%	1.445E+00	4.28E-01	G
CS-134	1.0456E-03						
		604.66	1.046E-03	&(	4.767E-02	1.33E-02	G K
		795.76	2.998E-03	%	6.082E-02	1.69E-02	G
		569.29	-4.628E-03	&	2.862E-01	7.98E-02	G
		801.84	-6.530E-02	%	6.198E-01	1.75E-01	G
CS-137	4.1507E-01						
		661.62	4.151E-01	(	6.884E-02	3.62E-02	G
CE-139	9.4162E-03						
		165.85	9.416E-03	&(P	6.106E-02	1.82E-02	G
EU-152	-3.1942E-03						
		121.78	-3.194E-03	%(	1.775E-01	5.27E-02	G K
		344.30	-3.537E-02	%	1.891E-01	5.58E-02	G
		1408.08	5.503E-02	%	2.638E-01	7.38E-02	G
		964.00	9.691E-03	%	6.651E-01	1.90E-01	G
		1112.07	-7.007E-02	&	4.851E-01	1.37E-01	G
		778.90	8.484E-02	%	3.899E-01	1.12E-01	G
EU-154	-4.9744E-03						
		123.10	-4.974E-03	%(	1.190E-01	3.53E-02	G K
		1274.80	1.182E-02	%	1.964E-01	5.40E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
		723.30	9.171E-03	&	4.369E-01	1.26E-01	G
		1004.80	1.346E-01	%	3.284E-01	9.83E-02	G
EU-155	-2.6415E-02						
		86.45	-2.642E-02	%(	1.798E-01	5.37E-02	G K
		105.31	3.281E-02	%	2.295E-01	6.85E-02	G
HG-203	9.0610E-03						
		279.17	9.061E-03	%(P	6.108E-02	1.79E-02	G K
		72.87	-9.642E-01	%	1.617E+00	4.92E-01	G
		70.83	-1.999E+00	&	2.673E+00	8.19E-01	G
		82.50	-7.799E-01	%	3.214E+00	9.65E-01	G
TL-208	2.6796E-01						
		583.14	2.680E-01	(	6.935E-02	3.25E-02	G
		510.72	5.861E-01	+	2.106E-01	9.22E-02	G
PB-212	7.0061E-01						
		238.63	6.675E-01	(	1.175E-01	4.60E-02	G K
							Energy duplication
		77.11	7.822E-01	@(	3.915E-01	1.26E-01	G
		74.81	1.224E+00	&	7.711E-01	2.44E-01	G
PB-214	6.5062E-01						
		351.99	6.460E-01	@(	1.307E-01	6.07E-02	G K
		295.22	6.154E-01	(	2.360E-01	9.30E-02	G
							Energy duplication
		77.11	1.510E+00	+	4.308E-01	1.54E-01	G
		241.92	7.640E-01	(	4.402E-01	1.49E-01	G
BI-212	4.8199E-01						
		727.17	4.820E-01	(	4.623E-01	1.73E-01	G K
		1620.56	-1.085E-01	%	2.241E+00	5.88E-01	G
		785.42	8.061E-01	%	2.635E+00	7.74E-01	G
BI-214	6.6448E-01						
		609.32	6.266E-01	(	1.045E-01	5.54E-02	G K
		1764.51	7.743E-01	(	1.729E-01	1.35E-01	G
		1120.28	9.101E-01	+	6.095E-01	2.66E-01	G
RA-224	1.3047E+00						
		241.00	1.305E+00	(	1.413E+00	4.40E-01	G
RA-226	1.9340E+00						
		185.99	1.934E+00	*(	1.402E+00	4.47E-01	G
AC-228	7.6034E-01						
		911.07	7.367E-01	(	1.886E-01	9.27E-02	G K
		968.90	1.406E+00	+	3.933E-01	2.09E-01	G
		338.40	8.173E-01	(	3.890E-01	1.53E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TH-227	-8.1762E-02						
		236.00	-8.176E-02	%(	5.211E-01	1.55E-01	G K
		256.25	1.778E-01	&	6.399E-01	1.91E-01	G
PA-234	-4.2116E-02						
		98.44	-4.212E-02	&(	2.039E-01	6.10E-02	G K
		946.00	1.848E-02	%	2.620E-01	7.20E-02	G
		131.28	1.963E-02	&	2.487E-01	7.40E-02	G
		94.67	-1.095E-03	%	3.610E-01	1.07E-01	G
		883.24	-2.045E-02	%	4.197E-01	1.15E-01	G
		926.70	-3.255E-02	%	5.121E-01	1.42E-01	G
		569.26	1.137E-02	&	4.120E-01	1.15E-01	G
TH-234	1.6067E+00						
							Energy duplication
		63.29	1.694E+00	%(	2.442E+00	7.48E-01	G K
		92.80	1.418E+00	*(	1.909E+00	5.86E-01	G
		92.38	1.694E+00	&(	2.263E+00	6.95E-01	G
AM-241	-1.3642E-01						
		59.54	-1.364E-01	%(P	3.709E-01	1.12E-01	G

(- This peak used in the nuclide activity average.

* - Peak is too wide, but only one peak in library.
! - Peak is part of a multiplet and this area went negative during deconvolution.
? - Peak is too narrow.
@ - Peak is too wide at FW25M, but ok at FWHM.
% - Peak fails sensitivity test.
$ - Peak identified, but first peak of this nuclide failed one or more qualification tests.
+ - Peak activity higher than counting uncertainty range.
- - Peak activity lower than counting uncertainty range.
= - Peak outside analysis energy range.
& - Calculated peak centroid is not close enough to the library energy centroid for positive identification.
P - Peakbackground subtraction
} - Peak is too close to another for the activity to be found directly.

Nuclide Codes:	Peak Codes:
T - Thermal Neutron Activation	G - Gamma Ray
F - Fast Neutron Activation	X - X-Ray
I - Fission Product	P - Positron Decay
N - Naturally Occurring Isotope	S - Single-Escape
P - Photon Reaction	D - Double-Escape
C - Charged Particle Reaction	K - Key Line
M - No MDA Calculation	A - Not in Average

R - Coincidence Corrected C - Coincidence Peak
H - Halflife limit exceeded

- -

***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	1.1218E-01	1.2326E-01	4.3681E-01	4.3687E-01	4.510E-01
K-40	#	1.6285E+01	1.6285E+01	2.1192E+00	2.3104E+00	
MN-54	#A	3.3207E-04	3.3746E-04	5.6133E-02	5.6133E-02	6.584E-02
CO-57	#B	9.3577E-04	9.5337E-04	5.1135E-02	5.1135E-02	5.650E-02
CO-60	#B	-1.8157E-02	-1.8205E-02	2.9414E+00	2.9414E+00	7.426E-02
Sr-85	#A	-9.7324E-03	-1.0518E-02	5.1802E-02	5.1805E-02	5.475E-02
Kr-85	#A	-2.2284E+02	-2.2285E+02	1.1060E+03	1.1061E+03	1.263E+03
Y-88	#B	1.3916E-03	1.4589E-03	3.2221E-02	3.2221E-02	4.406E-02
NB-94	#B	0.0000E+00	0.0000E+00	5.9053E-02	5.9053E-02	7.029E-02
Ag-108M	#B	1.5469E-03	1.5471E-03	5.5655E-02	5.5655E-02	6.594E-02
CD-109	#A	-3.1617E-02	-3.1970E-02	1.5706E+00	1.5706E+00	1.739E+00
SN-113	#B	2.2990E-02	2.4017E-02	7.1654E-02	7.1667E-02	7.703E-02
SB-125	#B	7.4500E-02	7.4872E-02	8.7588E-02	8.7690E-02	1.691E-01
I-131	#B	-1.1272E-02	-2.1075E-02	8.2868E-02	8.2876E-02	5.023E-02
CS-134	#B	1.0386E-03	1.0456E-03	3.9921E-02	3.9921E-02	4.735E-02
CS-137		4.1488E-01	4.1507E-01	1.0860E-01	1.1110E-01	
CE-139	#A	9.0779E-03	9.4162E-03	5.4555E-02	5.4557E-02	5.886E-02
EU-152	#B	-3.1907E-03	-3.1942E-03	1.5800E-01	1.5800E-01	1.773E-01
EU-154	#B	-4.9663E-03	-4.9744E-03	1.0594E-01	1.0594E-01	1.189E-01
EU-155	#B	-2.6342E-02	-2.6415E-02	1.6117E-01	1.6118E-01	1.793E-01
HG-203	#B	8.1336E-03	9.0610E-03	5.3651E-02	5.3654E-02	5.483E-02
TL-208		2.6796E-01	2.6796E-01	9.7408E-02	9.8578E-02	
PB-212	#	7.0061E-01	7.0061E-01	1.4480E-01	1.5011E-01	1.175E-01
PB-214		6.5062E-01	6.5062E-01	1.7192E-01	1.7581E-01	
BI-212		4.8199E-01	4.8199E-01	5.2002E-01	5.2073E-01	
BI-214		6.6448E-01	6.6448E-01	1.7627E-01	1.8022E-01	
RA-224	#A	1.3047E+00	1.3047E+00	1.3186E+00	1.3207E+00	1.413E+00
RA-226	#	1.9340E+00	1.9340E+00	1.3415E+00	1.3459E+00	1.402E+00
AC-228		7.6034E-01	7.6034E-01	2.5669E-01	2.6026E-01	
TH-227	#B	-8.1762E-02	-8.1762E-02	4.6566E-01	4.6568E-01	5.211E-01
PA-234	#B	-4.2116E-02	-4.2116E-02	1.8303E-01	1.8304E-01	2.039E-01
TH-234	#B	1.6067E+00	1.6067E+00	1.1737E+00	1.1771E+00	2.442E+00
AM-241	#A	-1.3642E-01	-1.3642E-01	3.3960E-01	3.3968E-01	3.709E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.

H - Halflife limit exceeded

Yankee Chemistry Spectrum name: 101F_17NOV2004_2050.An1

---------- S U M M A R Y ----------

Total Activity (269.6 to 1999.1 keV) 1.9525679E+01 pCi/gm
Total Decayed Activity (269.6 to 1999.1 keV) 1.9525867E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
VSB

Reviewed by: _____
Supervisor

Laboratory: Yankee Chemistry

Yankee Chemistry Spectrum name: 101F_30NOV2004_1905.An1

Sample description
Detector 101 FSS-OOL-05-01-007-F SOIL

Spectrum Filename: C:\My Documents\FSS_ReanalysisArea\101F_30NOV2004_1905.An1

Acquisition information
Start time: 30-Nov-2004 19:01:06
Live time: 2000
Real time: 2003
Dead time: 0.15 %
Detector ID: 1

Detector system
Det 101- DSPE-633

Calibration
Filename: D1_1LSa.Clb
Detector 101 1.0 Liter Marinelli Sand

Energy Calibration
Created: 03-Sep-2004 08:50:48
Zero offset: 0.244 keV
Gain: 0.500 keV/channel
Quadratic: -2.493E-08 keV/channel^2

Efficiency Calibration
Created: 03-Sep-2004 08:52:26
Type: Polynomial
Uncertainty: 0.626 %
Coefficients: -0.321775 -5.816463 0.734234
-0.099357 0.006049 -0.000149

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.23keV)
Stop channel: 4000 (1999.11keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 2.0030E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 2.0030E+03) = 4.9925E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00

```
Systematic error:           1.0000000E+00
Fraction Limit:             0.000%
```

Yankee Chemistry Spectrum name: 101F_30NOV2004_1905.An1

Background width: average of five points.
Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	10-Nov-2004 09:55:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	1010K_Background_Det101.Pbc 17-May-2004 16:32:19
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 12 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.1152

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
74.29	177.	19.16	1.00	1.637E-02				
74.29	177.	19.16	1.00	1.637E-02	74.81	9.600	7.504E-01	PB212
77.76	206.	17.59	1.01	1.738E-02	77.11	10.700	7.543E-01	PB214
					77.11	17.500	4.612E-01	PB212
87.62	115.	24.90	1.01	1.929E-02	86.45	32.740	1.256E-01	EU155
89.73	88.	30.82	1.02	1.957E-02	88.04	3.790	8.332E-01	CD109
93.07	113.	24.68	1.02	1.994E-02	92.38	2.570	1.496E+00	TH234
					92.80	3.000	1.278E+00	TH234
139.71	119.	25.97	1.40	2.085E-02				
186.56	127.	27.27	1.15	1.855E-02	185.99	3.280	1.404E+00	RA226
209.48	84.	38.51	1.42	1.720E-02				
238.68	728.	4.45	1.12	1.557E-02	238.63	43.100	7.316E-01	PB212
242.18	96.	23.09	1.12	1.539E-02	241.00	3.900	1.072E+00	RA224
					241.92	7.470	5.613E-01	PB214
270.27	79.	31.75	1.82	1.400E-02				
277.86	48.	38.07	0.90	1.366E-02				
277.86	48.	38.07	0.90	1.366E-02	279.17	81.500	PBC<MDA	HG203
295.25	184.	10.26	1.16	1.292E-02	295.22	19.200	5.012E-01	PB214
299.86	45.	32.74	1.16	1.273E-02				
338.25	152.	16.00	1.05	1.135E-02	338.40	12.010	7.498E-01	AC228
351.95	378.	7.81	1.32	1.093E-02				
351.95	378.	7.81	1.32	1.093E-02	351.99	37.100	6.299E-01	PB214
462.65	45.	41.29	1.19	8.357E-03				
462.65	45.	41.29	1.19	8.357E-03	463.51	10.000	3.674E-01	SB125
510.69	110.	18.99	1.54	7.591E-03	510.72	22.500	4.345E-01	TL208
583.23	186.	11.72	1.30	6.684E-03	583.14	86.000	2.181E-01	TL208

609.17	226.	9.04	1.38	6.414E-03	609.32	46.090	5.170E-01	BI214
					614.37	90.393	2.658E-01	Ag108M
725.99	78.	21.31	1.11	5.451E-03				
725.99	78.	21.31	1.11	5.451E-03	727.17	11.800	8.246E-01	BI212
910.91	155.	10.75	1.50	4.447E-03	911.07	29.000	8.110E-01	AC228
967.97	120.	14.73	1.75	4.216E-03	968.90	17.460	1.101E+00	AC228
1120.25	61.	29.33	2.01	3.711E-03	1120.28	15.040	7.326E-01	BI214
1238.27	45.	33.63	1.23	3.401E-03				
1460.50	581.	4.33	2.01	2.943E-03	1460.75	10.700	1.245E+01	K40

Yankee Chemistry Spectrum name: 101F_30NOV2004_1905.An1

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
1763.94	44.	17.27	1.13	2.481E-03	1764.51	15.920	7.480E-01	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
179.03	89.94	321.	88.	0.044	92.47	1.016	PB-214	lD
418.63	209.48	366.	84.	0.042	115.52	1.416	AC-228	s
540.27	270.27	213.	79.	0.040	95.26	1.824	AC-228	s
555.45	277.86	139.	48.	0.024	114.20	0.901	NP-239	l
599.49	299.87	139.	53.	0.026	109.50	1.024	TH-227	
925.20	462.65	106.	45.	0.022	123.87	1.194	CS-138	l
1452.12	725.99	94.	42.	0.021	107.06	1.111	J-132	s
2477.26	1238.27	55.	45.	0.022	100.88	1.229	CO-56	s

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-212	148.94	74.69	1109.	199.	0.100	73.97	1.499
PB-214	153.79	77.11	1054.	309.	0.154	47.75	1.499D
PB-212	153.79	77.11	1054.	309.	0.154	47.75	1.499D
EU-155	174.14	87.28	876.	110.	0.055	118.14	1.499s
TH-234	186.15	93.29	845.	111.	0.056	114.35	1.499s
TH-234	186.13	93.27	859.	117.	0.059	109.50	1.499s
RA-226	371.88	186.11	461.	104.	0.052	92.55	1.499s
PB-212	477.03	238.67	429.	576.	0.288	19.71	1.499
RA-224	483.17	241.74	523.	84.	0.042	120.36	1.499
PB-214	590.20	295.22	169.	182.	0.091	37.62	1.499
AC-228	676.28	338.25	162.	152.	0.076	48.00	1.050s
PB-214	703.65	351.93	160.	305.	0.153	24.59	1.499s
TL-208	1021.32	510.69	96.	110.	0.055	56.97	1.536s
TL-208	1166.47	583.23	90.	186.	0.093	35.17	1.304
BI-214	1218.38	609.17	66.	226.	0.113	27.12	1.379
BI-212	1454.02	726.93	52.	38.	0.019	94.12	1.499
AC-228	1822.16	910.91	36.	155.	0.078	32.24	1.498
AC-228	1936.35	967.97	55.	120.	0.060	44.19	1.749s
BI-214	2241.10	1120.25	59.	61.	0.030	88.00	2.013
K-40	2922.01	1460.50	14.	581.	0.290	13.00	2.011

Yankee Chemistry Spectrum name: 101F_30NOV2004_1905.An1

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
BI-214	3529.32	1763.94	3.	44.	0.022	51.82	1.128s

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	MDA Value pCi/gm	COMMENTS
BE-7		1.1754E-03					
			477.56	1.175E-03	%(	4.501E-01 1.28E-01	G
K-40		1.2450E+01					
			1460.75	1.245E+01	(	4.317E-01 5.40E-01	G
MN-54		2.2528E-02					
			834.81	2.253E-02	%(	4.982E-02 1.51E-02	G
CO-57		-9.8225E-04					
			122.07	-9.822E-04	&(P	4.363E-02 1.29E-02	G K
			136.43	-1.408E-01	%	4.086E-01 1.23E-01	G
CO-60		-4.3581E-03					
			1332.51	-4.358E-03	%(P	6.203E-02 1.59E-02	G K
			1173.23	7.726E-03	% P	6.665E-02 1.84E-02	G K
Sr-85		-2.9513E-02					
			514.00	-2.951E-02	%(	6.390E-02 1.93E-02	G
Kr-85		-5.4802E+02					
			513.99	-5.480E+02	%(	1.187E+03 3.59E+02	G
Y-88		3.2422E-03					
			1836.01	3.242E-03	&(P	4.987E-02 1.28E-02	G K
			898.02	-3.483E-03	& P	6.583E-02 1.84E-02	G
NB-94		8.9354E-03					
			871.10	8.935E-03	%(	3.692E-02 1.06E-02	G K
			702.50	1.479E-02	%	4.322E-02 1.28E-02	G K
Ag-108M		-1.6347E-02					
			722.95	-1.635E-02	&(	6.304E-02 1.86E-02	G K
			614.37	-3.062E-03	%	4.568E-02 1.30E-02	G
			433.93	1.236E-05	%	3.954E-02 1.13E-02	G

Yankee Chemistry Spectrum name: 101F_30NOV2004_1905.An1

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CD-109	5.3037E-01						
		88.04	5.304E-01	%(	1.321E+00	3.99E-01	G
SN-113	-1.2882E-03						
		391.71	-1.288E-03	%(P	6.395E-02	1.83E-02	G K
		255.04	1.973E-01	%	1.887E+00	5.57E-01	G
SB-125	0.0000E+00						
		427.95	0.000E+00	&(	1.414E-01	4.08E-02	G K
		600.77	0.000E+00	%	2.247E-01	6.35E-02	G
		636.15	0.000E+00	%	3.286E-01	9.16E-02	G
		463.51	2.513E-01	%	3.951E-01	1.22E-01	G
		176.29	-4.333E-02	&	6.345E-01	1.89E-01	G
I-131	-6.0457E-02						
		364.48	-6.046E-02	&(	2.495E-01	7.39E-02	G K
		636.97	1.376E+00	%	2.927E+00	8.87E-01	G
		284.29	-6.018E-01	%	3.526E+00	1.04E+00	G
CS-134	1.9522E-02						
		604.66	1.952E-02	&(	3.216E-02	9.99E-03	G K
		795.76	2.709E-02	%	4.550E-02	1.41E-02	G
		569.29	1.187E-02	&	2.399E-01	6.80E-02	G
		801.84	-2.113E-03	%	5.277E-01	1.47E-01	G
CS-137	-1.4536E-02						
		661.62	-1.454E-02	&(	6.182E-02	1.82E-02	G
CE-139	-1.0799E-02						
		165.85	-1.080E-02	%(P	4.793E-02	1.43E-02	G
EU-152	7.7809E-03						
		121.78	7.781E-03	&(	1.359E-01	4.04E-02	G K
		344.30	3.726E-03	&	1.384E-01	4.03E-02	G
		1408.08	6.468E-02	%	1.440E-01	4.37E-02	G
		964.00	1.209E-02	%	3.303E-01	9.19E-02	G
		1112.07	-5.862E-02	%	4.526E-01	1.29E-01	G
		778.90	1.008E-01	%	3.129E-01	9.23E-02	G
EU-154	4.0913E-03						
		123.10	4.091E-03	&(	9.347E-02	2.78E-02	G K
		1274.80	1.529E-02	%	1.248E-01	3.44E-02	G
		723.30	-1.162E-02	&	2.673E-01	7.64E-02	G
		1004.80	0.000E+00	&	2.664E-01	7.31E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
EU-155	1.1916E-01						
		86.45	1.192E-01	?(	1.530E-01	4.69E-02	G K
		105.31	3.657E-02	%	1.971E-01	5.90E-02	G
HG-203	2.6271E-02						
		279.17	2.627E-02	%(P	5.477E-02	1.65E-02	G K
		72.87	-6.122E-01	%	1.482E+00	4.49E-01	G
		70.83	9.363E-01	%	2.408E+00	7.28E-01	G
		82.50	-5.730E-01	%	3.135E+00	9.40E-01	G
TL-208	2.1806E-01						
		583.14	2.181E-01	(	5.512E-02	2.56E-02	G
		510.72	4.345E-01	+	1.911E-01	8.25E-02	G
PB-212	6.1181E-01						
		238.63	5.791E-01	(	9.972E-02	3.81E-02	G K
							Energy duplication
		77.11	6.923E-01	(	3.451E-01	1.10E-01	G
		74.81	8.472E-01	&	6.709E-01	2.09E-01	G
PB-214	5.0304E-01						
		351.99	5.077E-01	@(	1.027E-01	4.16E-02	G K
		295.22	4.940E-01	(	1.719E-01	6.19E-02	G
							Energy duplication
		77.11	1.132E+00	+	5.645E-01	1.80E-01	G
		241.92	3.134E-02	%	7.329E-01	2.18E-01	G
BI-212	3.9806E-01						
		727.17	3.981E-01	(	3.805E-01	1.25E-01	G K
		1620.56	3.023E-01	%	1.546E+00	4.28E-01	G
		785.42	8.539E-01	%	2.633E+00	7.82E-01	G
BI-214	5.1702E-01						
		609.32	5.170E-01	(	9.293E-02	4.67E-02	G K
		1764.51	7.480E-01	+	1.887E-01	1.29E-01	G
		1120.28	7.326E-01	+	4.669E-01	2.15E-01	G
RA-224	9.3835E-01						
		241.00	9.383E-01	(	1.224E+00	3.76E-01	G
RA-226	1.1493E+00						
		185.99	1.149E+00	@(	1.138E+00	3.55E-01	G
AC-228	7.9307E-01						
		911.07	8.110E-01	(	1.605E-01	8.71E-02	G K
		968.90	1.101E+00	+	3.419E-01	1.62E-01	G
		338.40	7.498E-01	@(	3.065E-01	1.20E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TH-227	0.0000E+00						
		236.00	0.000E+00	%(	4.026E-01	1.19E-01	G K
		256.25	7.667E-02	&	5.184E-01	1.53E-01	G
PA-234	-5.3446E-02						
		98.44	-5.345E-02	&(	1.521E-01	4.59E-02	G K
		946.00	1.121E-02	%	2.134E-01	5.91E-02	G
		131.28	8.345E-02	&	1.739E-01	5.27E-02	G
		94.67	-3.622E-02	%	2.613E-01	7.80E-02	G
		883.24	-1.256E-01	%	4.083E-01	1.20E-01	G
		926.70	4.062E-04	%	3.850E-01	1.05E-01	G
		569.26	1.449E-02	&	3.504E-01	9.92E-02	G
TH-234	1.0337E+00						
		63.29	5.188E-01	&(	2.148E+00	6.45E-01	G K
		92.80	1.327E+00	(	1.575E+00	4.84E-01	G
		92.38	1.473E+00	&(	1.827E+00	5.61E-01	G
AM-241	1.0241E-03						
		59.54	1.024E-03	%(P	2.912E-01	8.66E-02	G

(- This peak used in the nuclide activity average.

* - Peak is too wide, but only one peak in library.
! - Peak is part of a multiplet and this area went negative during deconvolution.
? - Peak is too narrow.
@ - Peak is too wide at FW25M, but ok at FWHM.
% - Peak fails sensitivity test.
$ - Peak identified, but first peak of this nuclide failed one or more qualification tests.
\+ - Peak activity higher than counting uncertainty range.
\- - Peak activity lower than counting uncertainty range.
= - Peak outside analysis energy range.
& - Calculated peak centroid is not close enough to the library energy centroid for positive identification.
P - Peakbackground subtraction
} - Peak is too close to another for the activity to be found directly.

Nuclide Codes:	Peak Codes:
T - Thermal Neutron Activation	G - Gamma Ray
F - Fast Neutron Activation	X - X-Ray
I - Fission Product	P - Positron Decay
N - Naturally Occurring Isotope	S - Single-Escape
P - Photon Reaction	D - Double-Escape
C - Charged Particle Reaction	K - Key Line
M - No MDA Calculation	A - Not in Average

R - Coincidence Corrected C - Coincidence Peak
H - Halflife limit exceeded

- -

***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	9.0221E-04	1.1754E-03	3.8391E-01	3.8391E-01	3.455E-01
K-40		1.2450E+01	1.2450E+01	1.6189E+00	1.7652E+00	
MN-54	#A	2.1532E-02	2.2528E-02	4.5159E-02	4.5177E-02	4.761E-02
CO-57	#B	-9.3218E-04	-9.8225E-04	1.2526E-01	1.2526E-01	4.140E-02
CO-60	#B	-4.3263E-03	-4.3581E-03	9.1771E-02	9.1771E-02	6.158E-02
Sr-85	#A	-2.3735E-02	-2.9513E-02	5.8036E-02	5.8060E-02	5.139E-02
Kr-85	#A	-5.4794E+02	-5.4802E+02	1.0777E+03	1.0781E+03	1.186E+03
Y-88	#B	2.8398E-03	3.2422E-03	3.8348E-02	3.8348E-02	4.368E-02
NB-94	#B	8.9354E-03	8.9354E-03	3.1907E-02	3.1911E-02	3.692E-02
Ag-108M	#B	-1.6342E-02	-1.6347E-02	5.5853E-02	5.5860E-02	6.302E-02
CD-109	#A	5.1409E-01	5.3037E-01	1.1985E+00	1.1988E+00	1.281E+00
SN-113	#B	-1.1394E-03	-1.2882E-03	9.3226E-01	9.3226E-01	5.656E-02
SB-125	#B	0.0000E+00	0.0000E+00	1.2237E-01	1.2237E-01	1.394E-01
I-131	#B	-1.0433E-02	-6.0457E-02	2.2159E-01	2.2161E-01	4.306E-02
CS-134	#B	1.9159E-02	1.9522E-02	2.9978E-02	2.9999E-02	3.156E-02
CS-137	#A	-1.4517E-02	-1.4536E-02	5.4602E-02	5.4609E-02	6.174E-02
CE-139	#A	-9.7442E-03	-1.0799E-02	4.3527E-02	4.3532E-02	4.325E-02
EU-152	#B	7.7572E-03	7.7809E-03	1.2131E-01	1.2131E-01	1.355E-01
EU-154	#B	4.0727E-03	4.0913E-03	8.3320E-02	8.3320E-02	9.305E-02
EU-155	#A	1.1824E-01	1.1916E-01	1.4079E-01	1.4094E-01	1.518E-01
HG-203	#B	1.9400E-02	2.6271E-02	4.9515E-02	4.9537E-02	4.045E-02
TL-208		2.1806E-01	2.1806E-01	7.6689E-02	7.7673E-02	
PB-212	#	6.1181E-01	6.1181E-01	1.2062E-01	1.2548E-01	9.972E-02
PB-214	#	5.0304E-01	5.0304E-01	1.1304E-01	1.1656E-01	1.027E-01
BI-212	#	3.9806E-01	3.9806E-01	3.7464E-01	3.7532E-01	3.805E-01
BI-214		5.1702E-01	5.1702E-01	1.4023E-01	1.4324E-01	
RA-224	#A	9.3835E-01	9.3835E-01	1.1294E+00	1.1307E+00	1.224E+00
RA-226	#	1.1493E+00	1.1493E+00	1.0637E+00	1.0657E+00	1.138E+00
AC-228		7.9307E-01	7.9307E-01	2.2927E-01	2.3361E-01	
TH-227	#B	0.0000E+00	0.0000E+00	3.5712E-01	3.5712E-01	4.026E-01
PA-234	#B	-5.3446E-02	-5.3446E-02	1.3755E-01	1.3758E-01	1.521E-01
TH-234	#B	1.0337E+00	1.0337E+00	1.1319E+00	1.1333E+00	2.148E+00
AM-241	#A	1.0241E-03	1.0241E-03	2.5976E-01	2.5976E-01	2.912E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.

H - Halflife limit exceeded

Yankee Chemistry Spectrum name: 101F_30NOV2004_1905.An1

---------- S U M M A R Y ----------

Total Activity (50.2 to 1999.1 keV) 1.3978134E+01 pCi/gm
Total Decayed Activity (50.2 to 1999.1 keV) 1.3978134E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
VSB

Reviewed by: _____
Supervisor

Laboratory: Yankee Chemistry

YAEC Chemistry Lab Spectrum name: 101F_7SEP2006_1417.An1

Sample description
FSS-OOL-05-03-005-F

Spectrum Filename: C:\GammaVision\Spectra\101F_7SEP2006_1417.An1

Acquisition information
Start time: 07-Sep-2006 14:17:18
Live time: 2000
Real time: 2001
Dead time: 0.07 %
Detector ID: 1

Detector system
Det 101- DSPE-633

Calibration
Filename: D1_1LSa.Clb
Detector 101 1.0 Liter Marinelli Sand

Energy Calibration
Created: 03-Sep-2004 08:50:48
Zero offset: 0.244 keV
Gain: 0.500 keV/channel
Quadratic: -2.493E-08 keV/channel^2

Efficiency Calibration
Created: 03-Sep-2004 08:52:26
Type: Polynomial
Uncertainty: 0.626 %
Coefficients: -0.321775 -5.816463 0.734234
-0.099357 0.006049 -0.000149

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.23keV)
Stop channel: 4000 (1999.11keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 1.6610E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.6610E+03) =
6.0205E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	01-Sep-2006 07:00:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	101_150K_28APR05.Pbc 01-May-2005 05:24:47
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 12 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.1519

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
74.93	150.	16.62	1.00	1.658E-02	74.81	9.600	7.430E-01	PB212
77.78	125.	22.02	1.01	1.738E-02	77.11	10.700	5.357E-01	PB214
					77.11	17.500	3.376E-01	PB212
89.79	75.	31.17	1.02	1.952E-02	88.04	3.790	PBC<MDA	CD109
93.09	98.	24.14	1.02	1.990E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
185.95	114.	26.31	1.13	1.859E-02				
185.95	114.	26.31	1.13	1.859E-02	185.99	3.280	1.527E+00	RA226
238.88	471.	5.50	1.12	1.557E-02	238.63	43.100	5.634E-01	PB212
241.93	72.	26.44	1.12	1.541E-02	241.00	3.900	PBC<MDA	RA224
269.66	54.	36.06	1.54	1.403E-02				
295.45	145.	11.45	1.16	1.291E-02	295.22	19.200	4.708E-01	PB214
300.14	35.	36.45	1.16	1.273E-02				
338.48	109.	19.22	1.48	1.135E-02	338.40	12.010	6.375E-01	AC228
352.04	228.	10.38	1.03	1.092E-02	351.99	37.100	4.535E-01	PB214
463.03	26.	40.51	1.50	8.342E-03	463.51	10.000	PBC<MDA	SB125
511.07	82.	17.43	0.97	7.585E-03	510.72	22.500	3.124E-01	TL208
583.42	144.	10.98	1.39	6.681E-03	583.14	86.000	2.003E-01	TL208
609.41	153.	11.72	1.43	6.412E-03	609.32	46.090	4.187E-01	BI214
727.57	39.	32.71	1.13	5.443E-03	727.17	11.800	4.905E-01	BI212
911.34	112.	14.62	1.36	4.445E-03	911.07	29.000	6.949E-01	AC228
968.72	68.	22.19	0.89	4.213E-03	968.90	17.460	7.443E-01	AC228
1120.42	20.	41.11	1.71	3.711E-03	1120.28	15.040	PBC<MDA	BI214
1461.13	474.	4.63	1.94	2.942E-03	1460.75	10.700	1.218E+01	K40
1764.50	18.	23.57	2.87	2.481E-03	1764.51	15.920	3.617E-01	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
149.43	74.93	237.	150.	0.075	49.86	1.005	PB-214	D
155.13	77.78	316.	125.	0.062	66.07	1.007	PB-214	D
179.17	89.54	237.	75.	0.038	93.51	1.016	PB-214	lD
477.47	238.77	100.	471.	0.236	16.50	1.122	PB-212	D
483.56	241.81	146.	72.	0.036	79.31	1.124	PB-214	D
539.04	269.66	128.	54.	0.027	108.19	1.537	AC-228	s
599.92	300.08	87.	39.	0.020	114.21	1.104	PB-212	

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-212	149.18	74.81	664.	126.	0.063	86.75	1.499
PB-214	153.79	77.11	601.	188.	0.094	58.28	1.499D
PB-212	153.79	77.11	597.	192.	0.096	58.28	1.499D
TH-234	185.78	93.10	587.	96.	0.048	99.71	1.499s
TH-234	185.74	93.08	569.	99.	0.049	100.48	1.499s
RA-226	372.09	186.22	299.	67.	0.034	114.80	1.499
PB-212	477.35	238.83	284.	396.	0.198	23.08	1.499
PB-214	590.46	295.35	110.	139.	0.069	40.40	1.499
AC-228	676.75	338.48	112.	107.	0.053	57.67	1.481s
PB-214	704.23	352.22	103.	180.	0.090	32.32	1.499
TL-208	1022.09	511.07	62.	66.	0.033	52.28	0.970s
TL-208	1166.84	583.42	41.	142.	0.071	32.93	1.392s
BI-214	1218.86	609.41	54.	152.	0.076	35.15	1.428
BI-212	1455.29	727.57	40.	39.	0.019	98.14	1.129
AC-228	1823.04	911.34	41.	110.	0.055	43.85	1.362s
AC-228	1937.83	968.71	43.	69.	0.035	66.12	0.898s
K-40	2923.28	1461.13	5.	471.	0.236	13.89	1.945
BI-214	3530.44	1764.50	0.	18.	0.009	70.71	2.873s

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	Peak MDA Value pCi/gm	COMMENTS
BE-7		1.4601E-01					
			477.56	1.460E-01	%(	4.388E-01 1.31E-01	G
K-40		1.2182E+01					
			1460.75	1.218E+01	(P	3.277E-01 5.67E-01	G
MN-54		-8.9646E-04					
			834.81	-8.965E-04	%(P	4.772E-02 1.30E-02	G
CO-57		-6.2014E-03					
			122.07	-6.201E-03	%(	4.808E-02 1.43E-02	G K
			136.43	-6.624E-02	%	3.922E-01 1.17E-01	G
CO-60		8.3520E-03					
			1332.51	8.352E-03	%(P	4.560E-02 1.26E-02	G K
			1173.23	1.954E-02	& P	6.327E-02 1.85E-02	G K
Sr-85		-1.9637E-02					
			514.00	-1.964E-02	%(	6.038E-02 1.80E-02	G
Kr-85		-4.5329E+02					
			513.99	-4.533E+02	%(P	1.310E+03 3.89E+02	G
Y-88		0.0000E+00					
			1836.01	0.000E+00	%(	2.629E-02 3.57E-03	G K
			898.02	7.525E-03	& P	4.896E-02 1.37E-02	G
NB-94		1.0706E-02					
			871.10	1.071E-02	%(P	4.868E-02 1.40E-02	G K
			702.50	7.685E-03	% P	4.235E-02 1.21E-02	G K
Ag-108M		-4.1535E-03					
			722.95	-4.154E-03	&(	5.643E-02 1.60E-02	G K
			614.37	-1.208E-03	& P	4.346E-02 1.21E-02	G
			433.93	9.851E-03	%	3.895E-02 1.14E-02	G
CD-109		-2.0821E-02					
			88.04	-2.082E-02	&(P	1.418E+00 4.21E-01	G
SN-113		-1.0284E-02					
			391.71	-1.028E-02	%(	6.757E-02 1.98E-02	G K
			255.04	-6.047E-01	% P	1.786E+00 5.35E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	-4.2549E-03						
		427.95	-4.255E-03	%(P	1.297E-01	3.69E-02	G K
		600.77	-7.284E-03	% P	2.249E-01	6.28E-02	G
		636.15	4.431E-02	& P	3.860E-01	1.10E-01	G
		463.51	2.526E-01	% P	3.450E-01	1.08E-01	G
		176.29	-8.027E-03	% P	5.655E-01	1.66E-01	G
I-131	-4.1034E-03						
		364.48	-4.103E-03	&(	7.380E-02	2.12E-02	G K
		636.97	7.259E-02	%	1.103E+00	3.13E-01	G
		284.29	-1.965E-01	%	1.065E+00	3.15E-01	G
CS-134	3.9671E-03						
		604.66	3.967E-03	%(P	4.189E-02	1.18E-02	G K
		795.76	-1.194E-03	% P	4.767E-02	1.28E-02	G
		569.29	-2.427E-02	% P	2.394E-01	6.71E-02	G
		801.84	1.308E-01	%	4.882E-01	1.42E-01	G
CS-137	2.0606E-02						
		661.62	2.061E-02	&(P	4.316E-02	1.30E-02	G
CE-139	-3.9394E-04						
		165.85	-3.939E-04	&(P	4.488E-02	1.32E-02	G
EU-152	4.6609E-03						
		121.78	4.661E-03	%(P	1.280E-01	3.78E-02	G K
		344.30	-2.112E-03	& P	1.201E-01	3.41E-02	G
		1408.08	9.167E-03	& P	2.610E-01	6.94E-02	G
		964.00	-2.426E-02	% P	4.876E-01	1.37E-01	G
		1112.07	1.584E-01	% P	4.068E-01	1.21E-01	G
		778.90	-1.845E-02	& P	3.088E-01	8.47E-02	G
EU-154	-1.3933E-02						
		123.10	-1.393E-02	%(P	9.471E-02	2.82E-02	G K
		1274.80	-1.521E-02	& P	1.851E-01	5.15E-02	G
		723.30	-7.917E-02	& P	3.042E-01	8.92E-02	G
		1004.80	-1.246E-02	% P	3.235E-01	8.95E-02	G
EU-155	1.1109E-02						
		86.45	1.111E-02	%(	1.714E-01	5.11E-02	G K
		105.31	4.784E-02	%	1.945E-01	5.83E-02	G
HG-203	2.1882E-03						
		279.17	2.188E-03	%(	4.168E-02	1.21E-02	G K
		72.87	-2.158E-01	& P	1.223E+00	3.66E-01	G
		70.83	-4.906E-01	%	2.184E+00	6.55E-01	G
		82.50	-1.881E-01	&	2.451E+00	7.29E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	2.0029E-01						
		583.14	2.003E-01	*(P	4.631E-02	2.24E-02	G
		510.72	3.124E-01	+ P	1.883E-01	6.78E-02	G
PB-212	4.9121E-01						
		238.63	4.804E-01	(P	9.854E-02	3.75E-02	G K
							Energy duplication
		77.11	5.178E-01	(	3.150E-01	1.01E-01	G
		74.81	6.478E-01	& P	6.293E-01	1.95E-01	G
PB-214	3.9327E-01						
		351.99	3.614E-01	(P	1.005E-01	3.94E-02	G K
		295.22	4.548E-01	(P	1.695E-01	6.20E-02	G
							Energy duplication
		77.11	8.304E-01	+ P	5.168E-01	1.65E-01	G
		241.92	-2.083E-01	% P	6.744E-01	2.02E-01	G
BI-212	4.9051E-01						
		727.17	4.905E-01	(P	4.090E-01	1.63E-01	G K
		1620.56	-3.154E-01	%	1.668E+00	4.55E-01	G
		785.42	-5.379E-02	% P	1.994E+00	5.39E-01	G
BI-214	4.0403E-01						
		609.32	4.187E-01	(P	1.016E-01	4.94E-02	G K
		1764.51	3.617E-01	(P	1.518E-01	8.74E-02	G
		1120.28	2.951E-01	% P	3.860E-01	1.24E-01	G
RA-224	7.4037E-01						
		241.00	7.404E-01	%(P	1.172E+00	3.59E-01	G
RA-226	8.9943E-01						
		185.99	8.994E-01	(	1.111E+00	3.44E-01	G
AC-228	7.0446E-01						
		911.07	6.949E-01	(P	2.051E-01	1.03E-01	G K
		968.90	7.664E-01	(P	3.669E-01	1.71E-01	G
		338.40	6.375E-01	(P	3.108E-01	1.25E-01	G
TH-227	-1.7133E-01						
		236.00	-1.713E-01	&(P	4.506E-01	1.36E-01	G K
		256.25	2.144E-02	% P	4.156E-01	1.20E-01	G
PA-234	1.7168E-02						
		98.44	1.717E-02	%(	1.654E-01	4.92E-02	G K
		946.00	1.022E-02	%	2.389E-01	6.55E-02	G
		131.28	7.535E-05	%	1.688E-01	4.96E-02	G
		94.67	-2.046E-01	%	3.294E-01	1.01E-01	G
		883.24	-1.398E-02	&	3.336E-01	9.02E-02	G
		926.70	-4.566E-02	%	4.079E-01	1.13E-01	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26-3.072E-02 %   3.512E-01 9.90E-02 G

TH-234       7.8480E-01
                           63.29-1.361E-01 %(P 2.206E+00 6.50E-01 G K
                           92.80 1.344E+00  (P 1.553E+00 4.78E-01 G
                           92.38 1.530E+00  (P 1.844E+00 5.66E-01 G

AM-241      -1.1218E-03
                           59.54-1.122E-03 &(P 2.888E-01 8.54E-02 G
   ( - This peak used in the nuclide activity average.

   * - Peak is too wide, but only one peak in library.
   ! - Peak is part of a multiplet and this area went
       negative during deconvolution.
   ? - Peak is too narrow.
   @ - Peak is too wide at FW25M, but ok at FWHM.
   % - Peak fails sensitivity test.
   $ - Peak identified, but first peak of this nuclide
       failed one or more qualification tests.
   + - Peak activity higher than counting uncertainty range.
   - - Peak activity lower than counting uncertainty range.
   = - Peak outside analysis energy range.
   & - Calculated peak centroid is not close enough to the
       library energy centroid for positive identification.
   P - Peakbackground subtraction
   } - Peak is too close to another for the activity
       to be found directly.

   Nuclide Codes:                      Peak Codes:
   T - Thermal Neutron Activation      G - Gamma Ray
   F - Fast Neutron Activation         X - X-Ray
   I - Fission Product                 P - Positron Decay
   N - Naturally Occurring Isotope     S - Single-Escape
   P - Photon Reaction                 D - Double-Escape
   C - Charged Particle Reaction       K - Key Line
   M - No MDA Calculation              A - Not in Average
   R - Coincidence Corrected           C - Coincidence Peak
   H - Halflife limit exceeded

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
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***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	1.3454E-01	1.4601E-01	3.9156E-01	3.9165E-01	4.043E-01
K-40		1.2182E+01	1.2182E+01	1.7007E+00	1.8347E+00	
MN-54	#A	-8.8400E-04	-8.9646E-04	3.5131E-01	3.5131E-01	4.706E-02
CO-57	#B	-6.1018E-03	-6.2014E-03	4.2942E-02	4.2943E-02	4.731E-02
CO-60	#B	8.3331E-03	8.3520E-03	3.7771E-02	3.7774E-02	4.550E-02

Sr-85	#A	-1.8357E-02	-1.9637E-02	5.4038E-02	5.4049E-02	5.644E-02
Kr-85	#A	-4.5327E+02	-4.5329E+02	1.3287E+03	1.3289E+03	1.310E+03
Y-88	#B	0.0000E+00	0.0000E+00	1.0701E-02	1.0703E-02	2.523E-02
NB-94	#B	1.0706E-02	1.0706E-02	4.2003E-02	4.2007E-02	4.868E-02
Ag-108M	#B	-4.1532E-03	-4.1535E-03	4.7963E-02	4.7964E-02	5.642E-02
CD-109	#A	-2.0622E-02	-2.0821E-02	2.1170E+00	2.1170E+00	1.404E+00
SN-113	#B	-9.9005E-03	-1.0284E-02	5.9272E-02	5.9275E-02	6.505E-02
SB-125	#B	-4.2365E-03	-4.2549E-03	1.7844E-01	1.7844E-01	1.291E-01
I-131	#B	-2.3830E-03	-4.1034E-03	6.3639E-02	6.3639E-02	4.286E-02
CS-134	#B	3.9442E-03	3.9671E-03	3.5459E-02	3.5460E-02	4.165E-02
CS-137	#A	2.0597E-02	2.0606E-02	3.9060E-02	3.9078E-02	4.315E-02
CE-139	#A	-3.8162E-04	-3.9394E-04	1.0231E-01	1.0231E-01	4.348E-02
EU-152	#B	4.6565E-03	4.6609E-03	1.1346E-01	1.1346E-01	1.279E-01
EU-154	#B	-1.3913E-02	-1.3933E-02	9.5690E-02	9.5693E-02	9.458E-02
EU-155	#B	1.1082E-02	1.1109E-02	1.5323E-01	1.5323E-01	1.710E-01
HG-203	#B	1.9923E-03	2.1882E-03	3.6175E-02	3.6175E-02	3.795E-02
TL-208	#	2.0029E-01	2.0029E-01	6.7060E-02	6.8008E-02	
PB-212	#	4.9121E-01	4.9121E-01	1.1513E-01	1.1843E-01	9.854E-02
PB-214	#	3.9327E-01	3.9327E-01	1.0296E-01	1.0533E-01	1.005E-01
BI-212		4.9051E-01	4.9051E-01	4.8980E-01	4.9058E-01	
BI-214		4.0403E-01	4.0403E-01	1.4304E-01	1.4485E-01	
RA-224	#A	7.4037E-01	7.4037E-01	1.0756E+00	1.0764E+00	1.172E+00
RA-226	#A	8.9942E-01	8.9943E-01	1.0326E+00	1.0338E+00	1.111E+00
AC-228		7.0446E-01	7.0446E-01	2.3381E-01	2.3717E-01	
TH-227	#B	-1.7133E-01	-1.7133E-01	4.1709E-01	4.1720E-01	4.506E-01
PA-234	#B	1.7168E-02	1.7168E-02	1.4749E-01	1.4749E-01	1.654E-01
TH-234	#B	7.8480E-01	7.8480E-01	8.3805E-01	8.3918E-01	2.206E+00
AM-241	#A	-1.1217E-03	-1.1218E-03	7.3253E-01	7.3253E-01	2.888E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (269.6 to 1999.1 keV) 1.3981111E+01 pCi/gm
Total Decayed Activity (269.6 to 1999.1 keV) 1.3981111E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JJM

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 101F_7SEP2006_1501.An1

Sample description
FSS-OOL-05-03-009-F

Spectrum Filename: C:\GammaVision\Spectra\101F_7SEP2006_1501.An1

Acquisition information

Start time:	07-Sep-2006 15:01:19
Live time:	2000
Real time:	2001
Dead time:	0.07 %
Detector ID:	1

Detector system
Det 101- DSPE-633

Calibration

Filename:	D1_1LSa.Clb

Detector 101 1.0 Liter Marinelli Sand

Energy Calibration

Created:	03-Sep-2004 08:50:48
Zero offset:	0.244 keV
Gain:	0.500 keV/channel
Quadratic:	-2.493E-08 keV/channel^2

Efficiency Calibration

Created:	03-Sep-2004 08:52:26
Type:	Polynomial
Uncertainty:	0.626 %
Coefficients:	-0.321775 -5.816463 0.734234
	-0.099357 0.006049 -0.000149

Library Files

Main analysis library:	FSS_Rev_1.Lib
Library Match Width:	1.000
Peak stripping:	Library based

Analysis parameters

Analysis engine:	Env32 G53W4.20
Start channel:	100 (50.23keV)
Stop channel:	4000 (1999.11keV)
Peak rejection level:	41.667%
Peak search sensitivity:	3
Sample Size:	1.0980E+03
Activity scaling factor:	1.0000E+06/(1.0000E+00* 1.0980E+03) = 9.1075E+02
Detection limit method:	Nureg 4.16
Random error:	1.0000000E+00
Systematic error:	1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	01-Sep-2006 08:20:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	101_150K_28APR05.Pbc 01-May-2005 05:24:47
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 12 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.0981

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
74.82	136.	27.50	1.50	1.654E-02	74.81	9.600	1.054E+00	PB212
77.13	183.	20.56	1.50	1.720E-02	77.11	17.500	7.474E-01	PB212
					77.11	10.700	1.197E+00	PB214
77.13	179.	20.56	1.50	1.720E-02	77.11	17.500	PBC<MDA	PB212
					77.11	10.700	1.197E+00	PB214
89.99	63.	33.46	1.02	1.962E-02	88.04	3.790	PBC<MDA	CD109
93.28	106.	21.60	1.02	1.998E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
238.86	535.	5.08	1.12	1.556E-02	238.63	43.100	9.698E-01	PB212
241.71	69.	28.57	1.12	1.541E-02	241.00	3.900	PBC<MDA	RA224
					241.92	7.470	PBC<MDA	PB214
270.69	51.	34.57	1.14	1.398E-02				
278.41	62.	29.72	0.96	1.363E-02				
295.47	110.	20.53	1.35	1.291E-02	295.22	19.200	5.384E-01	PB214
338.41	132.	16.83	1.00	1.135E-02	338.40	12.010	1.168E+00	AC228
352.01	183.	11.71	1.04	1.092E-02	351.99	37.100	5.497E-01	PB214
463.33	38.	32.46	1.50	8.342E-03	463.51	10.000	PBC<MDA	SB125
511.16	102.	16.50	1.98	7.584E-03	510.72	22.500	6.210E-01	TL208
583.42	188.	10.12	1.25	6.681E-03	583.14	86.000	3.976E-01	TL208
609.31	109.	15.91	1.33	6.413E-03	609.32	46.090	4.476E-01	BI214
661.76	224.	9.12	1.45	5.936E-03	661.62	84.620	5.460E-01	CS137
727.64	26.	33.84	1.50	5.443E-03	727.17	11.800	PBC<MDA	BI212
911.23	86.	13.64	1.07	4.446E-03	911.07	29.000	8.049E-01	AC228
968.10	70.	18.93	1.41	4.215E-03	968.90	17.460	1.159E+00	AC228
1121.55	49.	23.40	1.95	3.711E-03	1120.28	15.040	1.085E+00	BI214
1461.07	413.	5.00	1.87	2.942E-03	1460.75	10.700	1.605E+01	K40

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
179.56	90.31	192.	63.	0.032	100.38	1.016	PB-214	lD
477.42	238.82	102.	535.	0.268	15.24	1.122	PB-212	D
483.12	241.66	158.	69.	0.034	85.72	1.124	PB-214	D
541.10	270.69	106.	51.	0.025	103.71	1.139	AC-228	s
556.54	278.41	126.	47.	0.024	110.22	0.965	SB-126	s

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-212	149.21	74.82	688.	136.	0.068	82.50	1.499
PB-212	153.79	77.11	615.	183.	0.091	61.69	1.499D
PB-214	153.79	77.11	619.	179.	0.090	61.69	1.499D
TH-234	186.03	93.22	485.	112.	0.056	79.82	1.499s
TH-234	185.97	93.20	494.	118.	0.059	80.33	1.499s
PB-212	477.30	238.80	284.	420.	0.210	22.07	1.499
PB-214	590.39	295.32	116.	85.	0.043	61.37	1.499
AC-228	676.60	338.41	126.	129.	0.065	50.48	1.003
PB-214	704.14	352.17	70.	160.	0.080	32.02	1.499
SB-125	926.57	463.33	65.	38.	0.019	97.38	1.499s
TL-208	1022.27	511.16	75.	86.	0.043	49.51	1.977s
TL-208	1166.85	583.42	55.	186.	0.093	30.37	1.251
BI-214	1218.65	609.31	61.	107.	0.054	47.74	1.335
CS-137	1323.60	661.76	50.	223.	0.111	27.35	1.453
BI-212	1455.43	727.64	27.	26.	0.013	101.51	1.499s
AC-228	1822.82	911.23	19.	84.	0.042	40.93	1.070
AC-228	1936.61	968.10	34.	69.	0.035	56.79	1.415s
BI-214	2243.69	1121.55	23.	49.	0.025	70.20	1.953s
K-40	2923.16	1461.07	5.	411.	0.205	14.99	1.867

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Activity pCi/gm	Code	MDA Value pCi/gm	COMMENTS
BE-7		2.1589E-01					
			477.56	2.159E-01	%(	6.636E-01 1.97E-01	G
K-40		1.6051E+01					
			1460.75	1.605E+01	(P	5.285E-01 8.07E-01	G
MN-54		-1.4708E-03					
			834.81	-1.471E-03	%(P	7.072E-02 1.92E-02	G
CO-57		-1.7800E-03					
			122.07	-1.780E-03	%(	6.394E-02 1.89E-02	G K
			136.43	1.827E-02	%	5.216E-01 1.54E-01	G
CO-60		-1.3104E-02					
			1332.51	-1.310E-02	%(P	9.388E-02 2.62E-02	G K
			1173.23	-1.076E-02	% P	9.930E-02 2.79E-02	G K
Sr-85		-1.5783E-02					
			514.00	-1.578E-02	%(	8.754E-02 2.57E-02	G
Kr-85		-3.8479E+02					
			513.99	-3.848E+02	%(P	1.900E+03 5.54E+02	G
Y-88		-7.2154E-03					
			1836.01	-7.215E-03	%(	7.132E-02 1.83E-02	G K
			898.02	1.874E-02	% P	7.238E-02 2.08E-02	G
NB-94		-1.8755E-02					
			871.10	-1.876E-02	%(P	6.854E-02 1.98E-02	G K
			702.50	3.143E-03	& P	5.370E-02 1.47E-02	G K
Ag-108M		-4.2950E-03					
			722.95	-4.295E-03	%(	7.393E-02 2.07E-02	G K
			614.37	1.089E-02	& P	6.514E-02 1.86E-02	G
			433.93	4.517E-03	&	5.469E-02 1.56E-02	G
CD-109		-2.1065E-02					
			88.04	-2.107E-02	%(P	1.951E+00 5.78E-01	G
SN-113		-1.3319E-02					
			391.71	-1.332E-02	%(	9.380E-02 2.73E-02	G K
			255.04	-6.627E-04	& P	2.701E+00 7.85E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	1.4413E-01						
		427.95	5.628E-04	&(P	1.888E-01	5.35E-02	G K
		600.77	-3.818E-02	% P	3.620E-01	1.03E-01	G
		636.15	7.127E-03	% P	5.019E-01	1.38E-01	G
		463.51	5.691E-01	*(P	5.977E-01	1.92E-01	G
		176.29	-2.034E-01	% P	7.371E-01	2.18E-01	G
I-131	2.6240E-03						
		364.48	2.624E-03	%(	1.300E-01	3.75E-02	G K
		636.97	-3.123E-01	%	1.762E+00	5.10E-01	G
		284.29	-7.340E-02	%	1.474E+00	4.28E-01	G
CS-134	2.3718E-03						
		604.66	2.372E-03	&(P	7.667E-02	2.17E-02	G K
		795.76	4.565E-02	% P	6.285E-02	2.02E-02	G
		569.29	2.320E-02	% P	3.747E-01	1.05E-01	G
		801.84	-1.052E-01	%	7.514E-01	2.12E-01	G
CS-137	5.4602E-01						
		661.62	5.460E-01	(P	8.754E-02	5.00E-02	G
CE-139	5.9372E-04						
		165.85	5.937E-04	&(P	7.411E-02	2.18E-02	G
EU-152	-2.3578E-03						
		121.78	-2.358E-03	%(P	1.783E-01	5.24E-02	G K
		344.30	3.057E-02	& P	1.885E-01	5.49E-02	G
		1408.08	-3.628E-03	% P	3.334E-01	8.47E-02	G
		964.00	-9.819E-03	% P	6.092E-01	1.67E-01	G
		1112.07	1.775E-01	& P	5.622E-01	1.64E-01	G
		778.90	7.180E-02	% P	4.463E-01	1.25E-01	G
EU-154	-1.1358E-02						
		123.10	-1.136E-02	%(P	1.329E-01	3.93E-02	G K
		1274.80	1.017E-02	& P	2.553E-01	6.96E-02	G
		723.30	-8.537E-02	% P	3.852E-01	1.11E-01	G
		1004.80	4.930E-02	& P	4.588E-01	1.28E-01	G
EU-155	-2.1006E-03						
		86.45	-2.101E-03	%(	2.419E-01	7.18E-02	G K
		105.31	1.194E-01	%	2.479E-01	7.52E-02	G
HG-203	1.8213E-02						
		279.17	1.821E-02	%(	7.051E-02	2.09E-02	G K
		72.87	-3.636E-01	% P	1.841E+00	5.51E-01	G
		70.83	8.724E-01	&	2.328E+00	7.02E-01	G
		82.50	1.162E+00	&	3.663E+00	1.10E+00	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	3.9762E-01						
		583.14	3.976E-01	(P	7.998E-02	4.08E-02	G
		510.72	6.210E-01	+ P	3.100E-01	1.22E-01	G
PB-212	7.6333E-01						
		238.63	7.698E-01	(P	1.490E-01	5.75E-02	G K
							Energy duplication
		77.11	7.474E-01	(	4.836E-01	1.54E-01	G
		74.81	1.054E+00	& P	9.686E-01	3.01E-01	G
PB-214	4.6332E-01						
		351.99	4.847E-01	(P	1.265E-01	5.24E-02	G K
		295.22	4.220E-01	(P	2.626E-01	8.81E-02	G
							Energy duplication
		77.11	1.197E+00	+ P	7.933E-01	2.51E-01	G
		241.92	-1.894E-02	% P	1.077E+00	3.18E-01	G
BI-212	4.9165E-01						
		727.17	4.917E-01	*(P	5.177E-01	1.71E-01	G K
		1620.56	4.588E-01	%	2.409E+00	6.55E-01	G
		785.42	1.112E+00	% P	3.408E+00	1.00E+00	G
BI-214	4.4761E-01						
		609.32	4.476E-01	(P	1.622E-01	7.20E-02	G K
		1764.51	2.432E-01	% P	3.555E-01	1.18E-01	G
		1120.28	1.085E+00	+ P	5.503E-01	2.56E-01	G
RA-224	8.9549E-01						
		241.00	8.955E-01	%(P	1.862E+00	5.64E-01	G
RA-226	1.1990E+00						
							Energy duplication
		185.99	1.199E+00	%(	1.788E+00	5.49E-01	G
AC-228	8.0491E-01						
		911.07	8.049E-01	(P	2.180E-01	1.12E-01	G K
		968.90	1.159E+00	+ P	4.982E-01	2.22E-01	G
		338.40	1.168E+00	+ P	4.962E-01	2.00E-01	G
TH-227	-6.0498E-02						
		236.00	-6.050E-02	&(P	5.393E-01	1.59E-01	G K
		256.25	1.878E-01	% P	7.779E-01	2.31E-01	G
PA-234	6.2129E-02						
		98.44	6.213E-02	%(	2.228E-01	6.68E-02	G K
		946.00	8.431E-02	%	3.223E-01	9.28E-02	G
		131.28	1.176E-01	&	2.710E-01	8.20E-02	G
		94.67	-1.666E-01	%	4.275E-01	1.29E-01	G
		883.24	-3.017E-02	%	5.922E-01	1.63E-01	G
		926.70	-2.821E-03	%	5.812E-01	1.56E-01	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26 3.454E-02 %   5.511E-01 1.55E-01 G

TH-234       1.8850E+00
                           63.29 9.267E-01 %(P 2.955E+00 8.85E-01 G K
                           92.80 2.427E+00 *(P 2.193E+00 6.84E-01 G
                           92.38 2.706E+00 &(P 2.542E+00 7.90E-01 G

AM-241       5.6852E-02
                           59.54 5.685E-02 %(P 3.913E-01 1.16E-01 G
   ( - This peak used in the nuclide activity average.

   * - Peak is too wide, but only one peak in library.
   ! - Peak is part of a multiplet and this area went
       negative during deconvolution.
   ? - Peak is too narrow.
   @ - Peak is too wide at FW25M, but ok at FWHM.
   % - Peak fails sensitivity test.
   $ - Peak identified, but first peak of this nuclide
       failed one or more qualification tests.
   + - Peak activity higher than counting uncertainty range.
   - - Peak activity lower than counting uncertainty range.
   = - Peak outside analysis energy range.
   & - Calculated peak centroid is not close enough to the
       library energy centroid for positive identification.
   P - Peakbackground subtraction
   } - Peak is too close to another for the activity
       to be found directly.

   Nuclide Codes:                      Peak Codes:
   T - Thermal Neutron Activation      G - Gamma Ray
   F - Fast Neutron Activation         X - X-Ray
   I - Fission Product                 P - Positron Decay
   N - Naturally Occurring Isotope     S - Single-Escape
   P - Photon Reaction                 D - Double-Escape
   C - Charged Particle Reaction       K - Key Line
   M - No MDA Calculation              A - Not in Average
   R - Coincidence Corrected           C - Coincidence Peak
   H - Halflife limit exceeded

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
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***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	1.9900E-01	2.1589E-01	5.9162E-01	5.9175E-01	6.117E-01
K-40		1.6051E+01	1.6051E+01	2.4193E+00	2.5838E+00	
MN-54	#A	-1.4504E-03	-1.4708E-03	3.8206E-01	3.8206E-01	6.974E-02
CO-57	#B	-1.7516E-03	-1.7800E-03	5.6608E-02	5.6608E-02	6.292E-02
CO-60	#B	-1.3074E-02	-1.3104E-02	8.2788E-02	8.2791E-02	9.367E-02

Sr-85	#A	-1.4759E-02	-1.5783E-02	7.7005E-02	7.7010E-02	8.186E-02
Kr-85	#A	-3.8477E+02	-3.8479E+02	2.0985E+03	2.0986E+03	1.900E+03
Y-88	#B	-6.9267E-03	-7.2154E-03	5.4906E-02	5.4907E-02	6.846E-02
NB-94	#B	-1.8755E-02	-1.8755E-02	6.1801E-02	6.1810E-02	6.854E-02
Ag-108M	#B	-4.2946E-03	-4.2950E-03	6.1960E-02	6.1960E-02	7.393E-02
CD-109	#A	-2.0864E-02	-2.1065E-02	3.8385E+00	3.8385E+00	1.932E+00
SN-113	#B	-1.2825E-02	-1.3319E-02	8.1896E-02	8.1899E-02	9.032E-02
SB-125	#B	1.4351E-01	1.4413E-01	1.4564E-01	1.4587E-01	1.880E-01
I-131	#B	1.5272E-03	2.6240E-03	1.1252E-01	1.1252E-01	7.565E-02
CS-134	#B	2.3582E-03	2.3718E-03	6.5118E-02	6.5119E-02	7.623E-02
CS-137		5.4581E-01	5.4602E-01	1.4994E-01	1.5308E-01	
CE-139	#A	5.7522E-04	5.9372E-04	6.5506E-02	6.5506E-02	7.180E-02
EU-152	#B	-2.3556E-03	-2.3578E-03	7.7500E-01	7.7500E-01	1.782E-01
EU-154	#B	-1.1342E-02	-1.1358E-02	1.4869E-01	1.4869E-01	1.327E-01
EU-155	#B	-2.0955E-03	-2.1006E-03	2.1542E-01	2.1542E-01	2.413E-01
HG-203	#B	1.6589E-02	1.8213E-02	6.2802E-02	6.2811E-02	6.423E-02
TL-208		3.9762E-01	3.9762E-01	1.2231E-01	1.2436E-01	
PB-212	#	7.6333E-01	7.6333E-01	1.7094E-01	1.7630E-01	1.490E-01
PB-214	#	4.6332E-01	4.6332E-01	1.5019E-01	1.5245E-01	1.265E-01
BI-212	#A	4.9165E-01	4.9165E-01	5.1226E-01	5.1301E-01	5.177E-01
BI-214		4.4761E-01	4.4761E-01	2.1590E-01	2.1737E-01	
RA-224	#A	8.9549E-01	8.9549E-01	1.6932E+00	1.6940E+00	1.862E+00
RA-226	#A	1.1990E+00	1.1990E+00	1.6455E+00	1.6469E+00	1.788E+00
AC-228		8.0491E-01	8.0491E-01	3.3671E-01	3.3976E-01	
TH-227	#B	-6.0498E-02	-6.0498E-02	5.2780E-01	5.2781E-01	5.393E-01
PA-234	#B	6.2129E-02	6.2129E-02	2.0032E-01	2.0035E-01	2.228E-01
TH-234	#B	1.8850E+00	1.8850E+00	1.5937E+00	1.5972E+00	2.955E+00
AM-241	#A	5.6851E-02	5.6852E-02	3.4922E-01	3.4923E-01	3.913E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (249.1 to 1999.1 keV) 1.8247293E+01 pCi/gm
Total Decayed Activity (249.1 to 1999.1 keV) 1.8247509E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JJM

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 101F_7SEPT2006_0954.An1

Sample description
FSS-OOL-05-03-004-F

Spectrum Filename: C:\GammaVision\Spectra\101F_7SEPT2006_0954.An1

Acquisition information
Start time: 07-Sep-2006 09:54:57
Live time: 2000
Real time: 2002
Dead time: 0.08 %
Detector ID: 1

Detector system
Det 101- DSPE-633

Calibration
Filename: D1_1LSa.Clb
Detector 101 1.0 Liter Marinelli Sand

Energy Calibration
Created: 03-Sep-2004 08:50:48
Zero offset: 0.244 keV
Gain: 0.500 keV/channel
Quadratic: -2.493E-08 keV/channel^2

Efficiency Calibration
Created: 03-Sep-2004 08:52:26
Type: Polynomial
Uncertainty: 0.626 %
Coefficients: -0.321775 -5.816463 0.734234
-0.099357 0.006049 -0.000149

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.23keV)
Stop channel: 4000 (1999.11keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 1.0860E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.0860E+03) =
9.2081E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	01-Sep-2006 07:15:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	101_150K_28APR05.Pbc 01-May-2005 05:24:47
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 12 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.1829

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
74.71	138.	26.45	1.50	1.654E-02	70.83	3.520	3.540E+00	HG203
					74.81	9.600	1.084E+00	PB212
77.09	220.	17.32	1.50	1.720E-02	77.11	10.700	1.486E+00	PB214
					77.11	17.500	9.086E-01	PB212
77.09	224.	17.32	1.50	1.720E-02	77.11	10.700	1.486E+00	PB214
					77.11	17.500	9.240E-01	PB212
90.13	97.	23.39	1.02	1.964E-02	88.04	3.790	PBC<MDA	CD109
92.93	103.	23.38	1.02	1.994E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
186.30	81.	34.61	0.83	1.856E-02	185.99	3.280	1.654E+00	RA226
209.31	49.	33.70	1.36	1.721E-02				
238.69	346.	8.38	1.50	1.540E-02	238.63	43.100	PBC<MDA	PB212
238.83	592.	4.69	1.12	1.556E-02	238.63	43.100	1.087E+00	PB212
241.82	65.	28.90	1.12	1.541E-02	241.00	3.900	PBC<MDA	RA224
295.27	120.	16.70	1.16	1.292E-02	295.22	19.200	5.940E-01	PB214
300.45	41.	34.81	1.17	1.271E-02				
338.51	132.	14.34	1.21	1.135E-02	338.40	12.010	1.182E+00	AC228
352.05	171.	11.19	1.37	1.092E-02	351.99	37.100	5.189E-01	PB214
462.85	45.	38.85	0.78	8.353E-03				
462.85	45.	38.85	0.78	8.353E-03	463.51	10.000	6.494E-01	SB125
510.69	74.	21.12	1.27	7.591E-03	510.72	22.500	4.231E-01	TL208
583.15	184.	9.83	1.58	6.684E-03	583.14	86.000	3.938E-01	TL208
609.38	146.	16.12	1.63	6.412E-03	609.32	46.090	6.092E-01	BI214
661.71	27.	35.54	1.50	5.937E-03	661.62	84.620	PBC<MDA	CS137
727.41	47.	22.13	1.29	5.441E-03	727.17	11.800	8.936E-01	BI212
911.38	122.	11.52	1.44	4.445E-03	911.07	29.000	1.159E+00	AC228
967.94	88.	15.05	1.44	4.216E-03	968.90	17.460	1.477E+00	AC228

1119.92	53.	29.21	2.01	3.711E-03	1120.28	15.040	1.184E+00	BI214
1460.75	446.	4.86	1.76	2.942E-03	1460.75	10.700	1.754E+01	K40

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
1764.62	29.	18.57	3.12	2.481E-03	1764.51	15.920	8.997E-01	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
179.92	90.48	282.	63.	0.032	119.08	1.016	PB-214	D
185.52	93.27	249.	92.	0.046	78.75	1.018	U-235	D
418.29	209.31	119.	49.	0.025	101.10	1.357	AC-228	s
477.35	238.84	89.	592.	0.296	14.06	1.122	PB-212	D
483.34	241.83	144.	65.	0.033	86.69	1.124	PB-214	D
600.65	300.45	76.	41.	0.021	104.44	1.173	PB-212	

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-212	148.99	74.71	654.	138.	0.069	79.35	1.499
PB-214	153.79	77.11	642.	220.	0.110	51.97	1.499D
PB-212	153.79	77.11	638.	224.	0.112	51.97	1.499D
TH-234	185.87	93.14	604.	107.	0.054	91.69	1.499s
TH-234	185.86	93.14	576.	115.	0.057	88.26	1.499s
RA-226	371.90	186.12	306.	82.	0.041	96.49	1.499
PB-212	477.33	238.82	267.	451.	0.225	20.55	1.499
PB-214	477.08	238.69	249.	346.	0.173	25.13	1.499s
PB-214	590.81	295.53	124.	105.	0.052	52.91	1.499
AC-228	676.80	338.51	85.	130.	0.065	43.02	1.209
PB-214	703.92	352.06	75.	164.	0.082	32.03	1.499s
SB-125	925.57	462.84	44.	30.	0.015	103.46	1.499s
TL-208	1021.32	510.69	75.	58.	0.029	63.36	1.275s
TL-208	1166.31	583.15	46.	182.	0.091	29.50	1.581s
BI-214	1218.80	609.38	100.	145.	0.072	48.37	1.633s
CS-137	1323.51	661.71	37.	27.	0.014	106.63	1.499s
BI-212	1454.98	727.41	26.	46.	0.023	66.39	1.293
AC-228	1823.12	911.38	29.	120.	0.060	34.57	1.444
AC-228	1936.30	967.94	26.	87.	0.044	45.16	1.439
BI-214	2240.43	1119.92	47.	53.	0.027	87.62	2.011s
K-40	2922.52	1460.75	8.	444.	0.222	14.58	1.755
BI-214	3530.67	1764.62	0.	29.	0.014	55.71	3.123s

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	Peak MDA Value pCi/gm		COMMENTS
BE-7		2.2796E-01						
			477.56	2.280E-01	%(	6.477E-01	1.93E-01	G
K-40		1.7537E+01						
			1460.75	1.754E+01	(P	6.371E-01	8.57E-01	G
MN-54		-1.9425E-03						
			834.81	-1.942E-03	%(P	7.988E-02	2.20E-02	G
CO-57		-5.4963E-05						
			122.07	-5.496E-05	%(	6.375E-02	1.88E-02	G K
			136.43	1.419E-01	%	3.722E-01	1.12E-01	G
CO-60		1.4175E-02						
			1332.51	1.417E-02	&(P	8.902E-02	2.49E-02	G K
			1173.23	1.367E-02	% P	9.911E-02	2.80E-02	G K
Sr-85		-4.2860E-02						
			514.00	-4.286E-02	%(	9.470E-02	2.86E-02	G
Kr-85		-9.7206E+02						
			513.99	-9.721E+02	%(P	2.058E+03	6.19E+02	G
Y-88		-8.7123E-03						
			1836.01	-8.712E-03	%(	7.809E-02	2.04E-02	G K
			898.02	6.606E-03	& P	8.631E-02	2.41E-02	G
NB-94		6.4368E-04						
			871.10	6.437E-04	%(P	7.294E-02	1.99E-02	G K
			702.50	1.993E-02	% P	6.882E-02	2.02E-02	G K
Ag-108M		-1.9594E-03						
			722.95	-1.959E-03	%(	6.481E-02	1.77E-02	G K
			614.37	-3.385E-03	% P	8.047E-02	2.28E-02	G
			433.93	2.141E-02	%	5.283E-02	1.58E-02	G
CD-109		-8.3975E-03						
			88.04	-8.398E-03	&(P	2.154E+00	6.39E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SN-113	-2.0291E-02						
		391.71	-2.029E-02	%(	9.649E-02	2.83E-02	G K
		255.04	4.075E-03	% P	2.647E+00	7.68E-01	G
SB-125	1.4662E-01						
		427.95	4.576E-02	%(P	1.581E-01	4.64E-02	G K
		600.77	-5.577E-03	& P	3.862E-01	1.09E-01	G
		636.15	-4.765E-02	% P	5.874E-01	1.65E-01	G
		463.51	4.452E-01	(P	5.016E-01	1.61E-01	G
		176.29	2.184E-03	& P	8.315E-01	2.43E-01	G
I-131	-3.9001E-04						
		364.48	-3.900E-04	&(	1.071E-01	3.05E-02	G K
		636.97	-1.274E-01	%	1.457E+00	4.11E-01	G
		284.29	-2.002E-01	&	1.561E+00	4.58E-01	G
CS-134	5.6002E-03						
		604.66	5.600E-03	&(P	7.359E-02	2.09E-02	G K
		795.76	2.633E-02	% P	9.692E-02	2.83E-02	G
		569.29	-7.034E-02	% P	4.373E-01	1.26E-01	G
		801.84	-1.400E-03	%	7.897E-01	2.16E-01	G
CS-137	6.7287E-02						
		661.62	6.729E-02	(P	7.650E-02	2.47E-02	G
CE-139	9.0438E-03						
		165.85	9.044E-03	%(P	7.044E-02	2.09E-02	G
EU-152	3.1547E-04						
		121.78	3.155E-04	%(P	1.890E-01	5.57E-02	G K
		344.30	-3.169E-03	% P	2.192E-01	6.29E-02	G
		1408.08	2.496E-02	% P	3.220E-01	8.43E-02	G
		964.00	-9.317E-03	& P	1.291E+00	3.75E-01	G
		1112.07	-4.306E-02	& P	6.764E-01	1.87E-01	G
		778.90	-6.085E-02	% P	4.621E-01	1.29E-01	G
EU-154	-7.0092E-03						
		123.10	-7.009E-03	&(P	1.429E-01	4.22E-02	G K
		1274.80	5.984E-02	& P	2.304E-01	6.62E-02	G
		723.30	-3.869E-03	% P	4.576E-01	1.29E-01	G
		1004.80	-1.011E-02	% P	4.904E-01	1.35E-01	G
EU-155	0.0000E+00						
		86.45	0.000E+00	%(	2.736E-01	8.14E-02	G K
		105.31	6.705E-02	%	2.828E-01	8.47E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
HG-203	1.5436E-02						
		279.17	1.544E-02	%(	7.637E-02	2.26E-02	G K
		72.87	-6.543E-01	% P	1.888E+00	5.68E-01	G
		70.83	-1.772E+00	&	3.141E+00	9.56E-01	G
		82.50	-5.707E-01	&	3.867E+00	1.15E+00	G
TL-208	3.9987E-01						
		583.14	3.938E-01	@(P	7.434E-02	3.92E-02	G
		510.72	4.231E-01	*(P	3.136E-01	1.14E-01	G
PB-212	8.6103E-01						
		238.63	8.355E-01	(P	1.463E-01	5.80E-02	G K
							Energy duplication
		77.11	9.240E-01	(	4.978E-01	1.60E-01	G
		74.81	1.084E+00	& P	9.551E-01	2.97E-01	G
PB-214	5.0974E-01						
		351.99	5.021E-01	*(P	1.326E-01	5.43E-02	G K
		295.22	5.245E-01	(P	2.744E-01	9.41E-02	G
							Energy duplication
		77.11	1.486E+00	+ P	8.165E-01	2.62E-01	G
		241.92	3.742E+00	+ P	8.247E-01	3.14E-01	G
BI-212	8.9358E-01						
		727.17	8.936E-01	(P	5.118E-01	2.01E-01	G K
		1620.56	8.506E-01	%	2.669E+00	7.71E-01	G
		785.42	2.371E+00	% P	3.445E+00	1.09E+00	G
BI-214	6.8376E-01						
		609.32	6.092E-01	@(P	2.079E-01	9.90E-02	G K
		1764.51	8.997E-01	(P	2.322E-01	1.70E-01	G
		1120.28	1.184E+00	+ P	7.718E-01	3.48E-01	G
RA-224	1.0966E+00						
		241.00	1.097E+00	%(P	1.763E+00	5.39E-01	G
RA-226	1.6732E+00						
		185.99	1.673E+00	(	1.721E+00	5.38E-01	G
AC-228	1.2588E+00						
		911.07	1.159E+00	(P	2.678E-01	1.36E-01	G K
		968.90	1.477E+00	(P	4.457E-01	2.24E-01	G
		338.40	1.182E+00	(P	4.181E-01	1.72E-01	G
TH-227	-1.0892E-01						
		236.00	-1.089E-01	%(P	6.483E-01	1.93E-01	G K
		256.25	-1.216E-02	% P	9.494E-01	2.77E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
PA-234	-4.6087E-02						
		98.44	-4.609E-02	&(	2.541E-01	7.59E-02	G K
		946.00	1.179E-02	%	3.591E-01	9.80E-02	G
		131.28	4.300E-02	%	2.801E-01	8.33E-02	G
		94.67	-5.209E-02	%	4.204E-01	1.25E-01	G
		883.24	-2.399E-02	%	5.715E-01	1.57E-01	G
		926.70	0.000E+00	%	8.534E-01	2.38E-01	G
		569.26	-9.976E-02	%	6.284E-01	1.81E-01	G
TH-234	1.7918E+00						
		63.29	7.891E-01	%(P	3.147E+00	9.40E-01	G K
		92.80	2.388E+00	(P	2.389E+00	7.40E-01	G
		92.38	2.618E+00	(P	2.860E+00	8.81E-01	G
AM-241	6.5835E-02						
		59.54	6.584E-02	%(P	4.191E-01	1.25E-01	G

(- This peak used in the nuclide activity average.

* - Peak is too wide, but only one peak in library.
! - Peak is part of a multiplet and this area went negative during deconvolution.
? - Peak is too narrow.
@ - Peak is too wide at FW25M, but ok at FWHM.
% - Peak fails sensitivity test.
$ - Peak identified, but first peak of this nuclide failed one or more qualification tests.
+ - Peak activity higher than counting uncertainty range.
- - Peak activity lower than counting uncertainty range.
= - Peak outside analysis energy range.
& - Calculated peak centroid is not close enough to the library energy centroid for positive identification.
P - Peakbackground subtraction
} - Peak is too close to another for the activity to be found directly.

Nuclide Codes:	Peak Codes:
T - Thermal Neutron Activation	G - Gamma Ray
F - Fast Neutron Activation	X - X-Ray
I - Fission Product	P - Positron Decay
N - Naturally Occurring Isotope	S - Single-Escape
P - Photon Reaction	D - Double-Escape
C - Charged Particle Reaction	K - Key Line
M - No MDA Calculation	A - Not in Average
R - Coincidence Corrected	C - Coincidence Peak
H - Halflife limit exceeded	

- -

***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	2.1058E-01	2.2796E-01	5.7923E-01	5.7937E-01	5.983E-01
K-40		1.7537E+01	1.7537E+01	2.5705E+00	2.7549E+00	
MN-54	#A	-1.9163E-03	-1.9425E-03	2.3725E-01	2.3725E-01	7.880E-02
CO-57	#B	-5.4107E-05	-5.4963E-05	5.6317E-02	5.6317E-02	6.275E-02
CO-60	#B	1.4144E-02	1.4175E-02	7.4731E-02	7.4736E-02	8.882E-02
Sr-85	#A	-4.0149E-02	-4.2860E-02	8.5920E-02	8.5954E-02	8.871E-02
Kr-85	#A	-9.7202E+02	-9.7206E+02	2.0391E+03	2.0399E+03	2.058E+03
Y-88	#B	-8.3729E-03	-8.7123E-03	6.1246E-02	6.1248E-02	7.505E-02
NB-94	#B	6.4368E-04	6.4368E-04	5.9831E-02	5.9831E-02	7.294E-02
Ag-108M	#B	-1.9592E-03	-1.9594E-03	5.3226E-02	5.3227E-02	6.481E-02
CD-109	#A	-8.3194E-03	-8.3975E-03	8.8147E+01	8.8147E+01	2.134E+00
SN-113	#B	-1.9557E-02	-2.0291E-02	8.5027E-02	8.5035E-02	9.300E-02
SB-125	#B	1.4600E-01	1.4662E-01	1.5908E-01	1.5929E-01	1.575E-01
I-131	#B	-2.3028E-04	-3.9001E-04	9.1480E-02	9.1480E-02	6.323E-02
CS-134	#B	5.5688E-03	5.6002E-03	6.2725E-02	6.2726E-02	7.317E-02
CS-137	#A	6.7261E-02	6.7287E-02	7.4082E-02	7.4179E-02	7.647E-02
CE-139	#A	8.7695E-03	9.0438E-03	6.2640E-02	6.2642E-02	6.830E-02
EU-152	#B	3.1518E-04	3.1547E-04	1.6702E-01	1.6702E-01	1.888E-01
EU-154	#B	-6.9996E-03	-7.0092E-03	1.8598E-01	1.8598E-01	1.427E-01
EU-155	#B	0.0000E+00	0.0000E+00	2.4413E-01	2.4413E-01	2.729E-01
HG-203	#B	1.4095E-02	1.5436E-02	6.7772E-02	6.7777E-02	6.974E-02
TL-208	#	3.9987E-01	3.9987E-01	1.1952E-01	1.2163E-01	
PB-212	#	8.6103E-01	8.6103E-01	1.7936E-01	1.8584E-01	1.463E-01
PB-214	#	5.0974E-01	5.0974E-01	1.6012E-01	1.6269E-01	1.326E-01
BI-212		8.9358E-01	8.9358E-01	6.0201E-01	6.0412E-01	
BI-214		6.8376E-01	6.8376E-01	2.5526E-01	2.5816E-01	
RA-224	#A	1.0966E+00	1.0966E+00	1.6174E+00	1.6186E+00	1.763E+00
RA-226	#A	1.6732E+00	1.6732E+00	1.6144E+00	1.6172E+00	1.721E+00
AC-228		1.2588E+00	1.2588E+00	3.0313E-01	3.1137E-01	
TH-227	#B	-1.0892E-01	-1.0892E-01	6.1201E-01	6.1204E-01	6.483E-01
PA-234	#B	-4.6087E-02	-4.6087E-02	2.2761E-01	2.2763E-01	2.541E-01
TH-234	#B	1.7918E+00	1.7918E+00	1.6667E+00	1.6697E+00	3.147E+00
AM-241	#A	6.5834E-02	6.5835E-02	3.7470E-01	3.7471E-01	4.191E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

YAEC Chemistry Lab Spectrum name: 101F_7SEPT2006_0954.An1

---------- S U M M A R Y ----------

Total Activity (295.1 to 1999.1 keV) 2.0772934E+01 pCi/gm
Total Decayed Activity (295.1 to 1999.1 keV) 2.0772934E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JPK

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 101F_7SEPT2006_1034.An1

Sample description
FSS-OOL-05-03-003-F

Spectrum Filename: C:\GammaVision\Spectra\101F_7SEPT2006_1034.An1

Acquisition information
Start time: 07-Sep-2006 10:34:05
Live time: 2000
Real time: 2001
Dead time: 0.07 %
Detector ID: 1

Detector system
Det 101- DSPE-633

Calibration
Filename: D1_1LSa.Clb
Detector 101 1.0 Liter Marinelli Sand

Energy Calibration
Created: 03-Sep-2004 08:50:48
Zero offset: 0.244 keV
Gain: 0.500 keV/channel
Quadratic: -2.493E-08 keV/channel^2

Efficiency Calibration
Created: 03-Sep-2004 08:52:26
Type: Polynomial
Uncertainty: 0.626 %
Coefficients: -0.321775 -5.816463 0.734234
-0.099357 0.006049 -0.000149

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.23keV)
Stop channel: 4000 (1999.11keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 9.0400E+02
Activity scaling factor: 1.0000E+06/(1.0000E+00* 9.0400E+02) =
1.1062E+03
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	01-Sep-2006 07:55:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	101_150K_28APR05.Pbc 01-May-2005 05:24:47
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 11 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.0463

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
74.74	160.	16.71	1.00	1.651E-02				
74.74	160.	16.71	1.00	1.651E-02	74.81	9.600	1.460E+00	PB212
77.09	264.	10.50	1.01	1.719E-02				
77.09	264.	10.50	1.01	1.719E-02	77.11	10.700	2.112E+00	PB214
					77.11	17.500	1.310E+00	PB212
93.15	84.	34.25	1.50	1.989E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
93.16	77.	35.96	1.50	1.985E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
128.90	81.	34.92	1.13	2.110E-02				
186.03	114.	24.65	1.16	1.858E-02	185.99	3.280	2.786E+00	RA226
210.02	47.	39.39	1.00	1.717E-02				
238.79	471.	5.41	1.12	1.557E-02	238.63	43.100	1.034E+00	PB212
241.74	71.	26.27	1.12	1.541E-02	241.00	3.900	PBC<MDA	RA224
					241.92	7.470	PBC<MDA	PB214
277.46	33.	40.09	0.80	1.368E-02				
295.46	106.	15.82	1.67	1.291E-02	295.22	19.200	6.256E-01	PB214
301.24	65.	24.43	0.82	1.268E-02				
338.42	123.	17.82	1.18	1.135E-02	338.40	12.010	1.324E+00	AC228
352.18	173.	11.68	1.11	1.092E-02	351.99	37.100	6.322E-01	PB214
462.79	27.	35.54	1.50	8.342E-03	463.51	10.000	PBC<MDA	SB125
510.93	92.	19.07	1.76	7.588E-03	510.72	22.500	6.694E-01	TL208
583.16	154.	10.82	1.13	6.684E-03	583.14	86.000	3.945E-01	TL208
609.33	143.	10.11	1.56	6.413E-03	609.32	46.090	7.176E-01	BI214
661.55	98.	17.42	1.76	5.938E-03	661.62	84.620	2.879E-01	CS137
727.51	44.	30.86	1.41	5.441E-03	727.17	11.800	1.008E+00	BI212
911.23	99.	11.32	0.87	4.446E-03	911.07	29.000	1.121E+00	AC228

968.34	94.	15.12	1.98	4.214E-03	968.90	17.460	1.896E+00	AC228
1120.06	30.	37.99	1.50	3.711E-03	1120.28	15.040	8.147E-01	BI214
1460.79	398.	5.20	2.04	2.942E-03	1460.75	10.700	1.880E+01	K40
1764.62	10.	39.20	2.11	2.481E-03	1764.51	15.920	PBC<MDA	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
149.04	74.72	279.	160.	0.080	50.13	1.005	BI-207	D
153.74	77.07	252.	264.	0.132	31.51	1.006	PB-214	D
257.41	128.90	261.	95.	0.048	78.43	1.130	AC-228	
419.72	210.02	133.	47.	0.023	118.17	0.997	NP-239	s
477.28	238.80	88.	471.	0.235	16.22	1.122	PB-212	D
483.17	241.75	136.	71.	0.035	78.81	1.124	PB-214	D
554.66	277.46	71.	33.	0.016	120.26	0.804	TL-208	
602.24	301.24	72.	65.	0.032	73.30	0.817	PB-212	s

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-212	148.98	74.70	621.	147.	0.073	73.50	1.499
PB-214	153.79	77.11	608.	209.	0.104	53.24	1.499D
PB-212	153.79	77.11	604.	212.	0.106	53.24	1.499D
TH-234	185.89	93.16	465.	77.	0.038	107.88	1.499s
TH-234	185.88	93.15	435.	84.	0.042	102.75	1.499s
RA-226	372.15	186.25	248.	90.	0.045	80.42	1.499s
PB-212	477.30	238.80	211.	398.	0.199	21.16	1.499
PB-214	590.53	295.39	107.	99.	0.049	52.54	1.499s
AC-228	676.63	338.42	110.	121.	0.060	53.46	1.183
PB-214	703.87	352.04	81.	150.	0.075	34.68	1.499s
SB-125	925.48	462.79	37.	27.	0.013	106.63	1.499s
TL-208	1021.79	510.93	79.	76.	0.038	57.22	1.757s
TL-208	1166.34	583.16	42.	152.	0.076	32.45	1.134
BI-214	1218.70	609.33	23.	142.	0.071	30.33	1.561s
CS-137	1323.18	661.55	51.	97.	0.048	52.26	1.759s
BI-212	1455.08	727.46	29.	25.	0.012	106.83	1.499
AC-228	1822.81	911.23	10.	97.	0.048	33.97	0.873s
AC-228	1937.10	968.34	28.	93.	0.047	45.36	1.978s
BI-214	2240.71	1120.06	32.	30.	0.015	113.96	1.497s
K-40	2922.59	1460.79	9.	396.	0.198	15.59	2.036s
BI-214	3530.67	1764.62	4.	10.	0.005	117.60	2.106s

s - Peak fails shape tests.
D - Peak area deconvoluted.

A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	Peak MDA Value pCi/gm	COMMENTS
BE-7		2.8418E-01					
			477.56	2.842E-01	%(	5.980E-01 1.81E-01	G
K-40		1.8798E+01					
			1460.75	1.880E+01	@(P	7.954E-01 9.82E-01	G
MN-54		2.4229E-02					
			834.81	2.423E-02	&(P	8.679E-02 2.52E-02	G
CO-57		8.6053E-03					
			122.07	8.605E-03	&(	7.002E-02 2.07E-02	G K
			136.43	3.823E-02	&	5.910E-01 1.74E-01	G
CO-60		3.2072E-04					
			1332.51	3.207E-04	%(P	1.031E-01 2.74E-02	G K
			1173.23	1.740E-02	% P	1.242E-01 3.52E-02	G K
Sr-85		-1.1220E-02					
			514.00	-1.122E-02	%(	9.915E-02 2.88E-02	G
Kr-85		-4.1570E+02					
			513.99	-4.157E+02	%(P	2.164E+03 6.28E+02	G
Y-88		0.0000E+00					
			1836.01	0.000E+00	%(	4.824E-02 6.55E-03	G K
			898.02	2.926E-02	% P	8.179E-02 2.41E-02	G
NB-94		1.3679E-02					
			871.10	1.368E-02	%(P	5.879E-02 1.65E-02	G K
			702.50	1.901E-02	& P	6.621E-02 1.93E-02	G K
Ag-108M		0.0000E+00					
			722.95	0.000E+00	%(	1.485E-01 4.26E-02	G K
			614.37	-2.972E-02	% P	9.513E-02 2.81E-02	G
			433.93	-1.459E-02	%	7.698E-02 2.24E-02	G
CD-109		4.6198E-01					
			88.04	4.620E-01	%(P	2.130E+00 6.37E-01	G
SN-113		-1.1309E-02					
			391.71	-1.131E-02	&(	1.153E-01 3.34E-02	G K
			255.04	3.544E-01	% P	2.839E+00 8.31E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	1.1983E-01						
		427.95	-1.832E-03	%(P	2.414E-01	6.85E-02	G K
		600.77	1.246E-01	% P	2.875E-01	8.63E-02	G
		636.15	-9.521E-02	% P	6.924E-01	1.97E-01	G
		463.51	4.799E-01	*(P	5.611E-01	1.80E-01	G
		176.29	-2.089E-02	% P	7.316E-01	2.10E-01	G
I-131	-2.4218E-02						
		364.48	-2.422E-02	%(	1.396E-01	4.08E-02	G K
		636.97	-3.223E-01	%	1.746E+00	5.02E-01	G
		284.29	-2.282E-01	%	1.659E+00	4.85E-01	G
CS-134	-3.1267E-02						
		604.66	-3.127E-02	%(P	9.476E-02	2.80E-02	G K
		795.76	-1.295E-02	% P	1.148E-01	3.24E-02	G
		569.29	-6.333E-03	% P	4.282E-01	1.17E-01	G
		801.84	-1.390E-01	%	8.897E-01	2.51E-01	G
CS-137	2.8787E-01						
		661.62	2.879E-01	@(P	1.074E-01	5.06E-02	G
CE-139	1.7291E-02						
		165.85	1.729E-02	%(P	7.320E-02	2.18E-02	G
EU-152	2.5645E-02						
		121.78	2.565E-02	&(P	2.068E-01	6.13E-02	G K
		344.30	-5.425E-02	% P	2.529E-01	7.41E-02	G
		1408.08	4.860E-02	% P	4.004E-01	1.07E-01	G
		964.00	-4.580E-02	% P	1.038E+00	2.96E-01	G
		1112.07	-9.634E-03	% P	7.561E-01	2.05E-01	G
		778.90	4.374E-02	& P	5.624E-01	1.55E-01	G
EU-154	3.0709E-02						
		123.10	3.071E-02	%(P	1.492E-01	4.44E-02	G K
		1274.80	-3.503E-03	% P	2.713E-01	7.21E-02	G
		723.30	5.077E-02	% P	2.645E-01	7.33E-02	G
		1004.80	-3.415E-02	% P	4.662E-01	1.27E-01	G
EU-155	7.2055E-02						
		86.45	7.205E-02	%(	2.120E-01	6.37E-02	G K
		105.31	9.419E-02	%	2.914E-01	8.75E-02	G
HG-203	0.0000E+00						
		279.17	0.000E+00	&(	7.816E-02	2.25E-02	G K
		72.87	-7.993E-01	% P	2.155E+00	6.49E-01	G
		70.83	-2.311E-01	%	3.803E+00	1.13E+00	G
		82.50	-7.322E-01	%	4.040E+00	1.21E+00	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	3.9454E-01						
		583.14	3.945E-01	(P	8.584E-02	4.33E-02	G
		510.72	6.694E-01	+ P	3.852E-01	1.55E-01	G
PB-212	9.3545E-01						
		238.63	8.872E-01	(P	1.567E-01	6.35E-02	G K
							Energy duplication
		77.11	1.054E+00	(	5.820E-01	1.87E-01	G
		74.81	1.380E+00	& P	1.119E+00	3.50E-01	G
PB-214	5.6822E-01						
		351.99	5.538E-01	@(P	1.643E-01	6.49E-02	G K
		295.22	5.961E-01	*(P	3.067E-01	1.06E-01	G
							Energy duplication
		77.11	1.694E+00	+ P	9.547E-01	3.06E-01	G
		241.92	-3.565E-01	% P	1.220E+00	3.65E-01	G
BI-212	5.7820E-01						
		727.17	5.782E-01	(P	6.493E-01	2.12E-01	G K
		1620.56	7.460E-01	&	2.372E+00	6.76E-01	G
		785.42	1.749E+00	% P	3.331E+00	1.02E+00	G
BI-214	7.4153E-01						
		609.32	7.176E-01	*(P	1.270E-01	7.31E-02	G K
		1764.51	3.871E-01	- P	4.484E-01	1.58E-01	G
		1120.28	8.147E-01	(P	7.740E-01	3.13E-01	G
RA-224	1.3117E+00						
		241.00	1.312E+00	%(P	2.094E+00	6.41E-01	G
RA-226	2.2133E+00						
		185.99	2.213E+00	*(	1.865E+00	5.93E-01	G
AC-228	1.1807E+00						
		911.07	1.121E+00	(P	2.045E-01	1.29E-01	G K
		968.90	1.896E+00	+ P	5.538E-01	2.89E-01	G
		338.40	1.324E+00	(P	5.664E-01	2.40E-01	G
TH-227	-3.4998E-01						
		236.00	-3.500E-01	%(P	7.311E-01	2.21E-01	G K
		256.25	8.710E-02	% P	8.073E-01	2.35E-01	G
PA-234	1.3150E-01						
		98.44	1.315E-01	%(	2.497E-01	7.60E-02	G K
		946.00	-4.558E-02	%	4.263E-01	1.18E-01	G
		131.28	-5.971E-02	%	3.239E-01	9.65E-02	G
		94.67	-1.886E-01	%	4.888E-01	1.47E-01	G
		883.24	2.255E-02	&	6.844E-01	1.87E-01	G
		926.70	5.243E-03	&	6.466E-01	1.71E-01	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26 0.000E+00 %   6.280E-01 1.73E-01 G

TH-234       1.5074E+00
                           63.29 5.625E-01 %(P 3.579E+00 1.06E+00 G K
                           92.80 2.097E+00  (P 2.503E+00 7.71E-01 G
                           92.38 2.253E+00 &(P 3.024E+00 9.25E-01 G

AM-241       1.4293E-01
                           59.54 1.429E-01 %(P 4.400E-01 1.32E-01 G
   ( - This peak used in the nuclide activity average.

   * - Peak is too wide, but only one peak in library.
   ! - Peak is part of a multiplet and this area went
       negative during deconvolution.
   ? - Peak is too narrow.
   @ - Peak is too wide at FW25M, but ok at FWHM.
   % - Peak fails sensitivity test.
   $ - Peak identified, but first peak of this nuclide
       failed one or more qualification tests.
   + - Peak activity higher than counting uncertainty range.
   - - Peak activity lower than counting uncertainty range.
   = - Peak outside analysis energy range.
   & - Calculated peak centroid is not close enough to the
       library energy centroid for positive identification.
   P - Peakbackground subtraction
   } - Peak is too close to another for the activity
       to be found directly.

   Nuclide Codes:                      Peak Codes:
   T - Thermal Neutron Activation      G - Gamma Ray
   F - Fast Neutron Activation         X - X-Ray
   I - Fission Product                 P - Positron Decay
   N - Naturally Occurring Isotope     S - Single-Escape
   P - Photon Reaction                 D - Double-Escape
   C - Charged Particle Reaction       K - Key Line
   M - No MDA Calculation              A - Not in Average
   R - Coincidence Corrected           C - Coincidence Peak
   H - Halflife limit exceeded

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
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***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	2.6251E-01	2.8418E-01	5.4425E-01	5.4448E-01	5.524E-01
K-40	#	1.8798E+01	1.8798E+01	2.9472E+00	3.1328E+00	
MN-54	#A	2.3903E-02	2.4229E-02	7.5665E-02	7.5677E-02	8.562E-02
CO-57	#B	8.4713E-03	8.6053E-03	6.2205E-02	6.2207E-02	6.893E-02
CO-60	#B	3.2001E-04	3.2072E-04	8.2301E-02	8.2301E-02	1.029E-01

Sr-85	#A	-1.0511E-02	-1.1220E-02	8.6270E-02	8.6273E-02	9.288E-02
Kr-85	#A	-4.1568E+02	-4.1570E+02	2.4495E+03	2.4496E+03	2.164E+03
Y-88	#B	0.0000E+00	0.0000E+00	1.9638E-02	1.9642E-02	4.637E-02
NB-94	#B	1.3678E-02	1.3679E-02	4.9599E-02	4.9605E-02	5.879E-02
Ag-108M	#B	0.0000E+00	0.0000E+00	1.2780E-01	1.2780E-01	1.485E-01
CD-109	#A	4.5768E-01	4.6198E-01	1.9102E+00	1.9103E+00	2.110E+00
SN-113	#B	-1.0901E-02	-1.1309E-02	1.0019E-01	1.0019E-01	1.112E-01
SB-125	#B	1.1933E-01	1.1983E-01	1.3470E-01	1.3487E-01	2.404E-01
I-131	#B	-1.4301E-02	-2.4218E-02	1.2248E-01	1.2249E-01	8.244E-02
CS-134	#B	-3.1092E-02	-3.1267E-02	9.2205E-02	9.2222E-02	9.423E-02
CS-137	#	2.8776E-01	2.8787E-01	1.5183E-01	1.5270E-01	
CE-139	#A	1.6766E-02	1.7291E-02	6.5383E-02	6.5390E-02	7.098E-02
EU-152	#B	2.5622E-02	2.5645E-02	1.8376E-01	1.8377E-01	2.067E-01
EU-154	#B	3.0667E-02	3.0709E-02	1.3325E-01	1.3326E-01	1.490E-01
EU-155	#B	7.1886E-02	7.2055E-02	1.9124E-01	1.9128E-01	2.115E-01
HG-203	#B	0.0000E+00	0.0000E+00	6.7516E-02	6.7516E-02	7.137E-02
TL-208		3.9454E-01	3.9454E-01	1.3002E-01	1.3192E-01	
PB-212	#	9.3545E-01	9.3545E-01	2.0096E-01	2.0780E-01	1.567E-01
PB-214	#	5.6822E-01	5.6822E-01	1.8182E-01	1.8463E-01	1.643E-01
BI-212	#A	5.7820E-01	5.7820E-01	6.3455E-01	6.3539E-01	6.493E-01
BI-214	#	7.4153E-01	7.4153E-01	2.2666E-01	2.3050E-01	
RA-224	#A	1.3117E+00	1.3117E+00	1.9218E+00	1.9232E+00	2.094E+00
RA-226	#	2.2133E+00	2.2133E+00	1.7800E+00	1.7844E+00	1.865E+00
AC-228		1.1807E+00	1.1807E+00	3.8081E-01	3.8661E-01	
TH-227	#B	-3.4998E-01	-3.4998E-01	6.7870E-01	6.7899E-01	7.311E-01
PA-234	#B	1.3150E-01	1.3150E-01	2.2786E-01	2.2798E-01	2.497E-01
TH-234	#B	1.5074E+00	1.5074E+00	1.6632E+00	1.6653E+00	3.579E+00
AM-241	#A	1.4292E-01	1.4293E-01	3.9636E-01	3.9644E-01	4.400E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (270.1 to 1999.1 keV) 2.1402550E+01 pCi/gm
Total Decayed Activity (270.1 to 1999.1 keV) 2.1402660E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JPK

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 101f_7SEPT2006_1113.An1

Sample description
FSS-OOL-05-03-003-F-RC

Spectrum Filename: C:\GammaVision\Spectra\101f_7SEPT2006_1113.An1

Acquisition information

Start time:	07-Sep-2006 11:13:48
Live time:	2000
Real time:	2001
Dead time:	0.07 %
Detector ID:	1

Detector system
Det 101- DSPE-633

Calibration

Filename:	D1_1LSa.Clb

Detector 101 1.0 Liter Marinelli Sand

Energy Calibration

Created:	03-Sep-2004 08:50:48
Zero offset:	0.244 keV
Gain:	0.500 keV/channel
Quadratic:	-2.493E-08 keV/channel^2

Efficiency Calibration

Created:	03-Sep-2004 08:52:26
Type:	Polynomial
Uncertainty:	0.626 %
Coefficients:	-0.321775 -5.816463 0.734234
	-0.099357 0.006049 -0.000149

Library Files

Main analysis library:	FSS_Rev_1.Lib
Library Match Width:	1.000
Peak stripping:	Library based

Analysis parameters

Analysis engine:	Env32 G53W4.20
Start channel:	100 (50.23keV)
Stop channel:	4000 (1999.11keV)
Peak rejection level:	41.667%
Peak search sensitivity:	3
Sample Size:	9.0400E+02
Activity scaling factor:	1.0000E+06/(1.0000E+00* 9.0400E+02) = 1.1062E+03
Detection limit method:	Nureg 4.16
Random error:	1.0000000E+00
Systematic error:	1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	01-Sep-2006 07:55:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	101_150K_28APR05.Pbc 01-May-2005 05:24:47
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 15 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.1274

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
74.79	123.	28.45	1.50	1.654E-02				
74.79	123.	28.45	1.50	1.654E-02	74.81	9.600	1.160E+00	PB212
77.16	261.	13.71	1.50	1.720E-02	77.11	17.500	1.296E+00	PB212
					77.11	10.700	2.090E+00	PB214
77.16	257.	13.71	1.50	1.720E-02	77.11	17.500	1.278E+00	PB212
					77.11	10.700	2.090E+00	PB214
93.08	85.	25.21	1.02	1.990E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
99.34	46.	39.80	0.85	2.046E-02				
186.21	74.	23.89	0.79	1.857E-02	185.99	3.280	1.812E+00	RA226
238.80	485.	5.25	1.12	1.557E-02	238.63	43.100	1.066E+00	PB212
270.26	32.	40.22	1.00	1.400E-02				
295.30	92.	18.04	1.04	1.292E-02	295.22	19.200	5.461E-01	PB214
338.46	98.	20.66	1.32	1.135E-02	338.40	12.010	1.051E+00	AC228
352.05	203.	11.15	1.36	1.092E-02	351.99	37.100	7.421E-01	PB214
464.00	45.	30.04	1.26	8.333E-03	463.51	10.000	7.838E-01	SB125
510.60	77.	14.98	0.98	7.592E-03	510.72	22.500	5.363E-01	TL208
583.27	124.	13.01	1.07	6.683E-03	583.14	86.000	3.176E-01	TL208
609.38	142.	10.76	1.22	6.412E-03	609.32	46.090	7.106E-01	BI214
661.77	82.	18.10	1.78	5.936E-03	661.62	84.620	2.402E-01	CS137
727.31	26.	40.07	1.50	5.443E-03	727.17	11.800	PBC<MDA	BI212
911.42	106.	13.96	1.51	4.445E-03	911.07	29.000	1.212E+00	AC228
968.91	69.	20.97	1.53	4.212E-03	968.90	17.460	1.380E+00	AC228
1120.75	38.	34.54	1.02	3.709E-03	1120.28	15.040	9.969E-01	BI214
1460.88	335.	5.54	1.54	2.942E-03	1460.75	10.700	1.582E+01	K40
1764.30	9.	33.78	2.11	2.481E-03	1764.51	15.920	3.462E-01	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
198.27	99.34	142.	53.	0.026	104.78	0.846	AC-228	
477.30	238.80	81.	485.	0.242	15.75	1.122	PB-212	D
540.25	270.26	68.	32.	0.016	120.67	1.000	AC-228	

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-212	149.14	74.79	609.	123.	0.062	85.35	1.499s
PB-212	153.79	77.11	510.	261.	0.131	41.12	1.499D
PB-214	153.79	77.11	513.	257.	0.129	41.12	1.499D
TH-234	184.46	92.44	454.	76.	0.038	107.48	1.499
TH-234	185.66	93.04	418.	104.	0.052	83.44	1.499
RA-226	372.03	186.19	238.	76.	0.038	93.17	1.499
PB-212	477.23	238.77	237.	360.	0.180	23.57	1.499
PB-214	590.57	295.41	107.	83.	0.041	60.97	1.499
AC-228	676.71	338.46	106.	96.	0.048	61.99	1.319
PB-214	703.93	352.07	69.	172.	0.086	30.25	1.499s
TL-208	1021.14	510.60	41.	61.	0.031	44.94	0.984s
TL-208	1166.55	583.27	50.	122.	0.061	39.02	1.068
BI-214	1218.80	609.38	34.	140.	0.070	32.29	1.223s
CS-137	1323.63	661.77	42.	81.	0.040	54.31	1.780s
BI-212	1454.77	727.31	46.	26.	0.013	120.20	1.499s
AC-228	1823.19	911.42	35.	105.	0.052	41.88	1.509
AC-228	1938.24	968.91	37.	68.	0.034	62.91	1.533
BI-214	2242.10	1120.75	37.	37.	0.019	103.61	1.022s
K-40	2922.79	1460.88	5.	333.	0.167	16.61	1.544s
BI-214	3530.03	1764.30	1.	9.	0.005	101.33	2.106s

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	MDA Value pCi/gm	COMMENTS
BE-7		5.5630E-02					
			477.56	5.563E-02	%(	6.137E-01 1.73E-01	G
K-40		1.5816E+01					
			1460.75	1.582E+01	@(P	6.174E-01 8.82E-01	G
MN-54		5.0797E-02					
			834.81	5.080E-02	%(P	7.348E-02 2.33E-02	G
CO-57		-1.0127E-02					
			122.07	-1.013E-02	&(	7.235E-02 2.15E-02	G K
			136.43	-8.689E-02	%	5.983E-01 1.78E-01	G
CO-60		2.7972E-03					
			1332.51	2.797E-03	&(P	1.032E-01 2.76E-02	G K
			1173.23	2.475E-02	& P	1.146E-01 3.29E-02	G K
Sr-85		-4.5044E-02					
			514.00	-4.504E-02	%(	1.067E-01 3.22E-02	G
Kr-85		-1.0281E+03					
			513.99	-1.028E+03	%(P	2.319E+03 6.95E+02	G
Y-88		0.0000E+00					
			1836.01	0.000E+00	%(	1.085E-01 2.76E-02	G K
			898.02	4.601E-03	& P	1.008E-01 2.78E-02	G
NB-94		2.2224E-02					
			871.10	2.222E-02	%(P	6.476E-02 1.90E-02	G K
			702.50	-1.565E-02	& P	8.330E-02 2.40E-02	G K
Ag-108M		-1.2238E-02					
			722.95	-1.224E-02	%(	1.092E-01 3.13E-02	G K
			614.37	-8.688E-03	% P	8.236E-02 2.33E-02	G
			433.93	0.000E+00	%	7.689E-02 2.18E-02	G
CD-109		1.1036E+00					
			88.04	1.104E+00	&(P	2.056E+00 6.25E-01	G
SN-113		-1.6790E-02					
			391.71	-1.679E-02	%(	1.048E-01 3.05E-02	G K
			255.04	4.862E-02	& P	2.764E+00 7.98E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	-8.0486E-03						
		427.95	-8.049E-03	%(P	1.933E-01	5.42E-02	G K
		600.77	-2.198E-02	& P	3.530E-01	9.77E-02	G
		636.15	6.842E-02	% P	5.355E-01	1.49E-01	G
		463.51	5.115E-01	% P	6.877E-01	2.15E-01	G
		176.29	1.462E-01	& P	9.799E-01	2.90E-01	G
I-131	-2.4748E-02						
		364.48	-2.475E-02	%(	1.274E-01	3.72E-02	G K
		636.97	2.966E-01	%	1.510E+00	4.32E-01	G
		284.29	3.665E-02	&	1.755E+00	5.08E-01	G
CS-134	-2.2705E-03						
		604.66	-2.271E-03	%(P	9.678E-02	2.73E-02	G K
		795.76	3.094E-02	% P	8.632E-02	2.54E-02	G
		569.29	-5.324E-02	% P	4.804E-01	1.36E-01	G
		801.84	7.974E-02	%	8.401E-01	2.33E-01	G
CS-137	2.4024E-01						
		661.62	2.402E-01	(P	9.826E-02	4.40E-02	G
CE-139	6.3068E-03						
		165.85	6.307E-03	&(P	7.635E-02	2.25E-02	G
EU-152	-6.6920E-03						
		121.78	-6.692E-03	&(P	1.877E-01	5.50E-02	G K
		344.30	9.038E-02	% P	2.229E-01	6.69E-02	G
		1408.08	5.221E-02	% P	3.468E-01	9.24E-02	G
		964.00	2.402E-01	% P	7.308E-01	2.15E-01	G
		1112.07	-6.600E-03	& P	8.604E-01	2.37E-01	G
		778.90	5.544E-02	% P	5.721E-01	1.59E-01	G
EU-154	5.0927E-03						
		123.10	5.093E-03	&(P	1.407E-01	4.13E-02	G K
		1274.80	-3.514E-02	% P	2.976E-01	8.25E-02	G
		723.30	-7.380E-02	% P	5.147E-01	1.48E-01	G
		1004.80	4.185E-02	% P	4.394E-01	1.20E-01	G
EU-155	5.3751E-02						
		86.45	5.375E-02	%(	2.242E-01	6.70E-02	G K
		105.31	3.932E-02	%	2.815E-01	8.35E-02	G
HG-203	-5.6146E-03						
		279.17	-5.615E-03	%(	8.313E-02	2.42E-02	G K
		72.87	-1.155E+00	% P	2.078E+00	6.31E-01	G
		70.83	-3.662E-01	%	2.232E+00	6.61E-01	G
		82.50	-1.138E+00	%	4.479E+00	1.34E+00	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	3.1757E-01						
		583.14	3.176E-01	(P	9.263E-02	4.21E-02	G
		510.72	5.363E-01	+ P	2.840E-01	1.01E-01	G
PB-212	8.0122E-01						
		238.63	8.012E-01	(P	1.657E-01	6.40E-02	G K
							Energy duplication
		77.11	1.296E+00	+	5.358E-01	1.78E-01	G
		74.81	1.160E+00	+ P	1.108E+00	3.44E-01	G
PB-214	6.3415E-01						
		351.99	6.342E-01	@(P	1.526E-01	6.47E-02	G K
		295.22	4.982E-01	- P	3.066E-01	1.03E-01	G
							Energy duplication
		77.11	2.090E+00	+ P	8.795E-01	2.91E-01	G
		241.92	-1.342E-01	% P	1.058E+00	3.13E-01	G
BI-212	6.1262E-01						
		727.17	6.126E-01	*(P	7.962E-01	2.52E-01	G K
		1620.56	5.230E-01	%	2.648E+00	7.15E-01	G
		785.42	6.597E-01	& P	3.754E+00	1.06E+00	G
BI-214	7.1057E-01						
		609.32	7.106E-01	@(P	1.501E-01	7.71E-02	G K
		1764.51	3.462E-01	- P	2.789E-01	1.23E-01	G
		1120.28	9.969E-01	+ P	8.296E-01	3.48E-01	G
RA-224	1.4130E+00						
		241.00	1.413E+00	%(P	2.013E+00	6.19E-01	G
RA-226	1.8557E+00						
		185.99	1.856E+00	(	1.831E+00	5.76E-01	G
AC-228	1.2289E+00						
		911.07	1.212E+00	(P	3.531E-01	1.72E-01	G K
		968.90	1.380E+00	(P	6.322E-01	2.92E-01	G
		338.40	1.051E+00	(P	5.563E-01	2.22E-01	G
TH-227	-7.0707E-02						
		236.00	-7.071E-02	%(P	6.425E-01	1.89E-01	G K
		256.25	3.196E-02	% P	7.415E-01	2.13E-01	G
PA-234	-7.4776E-02						
		98.44	-7.478E-02	%(	2.566E-01	7.69E-02	G K
		946.00	-7.005E-02	%	5.016E-01	1.42E-01	G
		131.28	4.318E-02	&	2.961E-01	8.78E-02	G
		94.67	-7.485E-02	&	4.877E-01	1.45E-01	G
		883.24	5.369E-04	%	6.146E-01	1.64E-01	G
		926.70	1.244E-01	%	7.100E-01	2.00E-01	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26-6.908E-02 %   7.053E-01 2.00E-01 G

TH-234       1.8320E+00
                           63.29 9.779E-01 %(P 3.459E+00 1.03E+00 G K
                           92.80 2.598E+00  (P 2.456E+00 7.66E-01 G
                           92.38 2.234E+00  (P 2.989E+00 9.14E-01 G

AM-241       2.9044E-02
                           59.54 2.904E-02 %(P 4.571E-01 1.35E-01 G
   ( - This peak used in the nuclide activity average.

   * - Peak is too wide, but only one peak in library.
   ! - Peak is part of a multiplet and this area went
       negative during deconvolution.
   ? - Peak is too narrow.
   @ - Peak is too wide at FW25M, but ok at FWHM.
   % - Peak fails sensitivity test.
   $ - Peak identified, but first peak of this nuclide
       failed one or more qualification tests.
   + - Peak activity higher than counting uncertainty range.
   - - Peak activity lower than counting uncertainty range.
   = - Peak outside analysis energy range.
   & - Calculated peak centroid is not close enough to the
       library energy centroid for positive identification.
   P - Peakbackground subtraction
   } - Peak is too close to another for the activity
       to be found directly.

   Nuclide Codes:                      Peak Codes:
   T - Thermal Neutron Activation      G - Gamma Ray
   F - Fast Neutron Activation         X - X-Ray
   I - Fission Product                 P - Positron Decay
   N - Naturally Occurring Isotope     S - Single-Escape
   P - Photon Reaction                 D - Double-Escape
   C - Charged Particle Reaction       K - Key Line
   M - No MDA Calculation              A - Not in Average
   R - Coincidence Corrected           C - Coincidence Peak
   H - Halflife limit exceeded

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
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***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	5.1370E-02	5.5630E-02	5.2032E-01	5.2033E-01	5.667E-01
K-40	#	1.5816E+01	1.5816E+01	2.6448E+00	2.7917E+00	
MN-54	#A	5.0109E-02	5.0797E-02	6.9993E-02	7.0052E-02	7.248E-02
CO-57	#B	-9.9691E-03	-1.0127E-02	6.4400E-02	6.4402E-02	7.122E-02
CO-60	#B	2.7910E-03	2.7972E-03	8.2935E-02	8.2936E-02	1.029E-01

Sr-85	#A	-4.2183E-02	-4.5044E-02	9.6463E-02	9.6497E-02	9.991E-02
Kr-85	#A	-1.0280E+03	-1.0281E+03	2.3178E+03	2.3185E+03	2.319E+03
Y-88	#B	0.0000E+00	0.0000E+00	8.2652E-02	8.2653E-02	1.043E-01
NB-94	#B	2.2224E-02	2.2224E-02	5.6865E-02	5.6878E-02	6.476E-02
Ag-108M	#B	-1.2237E-02	-1.2238E-02	9.3765E-02	9.3767E-02	1.092E-01
CD-109	#A	1.0933E+00	1.1036E+00	1.8763E+00	1.8773E+00	2.037E+00
SN-113	#B	-1.6181E-02	-1.6790E-02	9.1385E-02	9.1390E-02	1.010E-01
SB-125	#B	-8.0148E-03	-8.0486E-03	2.5835E-01	2.5835E-01	1.925E-01
I-131	#B	-1.4579E-02	-2.4748E-02	1.1165E-01	1.1166E-01	7.503E-02
CS-134	#B	-2.2577E-03	-2.2705E-03	3.8550E-01	3.8550E-01	9.623E-02
CS-137		2.4015E-01	2.4024E-01	1.3191E-01	1.3260E-01	
CE-139	#A	6.1147E-03	6.3068E-03	6.7487E-02	6.7488E-02	7.402E-02
EU-152	#B	-6.6859E-03	-6.6920E-03	2.9555E-01	2.9555E-01	1.875E-01
EU-154	#B	5.0857E-03	5.0927E-03	1.2397E-01	1.2397E-01	1.405E-01
EU-155	#B	5.3625E-02	5.3751E-02	2.0113E-01	2.0115E-01	2.237E-01
HG-203	#B	-5.1246E-03	-5.6146E-03	7.2556E-02	7.2557E-02	7.588E-02
TL-208		3.1757E-01	3.1757E-01	1.2633E-01	1.2760E-01	
PB-212	#	8.0122E-01	8.0122E-01	1.9211E-01	1.9737E-01	1.657E-01
PB-214	#	6.3415E-01	6.3415E-01	1.9407E-01	1.9735E-01	1.526E-01
BI-212	#A	6.1262E-01	6.1262E-01	7.5531E-01	7.5610E-01	7.962E-01
BI-214		7.1057E-01	7.1057E-01	2.3127E-01	2.3473E-01	
RA-224	#A	1.4130E+00	1.4130E+00	1.8575E+00	1.8592E+00	2.013E+00
RA-226	#	1.8557E+00	1.8557E+00	1.7290E+00	1.7322E+00	1.831E+00
AC-228		1.2289E+00	1.2289E+00	4.0713E-01	4.1301E-01	
TH-227	#B	-7.0707E-02	-7.0707E-02	6.3080E-01	6.3081E-01	6.425E-01
PA-234	#B	-7.4776E-02	-7.4776E-02	2.3072E-01	2.3075E-01	2.566E-01
TH-234	#B	1.8320E+00	1.8320E+00	1.6196E+00	1.6228E+00	3.459E+00
AM-241	#A	2.9044E-02	2.9044E-02	4.0561E-01	4.0561E-01	4.571E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (256.1 to 1999.1 keV) 1.8313520E+01 pCi/gm
Total Decayed Activity (256.1 to 1999.1 keV) 1.8313614E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JPK

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 101F_7SEPT2006_1154.An1

Sample description
FSS-OOL-05-03-006-F

Spectrum Filename: C:\GammaVision\Spectra\101F_7SEPT2006_1154.An1

Acquisition information
Start time: 07-Sep-2006 11:54:33
Live time: 2000
Real time: 2002
Dead time: 0.08 %
Detector ID: 1

Detector system
Det 101- DSPE-633

Calibration
Filename: D1_1LSa.Clb
Detector 101 1.0 Liter Marinelli Sand

Energy Calibration
Created: 03-Sep-2004 08:50:48
Zero offset: 0.244 keV
Gain: 0.500 keV/channel
Quadratic: -2.493E-08 keV/channel^2

Efficiency Calibration
Created: 03-Sep-2004 08:52:26
Type: Polynomial
Uncertainty: 0.626 %
Coefficients: -0.321775 -5.816463 0.734234
-0.099357 0.006049 -0.000149

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.23keV)
Stop channel: 4000 (1999.11keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 1.0350E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.0350E+03) =
9.6618E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	01-Sep-2006 08:00:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	101_150K_28APR05.Pbc 01-May-2005 05:24:47
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 14 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.1058

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
74.37	151.	18.09	1.00	1.651E-02				
74.37	151.	18.09	1.00	1.651E-02	74.81	9.600	1.199E+00	PB212
77.38	278.	10.63	1.01	1.736E-02	77.11	17.500	1.204E+00	PB212
					77.11	10.700	1.942E+00	PB214
90.17	100.	22.62	1.02	1.960E-02				
93.08	128.	18.51	1.02	1.993E-02	92.38	2.570	3.005E+00	TH234
					92.80	3.000	2.671E+00	TH234
186.01	92.	28.77	1.46	1.858E-02	185.99	3.280	1.975E+00	RA226
209.46	59.	40.43	0.97	1.721E-02				
238.79	704.	4.25	1.12	1.556E-02	236.00	11.200	5.219E+00	TH227
					238.63	43.100	1.357E+00	PB212
241.47	80.	24.12	1.12	1.542E-02	241.00	3.900	PBC<MDA	RA224
					241.92	7.470	PBC<MDA	PB214
270.46	59.	32.07	1.03	1.399E-02				
295.26	104.	20.37	1.39	1.292E-02	295.22	19.200	5.380E-01	PB214
300.24	57.	29.11	1.07	1.272E-02				
338.71	109.	15.19	1.00	1.134E-02	338.40	12.010	1.019E+00	AC228
352.19	196.	11.29	1.30	1.092E-02	351.99	37.100	6.237E-01	PB214
510.96	102.	15.33	1.98	7.587E-03	510.72	22.500	6.542E-01	TL208
583.35	207.	9.60	1.40	6.682E-03	583.14	86.000	4.643E-01	TL208
609.25	130.	14.38	1.46	6.413E-03	609.32	46.090	5.703E-01	BI214
661.73	186.	9.12	1.57	5.937E-03	661.62	84.620	4.802E-01	CS137
727.44	61.	22.77	1.04	5.441E-03	727.17	11.800	1.226E+00	BI212
795.01	34.	28.73	1.06	5.020E-03				
795.01	34.	28.73	1.06	5.020E-03	795.76	85.400	1.045E-01	CS134
911.07	140.	11.57	1.34	4.447E-03	911.07	29.000	1.399E+00	AC228
964.79	35.	22.36	1.61	4.227E-03	964.00	14.580	7.399E-01	EU152

969.13	75.	12.81	1.62	4.211E-03	968.90	17.460	1.322E+00	AC228
1460.86	526.	4.50	1.85	2.942E-03	1460.75	10.700	2.171E+01	K40
1764.73	18.	23.57	0.67	2.481E-03	1764.51	15.920	5.805E-01	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
179.93	90.21	262.	68.	0.034	107.61	1.016	PB-214	D
185.74	93.11	228.	118.	0.059	61.14	1.018	U-235	D
418.60	209.46	216.	59.	0.030	121.30	0.972	AC-228	
477.28	238.83	96.	704.	0.352	12.76	1.122	PB-212	D
482.64	241.51	146.	80.	0.040	72.36	1.123	PB-214	D
540.64	270.46	130.	59.	0.030	96.21	1.032	AC-228	s
600.23	300.24	106.	57.	0.029	87.32	1.068	PB-212	
1930.60	964.92	12.	37.	0.018	63.72	1.613	AC-228	D

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-212	149.14	74.79	769.	154.	0.077	77.55	1.499
PB-212	153.79	77.11	680.	245.	0.123	49.06	1.499D
PB-214	153.79	77.11	684.	241.	0.121	49.06	1.499D
TH-234	185.81	93.12	518.	142.	0.071	67.12	1.499
TH-234	185.77	93.09	493.	147.	0.074	65.70	1.499
RA-226	371.77	186.06	299.	97.	0.048	81.66	1.499s
TH-227	477.34	238.82	178.	522.	0.261	16.99	1.499
PB-212	477.29	238.79	219.	533.	0.266	17.29	1.499
RA-224	483.04	241.67	310.	63.	0.032	122.88	1.499
PB-214	590.75	295.50	176.	95.	0.048	65.16	1.499s
AC-228	677.21	338.71	77.	106.	0.053	45.58	1.003
PB-214	704.05	352.13	115.	169.	0.085	34.93	1.499
TL-208	1021.94	511.00	79.	62.	0.031	54.74	1.499s
TL-208	1166.56	583.28	69.	156.	0.078	32.37	1.499s
BI-214	1218.53	609.25	66.	129.	0.065	43.14	1.457
CS-137	1323.55	661.73	38.	185.	0.092	27.36	1.566
BI-212	1455.03	727.44	45.	60.	0.030	68.32	1.043
CS-134	1590.45	795.11	21.	20.	0.010	115.31	1.502
AC-228	1822.49	911.07	37.	138.	0.069	34.72	1.338s
EU-152	1930.43	965.01	32.	26.	0.013	105.96	1.612
AC-228	1938.21	968.90	10.	75.	0.037	38.76	1.616D
K-40	2922.74	1460.86	9.	524.	0.262	13.49	1.855

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
BI-214	3530.89	1764.73	0.	18.	0.009	70.71	0.666s

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	Peak MDA Value pCi/gm	Peak COMMENTS
BE-7		2.3525E-01					
			477.56	2.352E-01	&(	6.383E-01	1.91E-01 G
K-40		2.1710E+01					
			1460.75	2.171E+01	(P	7.074E-01	9.80E-01 G
MN-54		1.5995E-02					
			834.81	1.599E-02	&(P	7.136E-02	2.04E-02 G
CO-57		3.6251E-03					
			122.07	3.625E-03	%(	7.008E-02	2.07E-02 G K
			136.43	-1.179E-01	%	5.609E-01	1.67E-01 G
CO-60		1.0891E-04					
			1332.51	1.089E-04	%(P	9.829E-02	2.64E-02 G K
			1173.23	-9.445E-04	% P	9.252E-02	2.50E-02 G K
Sr-85		-2.6602E-02					
			514.00	-2.660E-02	%(	8.562E-02	2.54E-02 G
Kr-85		-6.2241E+02					
			513.99	-6.224E+02	%(P	1.863E+03	5.50E+02 G
Y-88		0.0000E+00					
			1836.01	0.000E+00	%(	4.215E-02	5.72E-03 G K
			898.02	-1.063E-02	% P	8.654E-02	2.42E-02 G
NB-94		3.5288E-03					
			871.10	3.529E-03	%(P	5.857E-02	1.57E-02 G K
			702.50	2.094E-02	% P	6.378E-02	1.88E-02 G K
Ag-108M		-2.9305E-02					
			722.95	-2.930E-02	&(	1.017E-01	3.00E-02 G K
			614.37	-1.144E-02	& P	7.500E-02	2.15E-02 G
			433.93	-2.022E-03	&	7.647E-02	2.19E-02 G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CD-109	-6.7488E-01						
		88.04	-6.749E-01	&(P	2.291E+00	6.89E-01	G
SN-113	-2.4084E-02						
		391.71	-2.408E-02	%(	1.146E-01	3.38E-02	G K
		255.04	-1.029E-01	& P	2.744E+00	7.98E-01	G
SB-125	-4.4712E-02						
		427.95	-4.471E-02	&(P	2.326E-01	6.80E-02	G K
		600.77	-3.446E-02	& P	3.978E-01	1.13E-01	G
		636.15	-1.022E-01	% P	6.155E-01	1.76E-01	G
		463.51	2.927E-01	% P	6.624E-01	1.99E-01	G
		176.29	-1.290E-01	% P	9.721E-01	2.87E-01	G
I-131	-8.8408E-04						
		364.48	-8.841E-04	&(	1.393E-01	4.02E-02	G K
		636.97	-2.354E-01	%	1.550E+00	4.43E-01	G
		284.29	3.396E-01	%	1.649E+00	4.88E-01	G
CS-134	2.8126E-02						
		604.66	-8.640E-04	%(P	8.411E-02	2.37E-02	G K
		795.76	6.126E-02	?(P	7.371E-02	2.40E-02	G
		569.29	5.454E-02	% P	4.196E-01	1.20E-01	G
		801.84	-8.741E-02	&	8.380E-01	2.35E-01	G
CS-137	4.8021E-01						
		661.62	4.802E-01	(P	8.200E-02	4.40E-02	G
CE-139	-2.6521E-04						
		165.85	-2.652E-04	%(P	7.528E-02	2.21E-02	G
EU-152	1.9438E-01						
		121.78	1.259E-02	%(P	1.888E-01	5.58E-02	G K
		344.30	8.985E-02	% P	2.169E-01	6.52E-02	G
		1408.08	-2.161E-02	& P	3.514E-01	9.12E-02	G
		964.00	5.589E-01	&(P	6.158E-01	2.01E-01	G
		1112.07	9.361E-02	& P	7.162E-01	2.02E-01	G
		778.90	-6.029E-02	& P	5.688E-01	1.60E-01	G
EU-154	-1.4151E-02						
		123.10	-1.415E-02	%(P	1.569E-01	4.65E-02	G K
		1274.80	-2.044E-02	& P	3.333E-01	9.32E-02	G
		723.30	8.504E-03	% P	8.242E-01	2.40E-01	G
		1004.80	-1.269E-01	% P	5.801E-01	1.68E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
EU-155	1.3000E-01						
		86.45	1.300E-01	%(	2.541E-01	7.72E-02	G K
		105.31	-6.047E-02	&	2.809E-01	8.39E-02	G
HG-203	-1.1389E-02						
		279.17	-1.139E-02	%(	8.674E-02	2.56E-02	G K
		72.87	-1.044E-01	% P	1.732E+00	5.14E-01	G
		70.83	-1.371E+00	%	3.691E+00	1.11E+00	G
		82.50	-1.370E+00	%	4.277E+00	1.29E+00	G
TL-208	3.5346E-01						
		583.14	3.535E-01	@(P	9.388E-02	3.87E-02	G
		510.72	4.778E-01	+ P	3.382E-01	1.10E-01	G
PB-212	1.0439E+00						
		238.63	1.036E+00	(P	1.393E-01	6.04E-02	G K
							Energy duplication
		77.11	1.063E+00	(	5.388E-01	1.74E-01	G
		74.81	1.263E+00	& P	1.085E+00	3.38E-01	G
PB-214	5.3035E-01						
		351.99	5.451E-01	(P	1.697E-01	6.42E-02	G K
		295.22	5.018E-01	*(P	3.394E-01	1.11E-01	G
							Energy duplication
		77.11	1.712E+00	+ P	8.836E-01	2.84E-01	G
		241.92	-2.018E-02	% P	1.150E+00	3.40E-01	G
BI-212	1.2263E+00						
		727.17	1.226E+00	(P	6.883E-01	2.83E-01	G K
		1620.56	5.664E-01	&	2.457E+00	6.78E-01	G
		785.42	2.040E-01	% P	3.649E+00	1.01E+00	G
BI-214	5.7289E-01						
		609.32	5.703E-01	(P	1.791E-01	8.27E-02	G K
		1764.51	5.805E-01	(P	2.436E-01	1.40E-01	G
		1120.28	4.165E-01	% P	6.769E-01	2.10E-01	G
RA-224	1.3669E+00						
		241.00	1.367E+00	(P	1.837E+00	5.66E-01	G
RA-226	2.0751E+00						
		185.99	2.075E+00	*(	1.785E+00	5.65E-01	G
AC-228	1.3706E+00						
		911.07	1.399E+00	*(P	3.139E-01	1.64E-01	G K
		968.90	1.324E+00	(P	3.147E-01	1.73E-01	G
		338.40	1.019E+00	- P	4.166E-01	1.58E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TH-227	3.8752E+00						
		236.00	3.875E+00	?(P	4.807E-01	2.20E-01	G K
		256.25	3.418E-01	% P	8.193E-01	2.47E-01	G
PA-234	-2.5639E-02						
		98.44	-2.564E-02	&(	2.583E-01	7.67E-02	G K
		946.00	0.000E+00	%	4.265E-01	1.17E-01	G
		131.28	3.300E-03	&	3.115E-01	9.20E-02	G
		94.67	-2.156E-01	%	5.043E-01	1.53E-01	G
		883.24	1.025E-03	&	5.651E-01	1.52E-01	G
		926.70	0.000E+00	%	1.027E+00	2.89E-01	G
		569.26	8.862E-02	%	6.161E-01	1.77E-01	G
TH-234	2.3081E+00						
		63.29	7.350E-01	%(P	3.341E+00	9.97E-01	G K
		92.80	3.220E+00	&(P	2.324E+00	7.35E-01	G
		92.38	3.631E+00	&(P	2.785E+00	8.75E-01	G
AM-241	-1.5892E-02						
		59.54	-1.589E-02	&(P	4.356E-01	1.29E-01	G

(- This peak used in the nuclide activity average.

* - Peak is too wide, but only one peak in library.
! - Peak is part of a multiplet and this area went negative during deconvolution.
? - Peak is too narrow.
@ - Peak is too wide at FW25M, but ok at FWHM.
% - Peak fails sensitivity test.
$ - Peak identified, but first peak of this nuclide failed one or more qualification tests.
+ - Peak activity higher than counting uncertainty range.
- - Peak activity lower than counting uncertainty range.
= - Peak outside analysis energy range.
& - Calculated peak centroid is not close enough to the library energy centroid for positive identification.
P - Peakbackground subtraction
} - Peak is too close to another for the activity to be found directly.

Nuclide Codes:	Peak Codes:
T - Thermal Neutron Activation	G - Gamma Ray
F - Fast Neutron Activation	X - X-Ray
I - Fission Product	P - Positron Decay
N - Naturally Occurring Isotope	S - Single-Escape
P - Photon Reaction	D - Double-Escape
C - Charged Particle Reaction	K - Key Line
M - No MDA Calculation	A - Not in Average

R - Coincidence Corrected C - Coincidence Peak
H - Halflife limit exceeded

- -

***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	2.1716E-01	2.3525E-01	5.7164E-01	5.7180E-01	5.893E-01
K-40		2.1710E+01	2.1710E+01	2.9412E+00	3.1868E+00	
MN-54	#A	1.5778E-02	1.5995E-02	6.1252E-02	6.1259E-02	7.039E-02
CO-57	#B	3.5682E-03	3.6251E-03	6.2190E-02	6.2190E-02	6.898E-02
CO-60	#B	1.0867E-04	1.0891E-04	7.9310E-02	7.9310E-02	9.808E-02
Sr-85	#A	-2.4906E-02	-2.6602E-02	7.6339E-02	7.6354E-02	8.017E-02
Kr-85	#A	-6.2238E+02	-6.2241E+02	1.9218E+03	1.9222E+03	1.863E+03
Y-88	#B	0.0000E+00	0.0000E+00	1.7158E-02	1.7161E-02	4.050E-02
NB-94	#B	3.5288E-03	3.5288E-03	4.7218E-02	4.7218E-02	5.857E-02
Ag-108M	#B	-2.9302E-02	-2.9305E-02	9.0076E-02	9.0091E-02	1.017E-01
CD-109	#A	-6.6855E-01	-6.7488E-01	2.1195E+00	2.1199E+00	2.270E+00
SN-113	#B	-2.3206E-02	-2.4084E-02	1.0134E-01	1.0135E-01	1.104E-01
SB-125	#B	-4.4524E-02	-4.4712E-02	2.1915E-01	2.1916E-01	2.316E-01
I-131	#B	-5.1969E-04	-8.8408E-04	1.2056E-01	1.2056E-01	8.191E-02
CS-134	#B	2.7966E-02	2.8126E-02	3.3110E-02	3.3148E-02	8.363E-02
CS-137		4.8002E-01	4.8021E-01	1.3203E-01	1.3479E-01	
CE-139	#A	-2.5710E-04	-2.6521E-04	2.5224E+00	2.5224E+00	7.298E-02
EU-152	#F	1.9420E-01	1.9438E-01	2.0957E-01	2.0985E-01	1.886E-01
EU-154	#B	-1.4132E-02	-1.4151E-02	1.7014E-01	1.7014E-01	1.567E-01
EU-155	#B	1.2970E-01	1.3000E-01	2.3152E-01	2.3163E-01	2.535E-01
HG-203	#B	-1.0391E-02	-1.1389E-02	7.6655E-02	7.6658E-02	7.914E-02
TL-208	#	3.5346E-01	3.5346E-01	1.1616E-01	1.1786E-01	9.388E-02
PB-212	#	1.0439E+00	1.0439E+00	1.8252E-01	1.9181E-01	1.393E-01
PB-214	#	5.3035E-01	5.3035E-01	1.8740E-01	1.8978E-01	1.697E-01
BI-212		1.2263E+00	1.2263E+00	8.4725E-01	8.5008E-01	
BI-214		5.7289E-01	5.7289E-01	2.4213E-01	2.4429E-01	
RA-224	#A	1.3669E+00	1.3669E+00	1.6986E+00	1.7004E+00	1.837E+00
RA-226	#	2.0751E+00	2.0751E+00	1.6946E+00	1.6986E+00	1.785E+00
AC-228		1.3706E+00	1.3706E+00	3.6064E-01	3.6886E-01	
TH-227	#	3.8752E+00	3.8752E+00	6.5903E-01	6.9446E-01	4.807E-01
PA-234	#B	-2.5639E-02	-2.5639E-02	2.3014E-01	2.3014E-01	2.583E-01
TH-234	#B	2.3081E+00	2.3081E+00	1.5800E+00	1.5852E+00	3.341E+00
AM-241	#A	-1.5891E-02	-1.5892E-02	6.2412E-01	6.2412E-01	4.356E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.

H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (1120.2 to 1999.1 keV) 2.5360170E+01 pCi/gm
Total Decayed Activity (1120.2 to 1999.1 keV) 2.5360357E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JPK

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 101F_8SEP2006_0856.An1

Sample description
FSS-OOL-05-03-002-F

Spectrum Filename: C:\GammaVision\Spectra\101F_8SEP2006_0856.An1

Acquisition information
Start time: 08-Sep-2006 08:56:26
Live time: 2000
Real time: 2002
Dead time: 0.11 %
Detector ID: 1

Detector system
Det 101- DSPE-633

Calibration
Filename: D1_1LSa.Clb
Detector 101 1.0 Liter Marinelli Sand

Energy Calibration
Created: 03-Sep-2004 08:50:48
Zero offset: 0.244 keV
Gain: 0.500 keV/channel
Quadratic: -2.493E-08 keV/channel^2

Efficiency Calibration
Created: 03-Sep-2004 08:52:26
Type: Polynomial
Uncertainty: 0.626 %
Coefficients: -0.321775 -5.816463 0.734234
-0.099357 0.006049 -0.000149

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.23keV)
Stop channel: 4000 (1999.11keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 1.2560E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.2560E+03) =
7.9618E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	01-Sep-2006 07:20:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	101_150K_28APR05.Pbc 01-May-2005 05:24:47
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 10 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.1705

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
74.76	146.	27.04	1.50	1.654E-02	70.83	3.520	3.282E+00	HG203
					74.81	9.600	9.905E-01	PB212
74.87	130.	25.31	1.50	1.512E-02	74.81	9.600	PBC<MDA	PB212
77.01	223.	17.85	1.50	1.720E-02	77.11	10.700	1.302E+00	PB214
					77.11	17.500	7.964E-01	PB212
77.01	227.	17.85	1.50	1.720E-02	77.11	10.700	1.302E+00	PB214
					77.11	17.500	8.096E-01	PB212
83.95	107.	17.60	0.50	1.869E-02				
86.91	113.	21.07	1.01	1.918E-02	86.45	32.740	1.957E-01	EU155
89.98	89.	24.90	1.02	1.959E-02				
93.37	107.	22.66	1.02	1.996E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
185.99	142.	19.20	1.67	1.858E-02	185.99	3.280	2.498E+00	RA226
209.28	58.	40.62	1.01	1.722E-02				
238.68	612.	4.62	1.12	1.557E-02	238.63	43.100	9.705E-01	PB212
241.77	80.	24.06	1.12	1.541E-02	241.00	3.900	PBC<MDA	RA224
269.78	71.	30.02	1.83	1.402E-02				
295.35	144.	11.57	1.16	1.292E-02	295.22	19.200	6.188E-01	PB214
300.09	43.	29.20	1.16	1.273E-02				
338.57	114.	20.32	1.21	1.134E-02	338.40	12.010	8.826E-01	AC228
351.93	199.	11.88	1.21	1.093E-02				
351.93	199.	11.88	1.21	1.093E-02	351.99	37.100	5.230E-01	PB214
462.54	35.	29.96	0.98	8.359E-03				
462.54	35.	29.96	0.98	8.359E-03	463.51	10.000	4.323E-01	SB125
510.39	101.	19.62	1.28	7.595E-03	510.72	22.500	5.334E-01	TL208
583.06	191.	8.87	1.20	6.685E-03	583.14	86.000	3.536E-01	TL208
609.25	150.	13.65	1.47	6.413E-03	609.32	46.090	5.424E-01	BI214

661.75	31.	38.03	1.54	5.936E-03	661.62	84.620	6.452E-02	CS137
727.42	29.	33.82	0.64	5.441E-03	727.17	11.800	4.745E-01	BI212
794.60	27.	29.81	1.50	5.016E-03	795.76	85.400	6.715E-02	CS134
860.19	47.	28.66	1.04	4.679E-03				
911.29	112.	10.64	1.75	4.446E-03	911.07	29.000	9.206E-01	AC228
968.13	99.	14.71	1.06	4.215E-03				
968.13	99.	14.71	1.06	4.215E-03	968.90	17.460	1.435E+00	AC228
1118.93	55.	31.12	2.03	3.711E-03	1120.28	15.040	1.061E+00	BI214

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
1460.31	450.	4.71	2.09	2.943E-03	1460.75	10.700	1.530E+01	K40
1620.05	9.	39.30	0.96	2.682E-03	1620.56	2.750	1.269E+00	BI212
1763.97	30.	18.26	0.73	2.481E-03	1764.51	15.920	8.052E-01	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
173.41	87.02	229.	113.	0.057	63.20	1.014	PB-214	lD
179.55	90.09	201.	89.	0.044	74.69	1.016	PB-214	lD
418.23	209.28	202.	58.	0.029	121.87	1.011	AC-228	
477.06	238.70	93.	612.	0.306	13.85	1.122	PB-212	D
483.25	241.80	143.	80.	0.040	72.19	1.124	PB-214	D
539.29	269.78	143.	71.	0.036	90.05	1.832	AC-228	s
599.93	300.05	59.	43.	0.022	87.60	1.165	PB-212	lD
1720.67	860.19	32.	47.	0.023	67.25	1.042	TL-208	
1936.66	968.13	90.	40.	0.020	110.99	1.064	SB-124	s

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
HG-203	149.31	74.87	476.	130.	0.065	75.92	1.499s
PB-212	149.09	74.76	768.	146.	0.073	81.11	1.499
PB-214	153.79	77.11	708.	223.	0.111	53.55	1.499D
PB-212	153.79	77.11	705.	227.	0.113	53.55	1.499D
HG-203	170.83	85.63	674.	-99.	-0.049	115.40	1.499s
TH-234	185.47	92.95	584.	128.	0.064	77.45	1.499s
TH-234	185.43	92.92	553.	135.	0.068	74.43	1.499s
RA-226	371.64	185.99	283.	123.	0.062	63.92	1.499D
PB-212	477.09	238.70	273.	471.	0.236	19.99	1.499
RA-224	482.96	241.63	306.	70.	0.035	110.20	1.499
PB-214	590.36	295.31	151.	140.	0.070	44.47	1.499s
AC-228	676.85	338.53	112.	89.	0.044	58.28	1.499s
PB-214	703.65	351.93	94.	191.	0.095	30.20	1.499
SB-125	925.28	462.69	32.	42.	0.021	71.43	1.499
TL-208	1020.57	510.31	94.	82.	0.041	59.58	1.278s
TL-208	1166.13	583.06	38.	189.	0.094	26.60	1.201
BI-214	1218.53	609.25	74.	149.	0.074	40.95	1.472

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
CS-137	1322.93	661.42	33.	25.	0.013	108.08	1.499
BI-212	1455.00	727.42	29.	28.	0.014	101.46	0.641s
CS-134	1589.42	794.60	19.	27.	0.013	89.42	1.502
AC-228	1822.54	911.09	20.	95.	0.047	35.90	1.578s
AC-228	1937.98	968.78	36.	63.	0.031	54.78	1.616s
BI-214	2238.44	1118.93	58.	55.	0.028	93.37	2.034s
K-40	2921.64	1460.31	2.	448.	0.224	14.14	2.092
BI-212	3241.34	1620.05	1.	9.	0.004	117.90	0.958s
BI-214	3529.38	1763.97	0.	30.	0.015	54.77	0.729s

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Code	Peak MDA Value pCi/gm		COMMENTS
BE-7		1.8708E-01						
			477.56	1.871E-01	%(	4.961E-01	1.48E-01	G
K-40		1.5300E+01						
			1460.75	1.530E+01	(P	3.331E-01	7.25E-01	G
MN-54		-9.5042E-04						
			834.81	-9.504E-04	%(P	6.102E-02	1.65E-02	G
CO-57		1.0292E-02						
			122.07	1.029E-02	%(	6.032E-02	1.80E-02	G K
			136.43	-1.242E-02	%	4.917E-01	1.45E-01	G
CO-60		3.1279E-02						
			1332.51	3.128E-02	%(P	6.771E-02	2.05E-02	G K
			1173.23	2.367E-02	% P	8.263E-02	2.41E-02	G K
Sr-85		-2.6753E-02						
			514.00	-2.675E-02	&(	8.061E-02	2.41E-02	G
Kr-85		-6.1172E+02						
			513.99	-6.117E+02	&(P	1.734E+03	5.15E+02	G
Y-88		-9.1161E-03						
			1836.01	-9.116E-03	%(	7.912E-02	2.12E-02	G K
			898.02	2.457E-02	% P	6.184E-02	1.84E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
NB-94	7.7033E-03						
		871.10	7.703E-03	%(P	5.118E-02	1.42E-02	G K
		702.50	5.230E-04	& P	5.878E-02	1.63E-02	G K
Ag-108M	1.1911E-02						
		722.95	1.191E-02	%(	5.817E-02	1.67E-02	G K
		614.37	-4.881E-03	& P	6.793E-02	1.93E-02	G
		433.93	5.609E-04	&	4.825E-02	1.36E-02	G
CD-109	8.5987E-02						
		88.04	8.599E-02	%(P	1.425E+00	4.22E-01	G
SN-113	-1.8932E-02						
		391.71	-1.893E-02	&(	9.107E-02	2.68E-02	G K
		255.04	4.873E-02	& P	2.388E+00	6.96E-01	G
SB-125	1.2186E-01						
		427.95	-1.878E-02	&(P	1.693E-01	4.87E-02	G K
		600.77	2.159E-02	& P	2.997E-01	8.46E-02	G
		636.15	-2.183E-02	% P	4.476E-01	1.23E-01	G
		463.51	5.381E-01	(P	3.783E-01	1.33E-01	G
		176.29	-8.972E-03	& P	7.999E-01	2.35E-01	G
I-131	-1.4084E-02						
		364.48	-1.408E-02	&(	1.068E-01	3.11E-02	G K
		636.97	-6.901E-03	&	1.310E+00	3.62E-01	G
		284.29	-2.567E-01	%	1.525E+00	4.50E-01	G
CS-134	2.9797E-02						
		604.66	-2.891E-03	%(P	1.467E-01	4.31E-02	G K
		795.76	6.715E-02	(P	5.856E-02	2.03E-02	G
		569.29	-5.630E-02	% P	3.674E-01	1.05E-01	G
		801.84	-7.955E-02	%	7.095E-01	2.00E-01	G
CS-137	5.4488E-02						
		661.62	5.449E-02	(P	6.287E-02	2.03E-02	G
CE-139	1.1952E-02						
		165.85	1.195E-02	%(P	6.325E-02	1.88E-02	G
EU-152	-1.6721E-02						
		121.78	-1.672E-02	%(P	1.664E-01	4.93E-02	G K
		344.30	-9.301E-03	% P	1.877E-01	5.40E-02	G
		1408.08	2.519E-02	% P	2.703E-01	7.10E-02	G
		964.00	-9.336E-02	% P	6.329E-01	1.81E-01	G
		1112.07	-3.073E-02	% P	7.100E-01	1.99E-01	G
		778.90	1.398E-01	% P	4.367E-01	1.28E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
EU-154	2.5432E-02						
		123.10	2.543E-02	%(P	1.214E-01	3.62E-02	G K
		1274.80	-4.105E-02	% P	2.712E-01	7.72E-02	G
		723.30	-6.674E-03	% P	3.622E-01	1.01E-01	G
		1004.80	-7.252E-02	% P	4.313E-01	1.23E-01	G
EU-155	7.7945E-02						
		86.45	7.794E-02	%(	2.220E-01	6.70E-02	G K
		105.31	2.290E-02	%	2.286E-01	6.78E-02	G
HG-203	1.4260E-01						
		279.17	2.268E-02	%(	6.137E-02	1.84E-02	G K
		72.87	-4.637E-01	% P	1.776E+00	5.33E-01	G
		70.83	2.919E+00	&(	2.344E+00	7.39E-01	G
		82.50	-2.864E+00	&	3.582E+00	1.10E+00	G
TL-208	3.5359E-01						
		583.14	3.536E-01	(P	5.889E-02	3.17E-02	G
		510.72	5.164E-01	+ P	3.017E-01	1.23E-01	G
PB-212	7.7106E-01						
		238.63	7.554E-01	(P	1.278E-01	5.10E-02	G K
							Energy duplication
		77.11	8.096E-01	(	4.517E-01	1.45E-01	G
		74.81	9.905E-01	& P	8.932E-01	2.77E-01	G
PB-214	5.4019E-01						
		351.99	5.061E-01	(P	1.269E-01	5.15E-02	G K
		295.22	6.061E-01	*(P	2.602E-01	9.10E-02	G
							Energy duplication
		77.11	1.302E+00	+ P	7.407E-01	2.36E-01	G
		241.92	-3.648E-01	% P	9.236E-01	2.78E-01	G
BI-212	6.2467E-01						
		727.17	4.745E-01	(P	4.634E-01	1.64E-01	G K
		1620.56	1.269E+00	(	1.171E+00	4.99E-01	G
		785.42	3.717E-01	% P	3.144E+00	8.88E-01	G
BI-214	5.4237E-01						
		609.32	5.424E-01	(P	1.558E-01	7.46E-02	G K
		1764.51	8.052E-01	+ P	2.007E-01	1.49E-01	G
		1120.28	1.061E+00	+ P	7.363E-01	3.32E-01	G
RA-224	1.2568E+00						
		241.00	1.257E+00	(P	1.504E+00	4.66E-01	G
RA-226	2.1739E+00						
							Energy duplication
		185.99	2.174E+00	*(	1.431E+00	4.63E-01	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments

AC-228       8.0961E-01
                          911.07 7.888E-01 @(P 1.973E-01 9.62E-02 G K
                          968.90 9.200E-01  (P 4.507E-01 1.70E-01 G
                          338.40 6.994E-01 *(P 4.112E-01 1.39E-01 G

TH-227      -1.1636E-01
                          236.00-1.164E-01 %(P 5.773E-01 1.72E-01 G K
                          256.25 1.061E-01 & P 7.036E-01 2.07E-01 G

PA-234      -7.5754E-02
                           98.44-7.575E-02 %(  2.152E-01 6.48E-02 G K
                          946.00-5.061E-03 &   3.582E-01 9.87E-02 G
                          131.28 9.122E-02 &   2.205E-01 6.66E-02 G
                           94.67 4.269E-03 %   4.025E-01 1.19E-01 G
                          883.24-5.707E-02 &   5.561E-01 1.56E-01 G
                          926.70 6.395E-02 &   4.449E-01 1.23E-01 G
                          569.26-7.628E-02 %   5.393E-01 1.55E-01 G

TH-234       1.4087E+00
                           63.29-2.369E-01 %(P 2.874E+00 8.47E-01 G K
                           92.80 2.442E+00  (P 2.024E+00 6.33E-01 G
                           92.38 2.700E+00 &(P 2.432E+00 7.56E-01 G

AM-241       9.4317E-02
                           59.54 9.432E-02 %(P 3.541E-01 1.06E-01 G
   ( - This peak used in the nuclide activity average.

   * - Peak is too wide, but only one peak in library.
   ! - Peak is part of a multiplet and this area went
       negative during deconvolution.
   ? - Peak is too narrow.
   @ - Peak is too wide at FW25M, but ok at FWHM.
   % - Peak fails sensitivity test.
   $ - Peak identified, but first peak of this nuclide
       failed one or more qualification tests.
   + - Peak activity higher than counting uncertainty range.
   - - Peak activity lower than counting uncertainty range.
   = - Peak outside analysis energy range.
   & - Calculated peak centroid is not close enough to the
       library energy centroid for positive identification.
   P - Peakbackground subtraction
   } - Peak is too close to another for the activity
       to be found directly.

   Nuclide Codes:                      Peak Codes:
   T - Thermal Neutron Activation      G - Gamma Ray
   F - Fast Neutron Activation         X - X-Ray
```

I - Fission Product
N - Naturally Occurring Isotope
P - Photon Reaction
C - Charged Particle Reaction
M - No MDA Calculation
R - Coincidence Corrected
H - Halflife limit exceeded

P - Positron Decay
S - Single-Escape
D - Double-Escape
K - Key Line
A - Not in Average
C - Coincidence Peak

- -

***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	1.7068E-01	1.8708E-01	4.4442E-01	4.4454E-01	4.526E-01
K-40		1.5300E+01	1.5300E+01	2.1748E+00	2.3403E+00	
MN-54	#A	-9.3562E-04	-9.5042E-04	4.1403E-02	4.1403E-02	6.007E-02
CO-57	#B	1.0107E-02	1.0292E-02	5.3942E-02	5.3945E-02	5.923E-02
CO-60	#B	3.1200E-02	3.1279E-02	6.1519E-02	6.1545E-02	6.754E-02
Sr-85	#A	-2.4806E-02	-2.6753E-02	7.2196E-02	7.2211E-02	7.474E-02
Kr-85	#A	-6.1169E+02	-6.1172E+02	1.7561E+03	1.7564E+03	1.734E+03
Y-88	#B	-8.7067E-03	-9.1161E-03	6.3479E-02	6.3481E-02	7.557E-02
NB-94	#B	7.7033E-03	7.7033E-03	4.2708E-02	4.2710E-02	5.118E-02
Ag-108M	#B	1.1910E-02	1.1911E-02	4.9989E-02	4.9994E-02	5.817E-02
CD-109	#A	8.5063E-02	8.5987E-02	1.2646E+00	1.2646E+00	1.409E+00
SN-113	#B	-1.8143E-02	-1.8932E-02	8.0435E-02	8.0442E-02	8.728E-02
SB-125	#B	1.2127E-01	1.2186E-01	9.0073E-02	9.0335E-02	1.685E-01
I-131	#B	-7.6580E-03	-1.4084E-02	9.3156E-02	9.3160E-02	5.809E-02
CS-134	#B	2.9603E-02	2.9797E-02	2.7064E-02	2.7116E-02	1.457E-01
CS-137	#A	5.4464E-02	5.4488E-02	6.0936E-02	6.1014E-02	6.284E-02
CE-139	#A	1.1533E-02	1.1952E-02	5.6505E-02	5.6509E-02	6.104E-02
EU-152	#B	-1.6703E-02	-1.6721E-02	1.7422E-01	1.7422E-01	1.663E-01
EU-154	#B	2.5392E-02	2.5432E-02	1.0867E-01	1.0868E-01	1.212E-01
EU-155	#B	7.7734E-02	7.7945E-02	2.0089E-01	2.0093E-01	2.214E-01
HG-203	#F	1.2837E-01	1.4260E-01	1.0826E-01	1.0856E-01	5.524E-02
TL-208		3.5359E-01	3.5359E-01	9.5235E-02	9.7308E-02	
PB-212	#	7.7106E-01	7.7106E-01	1.5612E-01	1.6209E-01	1.278E-01
PB-214	#	5.4019E-01	5.4019E-01	1.4694E-01	1.5008E-01	1.269E-01
BI-212		6.2467E-01	6.2467E-01	4.9081E-01	4.9208E-01	
BI-214		5.4237E-01	5.4237E-01	2.2376E-01	2.2585E-01	
RA-224	#A	1.2568E+00	1.2568E+00	1.3990E+00	1.4008E+00	1.504E+00
RA-226	#	2.1739E+00	2.1739E+00	1.3895E+00	1.3949E+00	1.431E+00
AC-228	#	8.0961E-01	8.0961E-01	2.4102E-01	2.4532E-01	1.973E-01
TH-227	#B	-1.1636E-01	-1.1636E-01	5.4052E-01	5.4056E-01	5.773E-01
PA-234	#B	-7.5754E-02	-7.5754E-02	1.9449E-01	1.9454E-01	2.152E-01
TH-234	#B	1.4087E+00	1.4087E+00	1.0963E+00	1.0991E+00	2.874E+00
AM-241	#A	9.4315E-02	9.4317E-02	3.1830E-01	3.1834E-01	3.541E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (269.6 to 1999.1 keV) 1.6820601E+01 pCi/gm
Total Decayed Activity (269.6 to 1999.1 keV) 1.6820601E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JJM

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 101F_12SEPT2006_1603.An1

Sample description
FSS-OOL-05-03-005-F-RC

Spectrum Filename: C:\GammaVision\Spectra\101F_12SEPT2006_1603.An1

Acquisition information

Start time:	12-Sep-2006 16:03:49
Live time:	2000
Real time:	2001
Dead time:	0.07 %
Detector ID:	1

Detector system
Det 101- DSPE-633

Calibration
Filename: D1_1LSa.Clb
Detector 101 1.0 Liter Marinelli Sand

Energy Calibration

Created:	03-Sep-2004 08:50:48
Zero offset:	0.244 keV
Gain:	0.500 keV/channel
Quadratic:	-2.493E-08 keV/channel^2

Efficiency Calibration

Created:	03-Sep-2004 08:52:26
Type:	Polynomial
Uncertainty:	0.626 %
Coefficients:	-0.321775 -5.816463 0.734234
	-0.099357 0.006049 -0.000149

Library Files

Main analysis library:	FSS_Rev_1.Lib
Library Match Width:	1.000
Peak stripping:	Library based

Analysis parameters

Analysis engine:	Env32 G53W4.20
Start channel:	100 (50.23keV)
Stop channel:	4000 (1999.11keV)
Peak rejection level:	41.667%
Peak search sensitivity:	3
Sample Size:	1.6610E+03
Activity scaling factor:	1.0000E+06/(1.0000E+00* 1.6610E+03) = 6.0205E+02
Detection limit method:	Nureg 4.16
Random error:	1.0000000E+00
Systematic error:	1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	01-Sep-2006 07:00:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	101_150K_28APR05.Pbc 01-May-2005 05:24:47
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 9 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.3123

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
75.03	190.	21.10	1.50	1.654E-02	74.81	9.600	9.723E-01	PB212
77.04	263.	14.81	1.50	1.720E-02	77.11	10.700	1.163E+00	PB214
					77.11	17.500	7.108E-01	PB212
77.04	267.	14.81	1.50	1.720E-02	77.11	10.700	1.163E+00	PB214
					77.11	17.500	7.208E-01	PB212
186.20	85.	28.10	0.98	1.857E-02	185.99	3.280	1.129E+00	RA226
209.74	61.	37.81	1.30	1.719E-02				
238.91	499.	5.25	1.12	1.557E-02	238.63	43.100	5.972E-01	PB212
241.95	91.	18.45	1.12	1.540E-02	241.00	3.900	1.225E+00	RA224
295.53	120.	13.37	1.16	1.291E-02	295.22	19.200	3.865E-01	PB214
300.35	35.	34.89	1.16	1.272E-02				
338.83	132.	15.75	0.83	1.134E-02	338.40	12.010	7.778E-01	AC228
352.16	227.	9.50	1.08	1.092E-02	351.99	37.100	4.513E-01	PB214
463.19	29.	36.12	1.50	8.342E-03	463.51	10.000	PBC<MDA	SB125
511.37	69.	23.56	1.38	7.581E-03	510.72	22.500	2.524E-01	TL208
583.77	146.	11.65	1.69	6.678E-03	583.14	86.000	2.037E-01	TL208
609.46	176.	9.79	1.42	6.411E-03	609.32	46.090	4.803E-01	BI214
727.25	56.	26.22	1.54	5.442E-03	723.30	19.700	4.212E-01	EU154
					727.17	11.800	7.008E-01	BI212
769.06	33.	36.85	0.75	5.173E-03				
911.57	109.	12.86	1.63	4.444E-03	911.07	29.000	6.759E-01	AC228
1120.93	27.	29.97	0.89	3.711E-03	1120.28	15.040	3.895E-01	BI214
1461.22	495.	4.62	1.94	2.942E-03	1460.75	10.700	1.272E+01	K40
1765.20	13.	35.91	2.11	2.481E-03	1764.51	15.920	PBC<MDA	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
419.16	209.74	204.	61.	0.030	113.44	1.304	NP-239	
477.52	238.81	94.	499.	0.249	15.76	1.122	PB-212	D
483.60	241.85	97.	91.	0.046	55.36	1.124	PB-214	D
600.44	300.27	59.	35.	0.018	104.66	1.165	PB-212	lD
1538.32	769.06	40.	33.	0.017	96.30	0.747	BI-214	s

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-212	149.63	75.03	754.	190.	0.095	63.30	1.499s
PB-214	153.79	77.11	650.	263.	0.132	44.42	1.499D
PB-212	153.79	77.11	647.	267.	0.133	44.42	1.499D
RA-226	372.12	186.23	318.	91.	0.046	88.44	1.499
PB-212	477.37	238.83	318.	387.	0.194	24.32	1.499
RA-224	483.53	241.92	336.	73.	0.037	110.40	1.499s
PB-214	590.63	295.44	148.	95.	0.048	61.06	1.499
AC-228	677.04	338.63	102.	110.	0.055	47.27	1.499
PB-214	704.14	352.17	99.	204.	0.102	29.09	1.499s
SB-125	926.27	463.19	45.	29.	0.014	108.37	1.499s
TL-208	1167.27	583.63	37.	124.	0.062	33.19	1.499s
BI-214	1218.95	609.46	39.	174.	0.087	29.36	1.416s
BI-212	1455.66	727.75	35.	33.	0.016	90.41	1.499
AC-228	1823.14	911.40	33.	74.	0.037	46.63	1.578s
BI-214	2242.45	1120.93	17.	27.	0.013	89.91	0.891s
K-40	2923.46	1461.22	9.	492.	0.246	13.85	1.942
BI-214	3531.84	1765.20	5.	13.	0.006	107.72	2.106s

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	MDA Value pCi/gm	COMMENTS
BE-7		1.3963E-01					
			477.56	1.396E-01	%(	4.009E-01	1.19E-01 G
K-40		1.2722E+01					
			1460.75	1.272E+01	(P	4.248E-01	5.90E-01 G
MN-54		-5.2458E-03					
			834.81	-5.246E-03	&(P	5.148E-02	1.44E-02 G
CO-57		9.5955E-03					
			122.07	9.595E-03	%(	4.291E-02	1.28E-02 G K
			136.43	-3.681E-02	%	4.004E-01	1.19E-01 G
CO-60		1.4897E-02					
			1332.51	1.490E-02	%(P	4.290E-02	1.25E-02 G K
			1173.23	4.376E-03	% P	7.458E-02	2.10E-02 G K
Sr-85		-6.4264E-03					
			514.00	-6.426E-03	&(	5.724E-02	1.66E-02 G
Kr-85		-1.6081E+02					
			513.99	-1.608E+02	&(P	1.177E+03	3.39E+02 G
Y-88		0.0000E+00					
			1836.01	0.000E+00	%(	9.854E-02	2.69E-02 G K
			898.02	-4.553E-03	% P	5.184E-02	1.43E-02 G
NB-94		-5.4729E-03					
			871.10	-5.473E-03	%(P	3.911E-02	1.08E-02 G K
			702.50	1.355E-02	% P	4.933E-02	1.45E-02 G K
Ag-108M		5.9735E-04					
			722.95	5.974E-04	%(	4.145E-02	1.13E-02 G K
			614.37	-1.702E-02	% P	5.082E-02	1.51E-02 G
			433.93	-1.616E-03	&	4.357E-02	1.25E-02 G
CD-109		-5.2991E-03					
			88.04	-5.299E-03	%(P	1.466E+00	4.36E-01 G
SN-113		2.4858E-02					
			391.71	2.486E-02	&(	5.782E-02	1.74E-02 G K
			255.04	-7.018E-03	& P	1.980E+00	5.77E-01 G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	6.9504E-02						
		427.95	-1.755E-03	%(P	1.125E-01	3.16E-02	G K
		600.77	-6.196E-02	& P	2.323E-01	6.78E-02	G
		636.15	-1.534E-02	% P	3.506E-01	9.69E-02	G
		463.51	2.804E-01	(P	3.342E-01	1.06E-01	G
		176.29	1.230E-01	% P	5.526E-01	1.64E-01	G
I-131	9.3181E-05						
		364.48	9.318E-05	%(	1.182E-01	3.38E-02	G K
		636.97	1.607E-01	%	1.091E+00	3.04E-01	G
		284.29	-8.395E-02	%	1.670E+00	4.87E-01	G
CS-134	-2.1277E-02						
		604.66	-2.128E-02	%(P	5.488E-02	1.64E-02	G K
		795.76	5.092E-03	% P	5.528E-02	1.55E-02	G
		569.29	8.950E-03	% P	2.164E-01	5.96E-02	G
		801.84	-6.007E-02	&	5.422E-01	1.53E-01	G
CS-137	2.6095E-02						
		661.62	2.609E-02	%(P	4.855E-02	1.48E-02	G
CE-139	-1.2077E-02						
		165.85	-1.208E-02	%(P	4.276E-02	1.28E-02	G
EU-152	2.6088E-02						
		121.78	2.609E-02	%(P	1.252E-01	3.74E-02	G K
		344.30	-2.761E-02	% P	1.574E-01	4.62E-02	G
		1408.08	2.706E-02	% P	2.294E-01	6.18E-02	G
		964.00	-2.122E-02	% P	6.406E-01	1.84E-01	G
		1112.07	-4.054E-02	& P	5.223E-01	1.47E-01	G
		778.90	-5.521E-02	& P	3.606E-01	1.02E-01	G
EU-154	9.9587E-03						
		123.10	9.959E-03	&(P	9.060E-02	2.69E-02	G K
		1274.80	5.934E-02	% P	1.500E-01	4.47E-02	G
		723.30	-4.720E-03	% P	2.363E-01	6.53E-02	G
		1004.80	1.078E-01	% P	2.691E-01	8.03E-02	G
EU-155	4.1739E-03						
		86.45	4.174E-03	%(	1.717E-01	5.11E-02	G K
		105.31	2.027E-02	%	1.821E-01	5.41E-02	G
HG-203	-8.1514E-03						
		279.17	-8.151E-03	%(	5.560E-02	1.64E-02	G K
		72.87	-5.482E-01	% P	1.459E+00	4.40E-01	G
		70.83	-2.533E-02	&	2.400E+00	7.14E-01	G
		82.50	-5.713E-01	&	2.636E+00	7.89E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	1.7575E-01						
		583.14	1.758E-01	(P	4.403E-02	1.98E-02	G
		510.72	1.177E-01	% P	2.030E-01	5.94E-02	G
PB-212	4.6949E-01						
		238.63	4.695E-01	(P	1.040E-01	3.87E-02	G K
							Energy duplication
		77.11	7.208E-01	+	3.276E-01	1.07E-01	G
		74.81	9.723E-01	& P	6.697E-01	2.11E-01	G
PB-214	4.1048E-01						
		351.99	4.105E-01	@(P	9.861E-02	4.02E-02	G K
		295.22	3.117E-01	- P	1.945E-01	6.46E-02	G
							Energy duplication
		77.11	1.163E+00	+ P	5.373E-01	1.75E-01	G
		241.92	1.314E-01	% P	6.516E-01	1.94E-01	G
BI-212	4.1580E-01						
		727.17	4.158E-01	(P	3.830E-01	1.28E-01	G K
		1620.56	-1.707E-01	&	1.710E+00	4.50E-01	G
		785.42	5.015E-01	% P	2.283E+00	6.57E-01	G
BI-214	4.8032E-01						
		609.32	4.803E-01	*(P	8.706E-02	4.73E-02	G K
		1764.51	2.676E-01	- P	2.778E-01	9.93E-02	G
		1120.28	3.895E-01	- P	3.219E-01	1.18E-01	G
RA-224	9.9145E-01						
		241.00	9.914E-01	(P	1.190E+00	3.68E-01	G
RA-226	1.2208E+00						
		185.99	1.221E+00	(	1.145E+00	3.60E-01	G
AC-228	5.2027E-01						
		911.07	4.641E-01	(P	1.857E-01	7.40E-02	G K
		968.90	2.491E-01	% P	4.087E-01	1.26E-01	G
		338.40	6.560E-01	(P	2.973E-01	1.05E-01	G
TH-227	-1.0323E-01						
		236.00	-1.032E-01	&(P	4.248E-01	1.27E-01	G K
		256.25	-2.875E-03	% P	4.794E-01	1.38E-01	G
PA-234	-3.1219E-02						
		98.44	-3.122E-02	&(	1.789E-01	5.34E-02	G K
		946.00	-1.756E-02	%	2.924E-01	8.20E-02	G
		131.28	5.930E-02	&	1.840E-01	5.53E-02	G
		94.67	-8.518E-03	%	2.312E-01	6.82E-02	G
		883.24	5.243E-02	&	3.701E-01	1.04E-01	G
		926.70	-3.905E-02	%	3.835E-01	1.06E-01	G

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 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26 9.938E-03 %   3.173E-01 8.75E-02 G

TH-234       5.0051E-01
                           63.29 5.005E-01 %(P 2.163E+00 6.46E-01 G K
                           92.80 1.044E+00 % P 1.623E+00 4.95E-01 G
                           92.38-1.052E-01 & P 1.942E+00 5.72E-01 G

AM-241      -6.5744E-02
                           59.54-6.574E-02 &(P 2.946E-01 8.81E-02 G
   ( - This peak used in the nuclide activity average.

   * - Peak is too wide, but only one peak in library.
   ! - Peak is part of a multiplet and this area went
       negative during deconvolution.
   ? - Peak is too narrow.
   @ - Peak is too wide at FW25M, but ok at FWHM.
   % - Peak fails sensitivity test.
   $ - Peak identified, but first peak of this nuclide
       failed one or more qualification tests.
   + - Peak activity higher than counting uncertainty range.
   - - Peak activity lower than counting uncertainty range.
   = - Peak outside analysis energy range.
   & - Calculated peak centroid is not close enough to the
       library energy centroid for positive identification.
   P - Peakbackground subtraction
   } - Peak is too close to another for the activity
       to be found directly.

   Nuclide Codes:                      Peak Codes:
   T - Thermal Neutron Activation      G - Gamma Ray
   F - Fast Neutron Activation         X - X-Ray
   I - Fission Product                 P - Positron Decay
   N - Naturally Occurring Isotope     S - Single-Escape
   P - Photon Reaction                 D - Double-Escape
   C - Charged Particle Reaction       K - Key Line
   M - No MDA Calculation              A - Not in Average
   R - Coincidence Corrected           C - Coincidence Peak
   H - Halflife limit exceeded

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
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***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	1.2045E-01	1.3963E-01	3.5756E-01	3.5764E-01	3.459E-01
K-40		1.2722E+01	1.2722E+01	1.7703E+00	1.9107E+00	
MN-54	#A	-5.1150E-03	-5.2458E-03	5.6993E-02	5.6994E-02	5.019E-02
CO-57	#B	9.3192E-03	9.5955E-03	3.8446E-02	3.8450E-02	4.167E-02
CO-60	#B	1.4836E-02	1.4897E-02	3.7551E-02	3.7560E-02	4.272E-02

Sr-85	#A	-5.6904E-03	-6.4264E-03	4.9799E-02	4.9801E-02	5.068E-02
Kr-85	#A	-1.6080E+02	-1.6081E+02	1.4756E+03	1.4757E+03	1.177E+03
Y-88	#B	0.0000E+00	0.0000E+00	8.0614E-02	8.0614E-02	9.151E-02
NB-94	#B	-5.4729E-03	-5.4729E-03	3.5362E-02	3.5364E-02	3.911E-02
Ag-108M	#B	5.9725E-04	5.9735E-04	3.3815E-02	3.3815E-02	4.144E-02
CD-109	#A	-5.2077E-03	-5.2991E-03	1.2251E+00	1.2251E+00	1.441E+00
SN-113	#B	2.3212E-02	2.4858E-02	5.2275E-02	5.2294E-02	5.399E-02
SB-125	#B	6.8965E-02	6.9504E-02	7.9145E-02	7.9242E-02	1.116E-01
I-131	#B	3.4941E-05	9.3181E-05	1.0142E-01	1.0142E-01	4.434E-02
CS-134	#B	-2.1056E-02	-2.1277E-02	5.2925E-02	5.2938E-02	5.431E-02
CS-137	#A	2.6076E-02	2.6095E-02	4.4449E-02	4.4474E-02	4.851E-02
CE-139	#A	-1.1403E-02	-1.2077E-02	3.9483E-02	3.9489E-02	4.038E-02
EU-152	#B	2.6043E-02	2.6088E-02	1.1209E-01	1.1210E-01	1.250E-01
EU-154	#B	9.9334E-03	9.9587E-03	8.0620E-02	8.0622E-02	9.037E-02
EU-155	#B	4.1557E-03	4.1739E-03	1.5322E-01	1.5322E-01	1.709E-01
HG-203	#B	-6.8821E-03	-8.1514E-03	4.9132E-02	4.9134E-02	4.694E-02
TL-208	#	1.7575E-01	1.7575E-01	5.9453E-02	6.0277E-02	4.403E-02
PB-212	#	4.6949E-01	4.6949E-01	1.1599E-01	1.1898E-01	1.040E-01
PB-214	#	4.1048E-01	4.1048E-01	1.2058E-01	1.2279E-01	9.861E-02
BI-212	#	4.1580E-01	4.1580E-01	3.8367E-01	3.8439E-01	3.830E-01
BI-214		4.8032E-01	4.8032E-01	1.4190E-01	1.4447E-01	
RA-224	#A	9.9145E-01	9.9145E-01	1.1052E+00	1.1066E+00	1.190E+00
RA-226	#	1.2208E+00	1.2208E+00	1.0797E+00	1.0819E+00	1.145E+00
AC-228	#	5.2027E-01	5.2027E-01	1.7663E-01	1.7906E-01	1.857E-01
TH-227	#B	-1.0323E-01	-1.0323E-01	3.9586E-01	3.9590E-01	4.248E-01
PA-234	#B	-3.1219E-02	-3.1219E-02	1.6033E-01	1.6034E-01	1.789E-01
TH-234	#B	5.0051E-01	5.0051E-01	1.9387E+00	1.9389E+00	2.163E+00
AM-241	#A	-6.5741E-02	-6.5744E-02	2.8380E-01	2.8382E-01	2.946E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (295.1 to 1999.1 keV) 1.3202206E+01 pCi/gm
Total Decayed Activity (295.1 to 1999.1 keV) 1.3202206E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JPK

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 102F_7SEP2006_1431.An1

Sample description
FSS-OOL-05-03-016-F

Spectrum Filename: C:\GammaVision\Spectra\102F_7SEP2006_1431.An1

Acquisition information
Start time: 07-Sep-2006 14:31:13
Live time: 2000
Real time: 2015
Dead time: 0.73 %
Detector ID: 3

Detector system
Det 102 - DSPP-468

Calibration
Filename: D2_1LSa.Clb
DET 102 1 Liter Sand Geometry

Energy Calibration
Created: 15-Jan-2005 03:09:29
Zero offset: 0.220 keV
Gain: 0.500 keV/channel
Quadratic: -6.435E-08 keV/channel^2

Efficiency Calibration
Created: 15-Jan-2005 06:48:10
Type: Polynomial
Uncertainty: 0.497 %
Coefficients: -0.294180 -5.980622 0.744607
-0.096737 0.005214 -0.000120

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.22keV)
Stop channel: 4000 (1999.02keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 1.5380E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.5380E+03) =
6.5020E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	01-Sep-2006 07:40:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	102_150K_28APR05.Pbc 01-May-2005 05:27:47
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 10 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.7098

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
77.21	175.	22.01	1.50	9.541E-03	77.11	10.700	1.508E+00	PB214
					77.11	17.500	9.220E-01	PB212
77.21	175.	22.01	1.50	9.541E-03	77.11	10.700	1.508E+00	PB214
					77.11	17.500	9.220E-01	PB212
186.54	55.	40.15	1.50	1.627E-02	185.99	3.280	PBC<MDA	RA226
210.43	69.	36.95	1.29	1.514E-02				
239.10	394.	6.22	1.22	1.379E-02	238.63	43.100	5.822E-01	PB212
241.67	62.	33.81	1.22	1.367E-02	241.00	3.900	PBC<MDA	RA224
					241.92	7.470	5.322E-01	PB214
253.62	33.	39.04	1.50	1.302E-02	255.04	2.070	1.120E+00	SN113
					256.25	6.800	3.295E-01	TH227
271.29	40.	41.16	1.44	1.239E-02				
295.86	136.	16.99	0.82	1.144E-02	295.22	19.200	5.424E-01	PB214
338.98	77.	16.48	0.97	1.004E-02	338.40	12.010	5.600E-01	AC228
352.60	190.	10.91	1.14	9.662E-03	351.99	37.100	4.647E-01	PB214
511.01	87.	18.89	1.79	6.691E-03	510.72	22.500	5.063E-01	TL208
584.34	153.	12.67	1.42	5.878E-03	583.14	86.000	2.650E-01	TL208
610.57	105.	14.85	1.69	5.638E-03	609.32	46.090	3.543E-01	BI214
663.02	30.	29.63	1.51	5.229E-03	661.62	84.620	6.001E-02	CS137
913.13	135.	11.23	2.14	3.914E-03	911.07	29.000	1.038E+00	AC228
1463.41	340.	5.50	2.03	2.617E-03	1460.75	10.700	1.063E+01	K40

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide

420.49	210.43	216.	69.	0.035	110.86	1.289	TH-227	sM

Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM	Suspected	
477.83	238.97	104.	394.	0.197	18.67	1.215	PB-212	D
482.98	241.55	187.	62.	0.031	101.43	1.217	PB-214	D
1826.41	913.13	115.	42.	0.021	118.52	2.138	AC-228	sM

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.
M - Peak is close to a library peak.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-214	153.80	77.11	656.	175.	0.088	66.03	1.500D
PB-212	153.80	77.11	656.	175.	0.088	66.03	1.500D
PB-212	477.78	239.08	260.	342.	0.171	25.74	1.500
TH-227	506.87	253.62	67.	33.	0.017	117.13	1.500s
PB-214	591.35	295.85	118.	99.	0.050	55.48	1.500s
AC-228	677.52	338.92	57.	85.	0.043	49.66	1.500
PB-214	704.88	352.60	56.	165.	0.083	30.13	1.500
TL-208	1021.46	510.84	53.	90.	0.045	54.62	1.801s
TL-208	1168.52	584.34	59.	153.	0.076	38.00	1.417
BI-214	1220.99	610.57	46.	105.	0.052	44.54	1.693
CS-137	1325.94	663.02	25.	30.	0.015	88.88	1.509s
AC-228	1825.82	912.84	31.	93.	0.046	40.12	1.679
K-40	2927.77	1463.43	6.	322.	0.161	17.02	2.042

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	Peak MDA Value pCi/gm	COMMENTS
BE-7		-1.2473E-01					
			477.56	-1.247E-01	%(	4.781E-01	1.40E-01 G
K-40		1.0075E+01					
			1460.75	1.008E+01	(P	4.393E-01	5.72E-01 G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
MN-54	-6.4547E-03						
		834.81	-6.455E-03	&(P	5.858E-02	1.64E-02	G
CO-57	-1.3199E-03						
		122.07	-1.320E-03	%(	5.711E-02	1.68E-02	G K
		136.43	2.525E-03	%	3.794E-01	1.11E-01	G
CO-60	-4.8650E-03						
		1332.51	-4.865E-03	%(P	6.709E-02	1.82E-02	G K
		1173.23	2.396E-02	&	8.324E-02	2.44E-02	G K
Sr-85	-2.2446E-02						
		514.00	-2.245E-02	%(	6.810E-02	2.03E-02	G
Kr-85	-4.8453E+02						
		513.99	-4.845E+02	%(	1.470E+03	4.38E+02	G
Y-88	-5.7424E-03						
		1836.01	-5.742E-03	%(P	5.609E-02	1.44E-02	G K
		898.02	-4.163E-03	% P	5.732E-02	1.54E-02	G
NB-94	-3.6541E-03						
		871.10	-3.654E-03	%(	4.261E-02	1.15E-02	G K
		702.50	5.531E-03	&	5.512E-02	1.56E-02	G K
Ag-108M	-5.6625E-03						
		722.95	-5.662E-03	%(	5.529E-02	1.55E-02	G K
		614.37	-3.670E-02	% P	7.583E-02	2.30E-02	G
		433.93	1.249E-04	&	4.579E-02	1.29E-02	G
CD-109	9.1247E-01						
		88.04	9.125E-01	%(P	2.277E+00	6.88E-01	G
SN-113	8.3957E-03						
		391.71	8.396E-03	&(	6.425E-02	1.85E-02	G K
		255.04	9.820E-01	%	1.540E+00	4.76E-01	G
SB-125	-3.9204E-02						
		427.95	-3.920E-02	&(P	1.523E-01	4.43E-02	G K
		600.77	-4.627E-02	% P	2.931E-01	8.42E-02	G
		636.15	-6.660E-02	% P	4.421E-01	1.26E-01	G
		463.51	2.577E-01	% P	4.333E-01	1.33E-01	G
		176.29	-1.145E-02	& P	6.944E-01	2.03E-01	G
I-131	2.1897E-02						
		364.48	2.190E-02	%(	6.941E-02	2.05E-02	G K
		636.97	-1.654E-01	%	1.057E+00	3.00E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
		284.29	-2.015E-01	%	1.064E+00	3.13E-01	G
CS-134	6.5693E-03						
		604.66	6.569E-03	%(	5.256E-02	1.50E-02	G K
		795.76	1.831E-02	%	6.120E-02	1.79E-02	G
		569.29	0.000E+00	%	3.512E-01	9.88E-02	G
		801.84	-6.869E-02	% P	6.563E-01	1.84E-01	G
CS-137	6.0006E-02						
		661.62	6.001E-02	&(	5.161E-02	1.78E-02	G
CE-139	-1.2005E-02						
		165.85	-1.200E-02	%(P	5.783E-02	1.72E-02	G
EU-152	-3.5246E-02						
		121.78	-3.525E-02	%(P	1.592E-01	4.74E-02	G K
		344.30	4.104E-02	%	1.099E-01	3.28E-02	G
		1408.08	4.068E-02	&	2.192E-01	5.94E-02	G
		964.00	-8.320E-02	% P	5.221E-01	1.49E-01	G
		1112.07	2.210E-03	%	4.714E-01	1.27E-01	G
		778.90	-1.685E-03	% P	4.226E-01	1.16E-01	G
EU-154	-6.4697E-03						
		123.10	-6.470E-03	%(P	1.175E-01	3.47E-02	G K
		1274.80	0.000E+00	%	2.822E-01	7.87E-02	G
		723.30	-9.059E-02	% P	3.113E-01	9.12E-02	G
		1004.80	1.024E-01	%	2.922E-01	8.60E-02	G
EU-155	-3.7871E-03						
		86.45	-3.787E-03	&(P	2.949E-01	8.75E-02	G K
		105.31	8.548E-02	&	2.336E-01	7.03E-02	G
HG-203	1.9706E-02						
		279.17	1.971E-02	%(P	5.368E-02	1.61E-02	G K
		72.87	6.315E-02	&	2.461E+00	7.33E-01	G
		70.83	-1.696E+00	&	4.220E+00	1.28E+00	G
		82.50	-2.948E-01	%	4.665E+00	1.39E+00	G
TL-208	2.6504E-01						
		583.14	2.650E-01	(P	6.690E-02	3.37E-02	G
		510.72	5.261E-01	+	2.133E-01	9.59E-02	G
PB-212	5.0575E-01						
		238.63	5.058E-01	(	1.150E-01	4.34E-02	G K Energy duplication
		77.11	9.220E-01	+	6.423E-01	2.03E-01	G
		74.81	6.343E-01	& P	1.347E+00	4.08E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
PB-214	4.0118E-01						
		351.99	4.042E-01	(P	9.181E-02	4.07E-02	G K
		295.22	3.954E-01	(	2.131E-01	7.31E-02	G
							Energy duplication
		77.11	1.508E+00	+	1.051E+00	3.32E-01	G
		241.92	4.180E-01	%	6.926E-01	2.12E-01	G
BI-212	2.9960E-01						
		727.17	2.996E-01	%(	5.161E-01	1.59E-01	G K
		1620.56	-1.765E-01	& P	2.350E+00	6.08E-01	G
		785.42	4.890E-01	% P	2.253E+00	6.41E-01	G
BI-214	3.5432E-01						
		609.32	3.543E-01	(	1.158E-01	5.27E-02	G K
		1764.51	-2.149E-03	% P	1.828E-01	2.48E-02	G
		1120.28	1.794E-03	&	5.287E-01	1.46E-01	G
RA-224	7.5273E-01						
		241.00	7.527E-01	&(P	1.351E+00	4.11E-01	G
RA-226	9.0200E-01						
		185.99	9.020E-01	%(P	1.276E+00	3.92E-01	G
AC-228	6.8742E-01						
		911.07	7.154E-01	(P	2.210E-01	9.59E-02	G K
		968.90	2.303E-01	% P	3.451E-01	1.09E-01	G
		338.40	6.198E-01	(	2.753E-01	1.03E-01	G
TH-227	1.7383E-02						
		236.00	-1.721E-01	%(P	4.621E-01	1.39E-01	G K
		256.25	3.295E-01	&(	4.066E-01	1.29E-01	G
PA-234	5.5016E-02						
		98.44	5.502E-02	%(	2.477E-01	7.41E-02	G K
		946.00	3.186E-02	&	2.582E-01	7.15E-02	G
		131.28	-6.187E-02	&	2.513E-01	7.52E-02	G
		94.67	-1.896E-01	&	5.129E-01	1.55E-01	G
		883.24	-4.933E-02	&	4.616E-01	1.29E-01	G
		926.70	3.164E-02	&	4.064E-01	1.09E-01	G
		569.26	0.000E+00	%	5.180E-01	1.46E-01	G
TH-234	3.9890E-01						
		63.29	3.989E-01	%(P	4.837E+00	1.44E+00	G K
		92.80	1.184E+00	%	2.619E+00	7.93E-01	G
		92.38	8.541E-02	& P	2.822E+00	8.36E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
AM-241	-9.7396E-02						
		59.54	-9.740E-02	%(	7.654E-01	2.28E-01	G

(- This peak used in the nuclide activity average.

* - Peak is too wide, but only one peak in library.
! - Peak is part of a multiplet and this area went negative during deconvolution.
? - Peak is too narrow.
@ - Peak is too wide at FW25M, but ok at FWHM.
% - Peak fails sensitivity test.
$ - Peak identified, but first peak of this nuclide failed one or more qualification tests.
+ - Peak activity higher than counting uncertainty range.
- - Peak activity lower than counting uncertainty range.
= - Peak outside analysis energy range.
& - Calculated peak centroid is not close enough to the library energy centroid for positive identification.
P - Peakbackground subtraction
} - Peak is too close to another for the activity to be found directly.

Nuclide Codes:
T - Thermal Neutron Activation
F - Fast Neutron Activation
I - Fission Product
N - Naturally Occurring Isotope
P - Photon Reaction
C - Charged Particle Reaction
M - No MDA Calculation
R - Coincidence Corrected
H - Halflife limit exceeded

Peak Codes:
G - Gamma Ray
X - X-Ray
P - Positron Decay
S - Single-Escape
D - Double-Escape
K - Key Line
A - Not in Average
C - Coincidence Peak

- -

***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	-1.1496E-01	-1.2473E-01	4.2093E-01	4.2099E-01	4.406E-01
K-40		1.0075E+01	1.0075E+01	1.7158E+00	1.8065E+00	4.393E-01
MN-54	#A	-6.3652E-03	-6.4547E-03	5.6478E-02	5.6479E-02	5.776E-02
CO-57	#B	-1.2988E-03	-1.3199E-03	5.0538E-02	5.0539E-02	5.620E-02
CO-60	#B	-4.8540E-03	-4.8650E-03	6.0181E-02	6.0182E-02	6.694E-02
Sr-85	#A	-2.0988E-02	-2.2446E-02	6.0897E-02	6.0911E-02	6.367E-02
Kr-85	#A	-4.8451E+02	-4.8453E+02	1.3146E+03	1.3148E+03	1.470E+03
Y-88	#B	-5.5124E-03	-5.7424E-03	4.3523E-02	4.3524E-02	5.384E-02
NB-94	#B	-3.6540E-03	-3.6541E-03	3.4519E-02	3.4519E-02	4.261E-02
Ag-108M	#B	-5.6620E-03	-5.6625E-03	4.6482E-02	4.6483E-02	5.528E-02
CD-109	#A	9.0374E-01	9.1247E-01	2.0630E+00	2.0636E+00	2.255E+00

SN-113	#B	8.0838E-03	8.3957E-03	5.5583E-02	5.5585E-02	6.186E-02
SB-125	#B	-3.9035E-02	-3.9204E-02	1.6104E-01	1.6106E-01	1.516E-01
I-131	#B	1.2736E-02	2.1897E-02	6.1560E-02	6.1572E-02	4.037E-02
CS-134	#B	6.5314E-03	6.5693E-03	4.4986E-02	4.4988E-02	5.226E-02
CS-137	#	5.9982E-02	6.0006E-02	5.3330E-02	5.3437E-02	5.159E-02
CE-139	#A	-1.1630E-02	-1.2005E-02	5.4225E-02	5.4229E-02	5.603E-02
EU-152	#B	-3.5213E-02	-3.5246E-02	1.5551E-01	1.5553E-01	1.590E-01
EU-154	#B	-6.4606E-03	-6.4697E-03	1.1295E-01	1.1295E-01	1.173E-01
EU-155	#B	-3.7780E-03	-3.7871E-03	6.7870E-01	6.7870E-01	2.942E-01
HG-203	#B	1.7947E-02	1.9706E-02	4.8279E-02	4.8291E-02	4.889E-02
TL-208		2.6504E-01	2.6504E-01	1.0099E-01	1.0208E-01	
PB-212	#	5.0575E-01	5.0575E-01	1.3017E-01	1.3323E-01	1.150E-01
PB-214	#	4.0118E-01	4.0118E-01	1.2114E-01	1.2321E-01	9.181E-02
BI-212	#B	2.9960E-01	2.9960E-01	4.7764E-01	4.7794E-01	5.161E-01
BI-214		3.5432E-01	3.5432E-01	1.5781E-01	1.5906E-01	
RA-224	#A	7.5273E-01	7.5273E-01	1.2340E+00	1.2347E+00	1.351E+00
RA-226	#A	9.0200E-01	9.0200E-01	1.1749E+00	1.1760E+00	1.276E+00
AC-228		6.8742E-01	6.8742E-01	2.1964E-01	2.2300E-01	2.210E-01
TH-227	#B	1.7383E-02	1.7383E-02	2.0362E-02	2.0385E-02	4.621E-01
PA-234	#B	5.5016E-02	5.5016E-02	2.2224E-01	2.2226E-01	2.477E-01
TH-234	#B	3.9890E-01	3.9890E-01	4.3084E+00	4.3084E+00	4.837E+00
AM-241	#A	-9.7393E-02	-9.7396E-02	6.8407E-01	6.8409E-01	7.653E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (271.2 to 1999.0 keV) 1.1382011E+01 pCi/gm
Total Decayed Activity (271.2 to 1999.0 keV) 1.1382011E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JJM

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 102F_7SEPT2006_0937.An1

Sample description
FSS-OOL-05-03-012-F

Spectrum Filename: C:\GammaVision\Spectra\102F_7SEPT2006_0937.An1

Acquisition information
Start time: 07-Sep-2006 09:38:13
Live time: 2000
Real time: 2017
Dead time: 0.86 %
Detector ID: 3

Detector system
Det 102 - DSPP-468

Calibration
Filename: D2_1LSa.Clb
DET 102 1 Liter Sand Geometry

Energy Calibration
Created: 15-Jan-2005 03:09:29
Zero offset: 0.220 keV
Gain: 0.500 keV/channel
Quadratic: -6.435E-08 keV/channel^2

Efficiency Calibration
Created: 15-Jan-2005 06:48:10
Type: Polynomial
Uncertainty: 0.497 %
Coefficients: -0.294180 -5.980622 0.744607
-0.096737 0.005214 -0.000120

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.22keV)
Stop channel: 4000 (1999.02keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 1.6900E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.6900E+03) =
5.9172E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	01-Sep-2006 08:25:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	102_150K_28APR05.Pbc 01-May-2005 05:27:47
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 10 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.8370

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
77.18	154.	25.38	1.50	9.541E-03	77.11	10.700	1.203E+00	PB214
					77.11	17.500	7.357E-01	PB212
77.18	154.	25.38	1.50	9.541E-03	77.11	10.700	1.203E+00	PB214
					77.11	17.500	7.357E-01	PB212
92.81	125.	29.75	1.86	1.333E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	2.495E+00	TH234
186.15	86.	37.12	1.46	1.626E-02	185.99	3.280	PBC<MDA	RA226
239.09	481.	5.50	1.22	1.379E-02	238.63	43.100	6.467E-01	PB212
241.89	79.	27.48	1.22	1.366E-02	241.00	3.900	PBC<MDA	RA224
					241.92	7.470	6.216E-01	PB214
295.75	141.	22.17	1.29	1.145E-02	295.22	19.200	5.129E-01	PB214
328.71	55.	30.32	1.05	1.035E-02				
339.30	113.	19.12	1.51	1.003E-02	338.40	12.010	7.479E-01	AC228
352.46	198.	13.56	1.27	9.666E-03	351.99	37.100	4.396E-01	PB214
464.03	30.	37.84	1.50	7.365E-03	463.51	10.000	PBC<MDA	SB125
511.37	42.	29.42	1.50	6.695E-03	510.72	22.500	2.213E-01	TL208
584.03	152.	10.72	1.08	5.881E-03	583.14	86.000	2.401E-01	TL208
610.38	159.	10.52	1.47	5.640E-03	609.32	46.090	4.889E-01	BI214
912.67	102.	11.59	1.18	3.916E-03				
970.54	53.	23.31	1.72	3.718E-03	968.90	17.460	6.516E-01	AC228
1463.09	413.	5.08	1.75	2.617E-03	1460.75	10.700	1.176E+01	K40

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide

477.81	238.99	109.	481.	0.241	16.49	1.215	PB-212	D

Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM	Suspected	
483.41	241.79	198.	79.	0.040	82.43	1.217	PB-214	D
657.09	328.71	96.	55.	0.027	90.96	1.053	LA-140	M
1825.48	912.67	18.	99.	0.050	35.10	1.177	AC-228	M

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.
M - Peak is close to a library peak.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-214	153.80	77.11	683.	154.	0.077	76.13	1.500D
PB-212	153.80	77.11	683.	154.	0.077	76.13	1.500D
TH-234	185.18	92.80	663.	92.	0.046	122.48	1.500D
RA-226	371.80	186.10	318.	66.	0.033	113.03	1.500s
PB-212	477.73	239.05	302.	381.	0.191	24.69	1.500
PB-214	591.22	295.78	154.	103.	0.051	59.07	1.500
AC-228	677.61	338.97	113.	96.	0.048	56.09	1.500
PB-214	704.72	352.52	87.	170.	0.085	32.62	1.500
SB-125	927.82	464.03	58.	30.	0.015	113.53	1.500
TL-208	1022.51	511.37	54.	42.	0.021	88.26	1.500s
TL-208	1168.25	584.21	31.	143.	0.072	29.89	1.499
BI-214	1220.62	610.38	37.	159.	0.080	31.57	1.467
AC-228	1941.28	970.54	50.	53.	0.026	69.92	1.718
K-40	2927.07	1463.08	11.	376.	0.188	15.90	2.042

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Code	MDA Value pCi/gm	COMMENTS
BE-7		-1.1530E-01					
			477.56	-1.153E-01	&(	4.029E-01	1.18E-01 G
K-40		1.0736E+01					
			1460.75	1.074E+01	(P	5.186E-01	5.69E-01 G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
MN-54	-8.3905E-03						
		834.81	-8.390E-03	&(P	6.157E-02	1.75E-02	G
CO-57	-9.8997E-03						
		122.07	-9.900E-03	%(	5.837E-02	1.74E-02	G K
		136.43	8.657E-02	%	4.279E-01	1.28E-01	G
CO-60	4.2135E-04						
		1332.51	4.214E-04	%(P	4.929E-02	1.27E-02	G K
		1173.23	-4.734E-04	%	8.250E-02	2.30E-02	G K
Sr-85	1.3096E-03						
		514.00	1.310E-03	&(	5.513E-02	1.57E-02	G
Kr-85	-8.9295E+00						
		513.99	-8.930E+00	&(	1.218E+03	3.47E+02	G
Y-88	-2.0390E-03						
		1836.01	-2.039E-03	%(P	5.861E-02	1.48E-02	G K
		898.02	-1.248E-02	% P	6.726E-02	1.91E-02	G
NB-94	-3.3276E-03						
		871.10	-3.328E-03	%(	4.920E-02	1.36E-02	G K
		702.50	-9.920E-03	%	5.274E-02	1.52E-02	G K
Ag-108M	1.3408E-02						
		722.95	1.341E-02	%(	4.927E-02	1.43E-02	G K
		614.37	-4.841E-02	% P	8.223E-02	2.52E-02	G
		433.93	4.107E-03	&	4.079E-02	1.17E-02	G
CD-109	9.0279E-01						
		88.04	9.028E-01	%(P	2.081E+00	6.29E-01	G
SN-113	-1.5802E-03						
		391.71	-1.580E-03	%(	8.035E-02	2.32E-02	G K
		255.04	5.370E-01	%	1.720E+00	5.13E-01	G
SB-125	8.7893E-02						
		427.95	5.893E-03	%(P	1.524E-01	4.36E-02	G K
		600.77	-4.214E-02	& P	2.826E-01	8.14E-02	G
		636.15	-3.678E-02	& P	4.160E-01	1.17E-01	G
		463.51	3.306E-01	(P	4.176E-01	1.31E-01	G
		176.29	9.569E-02	& P	6.260E-01	1.85E-01	G
I-131	1.1457E-02						
		364.48	1.146E-02	&(	8.145E-02	2.37E-02	G K
		636.97	-5.992E-04	%	9.926E-01	2.73E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
		284.29	-3.687E-01	%	1.155E+00	3.45E-01	G
CS-134	1.8650E-02						
		604.66	1.865E-02	%(	4.307E-02	1.30E-02	G K
		795.76	2.630E-02	%	5.282E-02	1.61E-02	G
		569.29	0.000E+00	&	2.525E-01	6.95E-02	G
		801.84	1.886E-01	& P	5.651E-01	1.66E-01	G
CS-137	5.7152E-04						
		661.62	5.715E-04	&(	4.333E-02	1.17E-02	G
CE-139	-8.9060E-03						
		165.85	-8.906E-03	%(P	5.729E-02	1.70E-02	G
EU-152	-2.5751E-02						
		121.78	-2.575E-02	%(P	1.636E-01	4.87E-02	G K
		344.30	-2.394E-02	%	1.646E-01	4.82E-02	G
		1408.08	-2.725E-02	%	2.092E-01	5.55E-02	G
		964.00	-7.395E-02	% P	5.039E-01	1.44E-01	G
		1112.07	4.097E-03	%	5.146E-01	1.42E-01	G
		778.90	4.094E-02	% P	4.073E-01	1.15E-01	G
EU-154	-2.5097E-02						
		123.10	-2.510E-02	%(P	1.193E-01	3.56E-02	G K
		1274.80	-9.351E-03	&	2.267E-01	6.31E-02	G
		723.30	5.715E-02	% P	2.246E-01	6.49E-02	G
		1004.80	1.435E-02	&	3.319E-01	9.14E-02	G
EU-155	-7.8688E-03						
		86.45	-7.869E-03	%(P	2.225E-01	6.56E-02	G K
		105.31	4.024E-02	&	2.502E-01	7.46E-02	G
HG-203	1.1748E-03						
		279.17	1.175E-03	&(P	4.820E-02	1.39E-02	G K
		72.87	-1.546E-03	&	2.017E+00	5.98E-01	G
		70.83	-4.880E-02	%	3.518E+00	1.04E+00	G
		82.50	-1.103E+00	%	4.439E+00	1.33E+00	G
TL-208	2.2543E-01						
		583.14	2.265E-01	(P	4.538E-02	2.26E-02	G
		510.72	2.213E-01	*(	1.967E-01	6.51E-02	G
PB-212	5.1260E-01						
		238.63	5.126E-01	(	1.125E-01	4.22E-02	G K
							Energy duplication
		77.11	7.357E-01	+	5.962E-01	1.87E-01	G
		74.81	6.740E-01	& P	1.241E+00	3.77E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
PB-214	3.7675E-01						
		351.99	3.783E-01	(P	1.026E-01	4.12E-02	G K
		295.22	3.737E-01	(	2.197E-01	7.36E-02	G
							Energy duplication
		77.11	1.203E+00	+	9.751E-01	3.05E-01	G
		241.92	4.127E-01	%	7.033E-01	2.15E-01	G
BI-212	-8.1191E-02						
		727.17	-8.119E-02	%(	4.530E-01	1.30E-01	G K
		1620.56	-1.902E-01	& P	2.118E+00	5.51E-01	G
		785.42	1.528E-02	% P	2.387E+00	6.52E-01	G
BI-214	4.8890E-01						
		609.32	4.889E-01	(	9.514E-02	5.15E-02	G K
		1764.51	-1.956E-03	% P	6.090E-01	1.66E-01	G
		1120.28	-6.585E-02	%	5.322E-01	1.52E-01	G
RA-224	8.4057E-01						
		241.00	8.406E-01	%(P	1.350E+00	4.13E-01	G
RA-226	9.8348E-01						
		185.99	9.835E-01	(P	1.286E+00	3.96E-01	G
AC-228	3.3262E-01						
		911.07	1.515E-02	%(P	1.921E-01	5.34E-02	G K
		968.90	6.516E-01	(P	4.380E-01	1.52E-01	G
		338.40	6.355E-01	(	3.460E-01	1.19E-01	G
TH-227	-2.0627E-01						
		236.00	-2.063E-01	%(P	5.122E-01	1.55E-01	G K
		256.25	-1.275E-01	&	6.281E-01	1.86E-01	G
PA-234	5.8115E-02						
		98.44	5.811E-02	%(	2.565E-01	7.69E-02	G K
		946.00	-2.454E-03	%	2.186E-01	5.79E-02	G
		131.28	-5.409E-02	&	2.573E-01	7.70E-02	G
		94.67	0.000E+00	%	4.693E-01	1.39E-01	G
		883.24	3.444E-02	%	3.296E-01	8.97E-02	G
		926.70	4.492E-03	&	4.458E-01	1.20E-01	G
		569.26	0.000E+00	&	3.726E-01	1.03E-01	G
TH-234	2.1708E+00						
		63.29	2.422E+00	%(P	4.801E+00	1.46E+00	G K
							Energy duplication
		92.80	1.844E+00	*(	2.453E+00	7.53E-01	G
		92.38	-2.843E-02	% P	3.040E+00	9.03E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
AM-241	2.4821E-02						
		59.54	2.482E-02	%(	6.906E-01	2.05E-01	G

(- This peak used in the nuclide activity average.

* - Peak is too wide, but only one peak in library.
! - Peak is part of a multiplet and this area went negative during deconvolution.
? - Peak is too narrow.
@ - Peak is too wide at FW25M, but ok at FWHM.
% - Peak fails sensitivity test.
$ - Peak identified, but first peak of this nuclide failed one or more qualification tests.
+ - Peak activity higher than counting uncertainty range.
- - Peak activity lower than counting uncertainty range.
= - Peak outside analysis energy range.
& - Calculated peak centroid is not close enough to the library energy centroid for positive identification.
P - Peakbackground subtraction
} - Peak is too close to another for the activity to be found directly.

Nuclide Codes:
T - Thermal Neutron Activation
F - Fast Neutron Activation
I - Fission Product
N - Naturally Occurring Isotope
P - Photon Reaction
C - Charged Particle Reaction
M - No MDA Calculation
R - Coincidence Corrected
H - Halflife limit exceeded

Peak Codes:
G - Gamma Ray
X - X-Ray
P - Positron Decay
S - Single-Escape
D - Double-Escape
K - Key Line
A - Not in Average
C - Coincidence Peak

- -

***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	-1.0659E-01	-1.1530E-01	3.5538E-01	3.5544E-01	3.724E-01
K-40		1.0736E+01	1.0736E+01	1.7075E+00	1.8106E+00	5.186E-01
MN-54	#A	-8.2785E-03	-8.3905E-03	5.7892E-02	5.7894E-02	6.075E-02
CO-57	#B	-9.7471E-03	-9.8997E-03	5.2234E-02	5.2237E-02	5.747E-02
CO-60	#B	4.2043E-04	4.2135E-04	3.7966E-02	3.7967E-02	4.918E-02
Sr-85	#A	1.2276E-03	1.3096E-03	4.7163E-02	4.7163E-02	5.167E-02
Kr-85	#A	-8.9291E+00	-8.9295E+00	1.0407E+03	1.0407E+03	1.218E+03
Y-88	#B	-1.9603E-03	-2.0390E-03	4.5662E-02	4.5662E-02	5.635E-02
NB-94	#B	-3.3276E-03	-3.3276E-03	4.0682E-02	4.0682E-02	4.920E-02
Ag-108M	#B	1.3406E-02	1.3408E-02	4.2988E-02	4.2994E-02	4.926E-02
CD-109	#A	8.9447E-01	9.0279E-01	1.8881E+00	1.8887E+00	2.061E+00

SN-113	#B	-1.5236E-03	-1.5802E-03	6.9644E-02	6.9644E-02	7.748E-02
SB-125	#B	8.7529E-02	8.7893E-02	1.0488E-01	1.0499E-01	1.518E-01
I-131	#B	6.8003E-03	1.1457E-02	7.1080E-02	7.1082E-02	4.834E-02
CS-134	#B	1.8546E-02	1.8650E-02	3.8904E-02	3.8918E-02	4.283E-02
CS-137	#A	5.7130E-04	5.7152E-04	3.5120E-02	3.5120E-02	4.331E-02
CE-139	#A	-8.6384E-03	-8.9060E-03	5.4233E-02	5.4236E-02	5.557E-02
EU-152	#B	-2.5728E-02	-2.5751E-02	1.6318E-01	1.6318E-01	1.635E-01
EU-154	#B	-2.5064E-02	-2.5097E-02	1.0897E-01	1.0898E-01	1.191E-01
EU-155	#B	-7.8506E-03	-7.8688E-03	4.0979E+01	4.0979E+01	2.220E-01
HG-203	#B	1.0737E-03	1.1748E-03	4.1792E-02	4.1792E-02	4.405E-02
TL-208	#	2.2543E-01	2.2543E-01	6.7568E-02	6.8742E-02	4.538E-02
PB-212	#	5.1260E-01	5.1260E-01	1.2655E-01	1.2978E-01	1.125E-01
PB-214	#	3.7675E-01	3.7675E-01	1.2316E-01	1.2496E-01	1.026E-01
BI-212	#B	-8.1191E-02	-8.1191E-02	3.9095E-01	3.9098E-01	4.530E-01
BI-214		4.8890E-01	4.8890E-01	1.5434E-01	1.5676E-01	
RA-224	#A	8.4057E-01	8.4057E-01	1.2378E+00	1.2387E+00	1.350E+00
RA-226	#A	9.8347E-01	9.8348E-01	1.1872E+00	1.1885E+00	1.286E+00
AC-228	F	3.3262E-01	3.3262E-01	1.8657E-01	1.8751E-01	1.921E-01
TH-227	#B	-2.0627E-01	-2.0627E-01	4.7048E-01	4.7062E-01	5.122E-01
PA-234	#B	5.8115E-02	5.8115E-02	2.3056E-01	2.3058E-01	2.565E-01
TH-234	#B	2.1708E+00	2.1708E+00	2.3682E+00	2.3712E+00	4.801E+00
AM-241	#A	2.4821E-02	2.4821E-02	6.1421E-01	6.1421E-01	6.906E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (277.7 to 1999.0 keV) 1.1557064E+01 pCi/gm
Total Decayed Activity (277.7 to 1999.0 keV) 1.1557064E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JPK

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 102F_8SEP2006_0859.An1

Sample description
FSS-OOL-05-03-013-F

Spectrum Filename: C:\GammaVision\Spectra\102F_8SEP2006_0859.An1

Acquisition information
Start time: 08-Sep-2006 08:59:31
Live time: 2000
Real time: 2008
Dead time: 0.42 %
Detector ID: 3

Detector system
Det 102 - DSPP-468

Calibration
Filename: D2_1LSa.Clb
DET 102 1 Liter Sand Geometry

Energy Calibration
Created: 15-Jan-2005 03:09:29
Zero offset: 0.220 keV
Gain: 0.500 keV/channel
Quadratic: -6.435E-08 keV/channel^2

Efficiency Calibration
Created: 15-Jan-2005 06:48:10
Type: Polynomial
Uncertainty: 0.497 %
Coefficients: -0.294180 -5.980622 0.744607
-0.096737 0.005214 -0.000120

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.22keV)
Stop channel: 4000 (1999.02keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 2.5900E+02
Activity scaling factor: 1.0000E+06/(1.0000E+00* 2.5900E+02) =
3.8610E+03
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

YAEC Chemistry Lab Spectrum name: 102F_8SEP2006_0859.An1

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	01-Sep-2006 08:13:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	102_150K_28APR05.Pbc 01-May-2005 05:27:47
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 5 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.5582

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
238.87	95.	15.69	1.25	1.379E-02	238.63	43.100	8.366E-01	PB212
584.22	25.	28.92	1.50	5.890E-03	583.14	86.000	2.531E-01	TL208
609.85	22.	25.90	1.48	5.645E-03	609.32	46.090	4.368E-01	BI214
662.41	64.	16.16	2.44	5.229E-03	661.62	84.620	7.526E-01	CS137
1462.36	40.	15.81	1.59	2.618E-03	1460.75	10.700	7.414E+00	K40

No unknown peaks passed sensitivity test.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-212	477.40	238.88	37.	85.	0.043	44.23	1.500
TL-208	1168.27	584.22	14.	25.	0.012	86.76	1.499s
BI-214	1219.56	609.85	4.	22.	0.011	77.70	1.484
CS-137	1324.73	662.41	11.	64.	0.032	48.49	2.438s
K-40	2925.62	1462.36	0.	40.	0.020	47.43	1.592

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	Peak MDA Value pCi/gm	COMMENTS
BE-7		-1.0166E-01					
			477.56	-1.017E-01	%(	1.629E+00 4.40E-01	G
K-40		7.4144E+00					
			1460.75	7.414E+00	(P	1.371E+00 1.18E+00	G
MN-54		-3.6752E-02					
			834.81	-3.675E-02	%(P	2.436E-01 6.64E-02	G
CO-57		3.1765E-02					
			122.07	3.177E-02	%(	1.242E-01 3.63E-02	G K
			136.43	1.499E-01	%	8.007E-01 2.29E-01	G
CO-60		-1.4360E-03					
			1332.51	-1.436E-03	%(P	2.675E-01 6.56E-02	G K
			1173.23	0.000E+00	%	2.251E-01 5.47E-02	G K
Sr-85		-1.5938E-02					
			514.00	-1.594E-02	&(	2.054E-01 5.66E-02	G
Kr-85		-3.4140E+02					
			513.99	-3.414E+02	&(	4.400E+03 1.21E+03	G
Y-88		-1.6792E-04					
			1836.01	-1.679E-04	%(P	1.886E-01 2.56E-02	G K
			898.02	2.655E-02	& P	1.592E-01 3.97E-02	G
NB-94		-2.8022E-02					
			871.10	-2.802E-02	%(	2.259E-01 6.10E-02	G K
			702.50	-1.615E-02	%	1.971E-01 5.28E-02	G K
Ag-108M		2.9463E-02					
			722.95	2.946E-02	%(	1.656E-01 4.46E-02	G K
			614.37	-7.011E-02	% P	2.274E-01 6.58E-02	G
			433.93	-1.167E-02	&	1.520E-01 4.11E-02	G
CD-109		5.2843E-01					
			88.04	5.284E-01	%(P	7.290E+00 2.13E+00	G
SN-113		-2.7819E-02					
			391.71	-2.782E-02	%(	2.475E-01 6.91E-02	G K
			255.04	0.000E+00	%	6.884E+00 1.92E+00	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	-2.0427E-02						
		427.95	-2.043E-02	%(P	4.834E-01	1.25E-01	G K
		600.77	-1.289E-01	% P	9.782E-01	2.66E-01	G
		636.15	5.555E-02	% P	1.321E+00	3.36E-01	G
		463.51	6.227E-01	% P	1.435E+00	4.23E-01	G
		176.29	-1.903E-01	% P	1.496E+00	4.01E-01	G
I-131	0.0000E+00						
		364.48	0.000E+00	%(	2.967E-01	7.97E-02	G K
		636.97	-5.803E-02	&	3.625E+00	9.08E-01	G
		284.29	1.735E+00	&	3.119E+00	9.65E-01	G
CS-134	2.2195E-02						
		604.66	2.220E-02	%(	1.493E-01	4.02E-02	G K
		795.76	5.156E-02	%	1.689E-01	4.80E-02	G
		569.29	1.525E-01	%	1.027E+00	2.81E-01	G
		801.84	2.061E-01	% P	1.975E+00	5.14E-01	G
CS-137	7.5258E-01						
		661.62	7.526E-01	(	2.159E-01	1.22E-01	G
CE-139	-4.0865E-02						
		165.85	-4.086E-02	%(P	1.619E-01	4.74E-02	G
EU-152	1.0218E-01						
		121.78	1.022E-01	&(P	3.366E-01	9.85E-02	G K
		344.30	0.000E+00	%	4.397E-01	1.17E-01	G
		1408.08	0.000E+00	%	6.712E-01	9.11E-02	G
		964.00	1.847E-01	& P	1.405E+00	3.69E-01	G
		1112.07	1.368E-02	%	1.624E+00	3.99E-01	G
		778.90	-1.341E-01	% P	1.355E+00	3.53E-01	G
EU-154	6.0651E-02						
		123.10	6.065E-02	%(P	2.452E-01	7.14E-02	G K
		1274.80	3.339E-02	%	7.148E-01	1.80E-01	G
		723.30	1.234E-01	% P	7.580E-01	2.01E-01	G
		1004.80	-1.320E-01	%	1.186E+00	3.10E-01	G
EU-155	2.0349E-01						
		86.45	2.035E-01	&(P	9.938E-01	2.94E-01	G K
		105.31	1.151E-01	%	8.350E-01	2.44E-01	G
HG-203	-1.8186E-02						
		279.17	-1.819E-02	%(P	1.789E-01	5.04E-02	G K
		72.87	-1.982E+00	&	8.958E+00	2.67E+00	G
		70.83	-9.896E-02	%	1.538E+01	4.49E+00	G
		82.50	2.501E-01	%	1.627E+01	4.75E+00	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	2.5305E-01						
		583.14	2.531E-01	*(P	2.075E-01	7.44E-02	G
		510.72	4.059E-01	%	6.970E-01	2.18E-01	G
PB-212	7.4866E-01						
		238.63	7.487E-01	(	2.707E-01	1.10E-01	G K
							Energy duplication
		77.11	7.931E-01	%	2.367E+00	7.10E-01	G
		74.81	9.969E-03	& P	4.795E+00	1.40E+00	G
PB-214	1.7735E-01						
		351.99	1.774E-01	%(P	3.239E-01	9.98E-02	G K
		295.22	1.012E-01	%	6.040E-01	1.71E-01	G
							Energy duplication
		77.11	1.297E+00	%	3.871E+00	1.16E+00	G
		241.92	-4.537E-01	%	2.270E+00	6.65E-01	G
BI-212	-2.8331E-01						
		727.17	-2.833E-01	%(	1.765E+00	4.87E-01	G K
		1620.56	-8.008E-01	% P	8.265E+00	1.86E+00	G
		785.42	-6.831E-01	& P	8.771E+00	2.26E+00	G
BI-214	4.3684E-01						
		609.32	4.368E-01	(	2.457E-01	1.13E-01	G K
		1764.51	-1.590E-01	% P	1.968E+00	4.94E-01	G
		1120.28	1.650E-01	%	1.452E+00	3.78E-01	G
RA-224	-1.4407E-01						
		241.00	-1.441E-01	%(P	3.672E+00	1.02E+00	G
RA-226	1.4666E+00						
		185.99	1.467E+00	%(P	3.161E+00	9.34E-01	G
AC-228	-1.0500E-02						
		911.07	-1.050E-02	%(P	7.910E-01	2.00E-01	G K
		968.90	-2.166E-01	% P	1.393E+00	3.79E-01	G
		338.40	7.952E-01	%	1.064E+00	3.42E-01	G
TH-227	-4.0157E-01						
		236.00	-4.016E-01	%(P	1.552E+00	4.57E-01	G K
		256.25	-4.234E-02	&	1.651E+00	4.55E-01	G
PA-234	-6.0784E-02						
		98.44	-6.078E-02	%(	1.036E+00	3.04E-01	G K
		946.00	-6.899E-02	%	8.730E-01	2.19E-01	G
		131.28	-3.335E-02	&	5.309E-01	1.50E-01	G
		94.67	2.349E-01	%	1.800E+00	5.32E-01	G
		883.24	-1.627E-01	&	1.663E+00	4.36E-01	G
		926.70	-2.170E-01	%	1.870E+00	4.94E-01	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26 2.278E-01 %   1.512E+00 4.14E-01 G

TH-234       6.0865E-01
                           63.29 6.087E-01 %(P 1.986E+01 5.81E+00 G K
                           92.80 1.153E+00 &   9.143E+00 2.70E+00 G
                           92.38 7.455E-01 & P 1.163E+01 3.41E+00 G

AM-241      -3.3724E-01
                           59.54-3.372E-01 &(  2.872E+00 8.46E-01 G
   ( - This peak used in the nuclide activity average.

   * - Peak is too wide, but only one peak in library.
   ! - Peak is part of a multiplet and this area went
       negative during deconvolution.
   ? - Peak is too narrow.
   @ - Peak is too wide at FW25M, but ok at FWHM.
   % - Peak fails sensitivity test.
   $ - Peak identified, but first peak of this nuclide
       failed one or more qualification tests.
   + - Peak activity higher than counting uncertainty range.
   - - Peak activity lower than counting uncertainty range.
   = - Peak outside analysis energy range.
   & - Calculated peak centroid is not close enough to the
       library energy centroid for positive identification.
   P - Peakbackground subtraction
   } - Peak is too close to another for the activity
       to be found directly.

   Nuclide Codes:                      Peak Codes:
   T - Thermal Neutron Activation      G - Gamma Ray
   F - Fast Neutron Activation         X - X-Ray
   I - Fission Product                 P - Positron Decay
   N - Naturally Occurring Isotope     S - Single-Escape
   P - Photon Reaction                 D - Double-Escape
   C - Charged Particle Reaction       K - Key Line
   M - No MDA Calculation              A - Not in Average
   R - Coincidence Corrected           C - Coincidence Peak
   H - Halflife limit exceeded

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
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***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	-9.2789E-02	-1.0166E-01	1.3192E+00	1.3192E+00	1.487E+00
K-40		7.4144E+00	7.4144E+00	3.5303E+00	3.5547E+00	
MN-54	#A	-3.6182E-02	-3.6752E-02	2.3041E-01	2.3042E-01	2.398E-01
CO-57	#B	3.1197E-02	3.1765E-02	1.0890E-01	1.0891E-01	1.219E-01
CO-60	#B	-1.4323E-03	-1.4360E-03	3.0608E-02	3.0608E-02	2.668E-01

Sr-85	#A	-1.4784E-02	-1.5938E-02	1.6967E-01	1.6968E-01	1.906E-01
Kr-85	#A	-3.4139E+02	-3.4140E+02	3.6336E+03	3.6336E+03	4.399E+03
Y-88	#B	-1.6042E-04	-1.6792E-04	1.0075E-03	1.0076E-03	1.801E-01
NB-94	#B	-2.8022E-02	-2.8022E-02	1.8312E-01	1.8313E-01	2.259E-01
Ag-108M	#B	2.9459E-02	2.9463E-02	1.3369E-01	1.3370E-01	1.656E-01
CD-109	#A	5.2278E-01	5.2843E-01	6.3879E+00	6.3879E+00	7.212E+00
SN-113	#B	-2.6666E-02	-2.7819E-02	2.0725E-01	2.0726E-01	2.372E-01
SB-125	#B	-2.0329E-02	-2.0427E-02	8.9053E+00	8.9053E+00	4.811E-01
I-131	#B	0.0000E+00	0.0000E+00	2.3907E-01	2.3907E-01	1.618E-01
CS-134	#B	2.2052E-02	2.2195E-02	1.2068E-01	1.2069E-01	1.483E-01
CS-137		7.5224E-01	7.5258E-01	3.6496E-01	3.6739E-01	
CE-139	#A	-3.9442E-02	-4.0865E-02	1.5476E-01	1.5478E-01	1.563E-01
EU-152	#B	1.0207E-01	1.0218E-01	2.9564E-01	2.9570E-01	3.362E-01
EU-154	#B	6.0556E-02	6.0651E-02	2.1407E-01	2.1410E-01	2.448E-01
EU-155	#B	2.0294E-01	2.0349E-01	8.8234E-01	8.8241E-01	9.911E-01
HG-203	#B	-1.6379E-02	-1.8186E-02	1.6065E-01	1.6065E-01	1.611E-01
TL-208	#	2.5305E-01	2.5305E-01	2.2318E-01	2.2363E-01	2.075E-01
PB-212	#	7.4866E-01	7.4866E-01	3.3113E-01	3.3378E-01	2.707E-01
PB-214	#B	1.7735E-01	1.7735E-01	2.9927E-01	2.9944E-01	3.239E-01
BI-212	#B	-2.8331E-01	-2.8331E-01	1.4624E+00	1.4625E+00	1.765E+00
BI-214		4.3684E-01	4.3684E-01	3.3943E-01	3.4031E-01	
RA-224	#A	-1.4407E-01	-1.4407E-01	2.5703E+01	2.5703E+01	3.672E+00
RA-226	#A	1.4666E+00	1.4666E+00	2.8031E+00	2.8043E+00	3.161E+00
AC-228	#B	-1.0500E-02	-1.0500E-02	2.7458E-01	2.7458E-01	7.910E-01
TH-227	#B	-4.0157E-01	-4.0157E-01	1.4388E+00	1.4390E+00	1.552E+00
PA-234	#B	-6.0784E-02	-6.0784E-02	9.1169E-01	9.1169E-01	1.036E+00
TH-234	#B	6.0865E-01	6.0865E-01	1.7439E+01	1.7439E+01	1.986E+01
AM-241	#A	-3.3723E-01	-3.3724E-01	2.5376E+00	2.5377E+00	2.872E+00

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (50.2 to 1999.0 keV) 8.6034555E+00 pCi/gm
Total Decayed Activity (50.2 to 1999.0 keV) 8.6037893E+00 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JJM

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 103F_5SEPT2006_1104.An1

Sample description
OOL-05-03-018-F-S WET

Spectrum Filename: C:\GammaVision\Spectra\103F_5SEPT2006_1104.An1

Acquisition information
Start time: 05-Sep-2006 11:04:01
Live time: 2000
Real time: 2001
Dead time: 0.07 %
Detector ID: 4

Detector system
Det 103 - DSPE-471

Calibration
Filename: D3_1LSa.Clb
Detector_103 1.0 Liter Sand Geometry

Energy Calibration
Created: 08-Aug-2005 11:09:41
Zero offset: 0.409 keV
Gain: 0.500 keV/channel
Quadratic: 1.092E-08 keV/channel^2

Efficiency Calibration
Created: 08-Aug-2005 11:11:25
Type: Polynomial
Uncertainty: 0.993 %
Coefficients: -0.264059 -5.138468 0.638383
-0.089199 0.005011 -0.000129

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.41keV)
Stop channel: 4000 (2000.67keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 1.5760E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.5760E+03) =
6.3452E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	01-Sep-2006 08:45:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	103_150K_05AUG05.Pbc 08-Aug-2005 12:54:15
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 17 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.0858

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
74.98	85.	26.83	0.99	9.052E-03	74.81	9.600	8.352E-01	PB212
77.28	96.	20.30	0.99	1.011E-02	77.11	17.500	6.295E-01	PB212
					77.11	10.700	1.030E+00	PB214
92.85	66.	40.85	1.50	1.631E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
186.01	123.	23.16	1.36	2.567E-02	185.99	3.280	1.125E+00	RA226
238.76	676.	4.49	1.09	2.319E-02	238.63	43.100	5.692E-01	PB212
241.38	95.	26.22	1.09	2.305E-02	241.00	3.900	9.016E-01	RA224
					241.92	7.470	4.717E-01	PB214
270.35	72.	31.42	1.07	2.151E-02				
295.25	178.	15.53	1.02	2.025E-02	295.22	19.200	3.845E-01	PB214
338.51	128.	17.14	0.97	1.830E-02	338.40	12.010	4.951E-01	AC228
351.99	264.	8.83	1.12	1.775E-02	351.99	37.100	3.361E-01	PB214
464.17	47.	32.52	1.01	1.423E-02				
510.74	124.	17.87	1.82	1.317E-02	510.72	22.500	2.816E-01	TL208
583.10	252.	9.14	1.50	1.185E-02	583.14	86.000	2.088E-01	TL208
609.16	208.	9.19	1.21	1.144E-02	609.32	46.090	3.278E-01	BI214
661.49	121.	16.06	1.35	1.072E-02	661.62	84.620	1.129E-01	CS137
727.31	52.	25.25	0.97	9.963E-03	727.17	11.800	3.741E-01	BI212
794.90	26.	33.85	1.50	9.301E-03	795.76	85.400	PBC<MDA	CS134
860.78	35.	25.77	1.03	8.766E-03				
911.33	158.	9.80	1.47	8.399E-03	911.07	29.000	5.460E-01	AC228
964.36	32.	27.38	1.54	8.054E-03	964.00	14.580	2.288E-01	EU152
969.26	77.	14.55	1.54	8.023E-03	968.90	17.460	4.695E-01	AC228
1119.94	54.	35.50	1.19	7.212E-03	1120.28	15.040	4.301E-01	BI214
1460.78	777.	3.61	2.01	5.932E-03	1460.75	10.700	1.025E+01	K40
1764.46	52.	13.48	2.77	5.142E-03	1764.51	15.920	5.419E-01	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
539.85	270.35	178.	72.	0.036	94.25	1.072	AC-228	s
927.46	464.17	70.	47.	0.023	97.56	1.013	SB-125	l
1720.60	860.78	20.	35.	0.017	77.30	1.029	TL-208	
1928.37	964.37	18.	36.	0.018	70.29	1.538	AC-228	D

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-212	148.79	74.81	236.	85.	0.042	80.50	0.993D
PB-212	153.39	77.11	231.	96.	0.048	60.89	0.995A
RA-226	371.22	186.03	423.	109.	0.054	75.59	1.500s
PB-212	476.72	238.78	464.	627.	0.313	20.25	1.073
RA-224	482.60	241.72	431.	88.	0.044	104.73	1.500
PB-214	589.65	295.25	215.	174.	0.087	46.60	1.020
AC-228	676.16	338.51	137.	127.	0.063	51.43	0.967s
PB-214	703.12	351.99	122.	258.	0.129	26.49	1.116
TL-208	1020.59	510.74	135.	97.	0.049	53.62	1.817s
TL-208	1165.31	583.10	80.	248.	0.124	27.42	1.500
BI-214	1217.42	609.16	69.	202.	0.101	27.57	1.211
CS-137	1322.06	661.49	69.	119.	0.060	48.17	1.351s
BI-212	1453.69	727.31	45.	51.	0.026	75.76	0.967
CS-134	1588.85	794.90	27.	26.	0.013	101.55	1.500s
AC-228	1821.69	911.33	32.	155.	0.078	29.39	1.473
EU-152	1928.36	964.67	31.	27.	0.013	103.31	1.538
AC-228	1936.81	968.90	21.	77.	0.039	42.39	1.541D
BI-214	2238.86	1119.94	86.	54.	0.027	106.50	1.188s
K-40	2920.43	1460.78	22.	758.	0.379	10.83	2.007
BI-214	3527.67	1764.46	3.	52.	0.026	40.45	2.769s

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Code	MDA Value pCi/gm		COMMENTS
BE-7		0.0000E+00						
			477.56	0.000E+00	&(	3.422E-01	9.87E-02	G
K-40		1.0246E+01						
			1460.75	1.025E+01	(P	3.286E-01	3.79E-01	G
MN-54		-1.3722E-03						
			834.81	-1.372E-03	%(P	3.529E-02	9.93E-03	G
CO-57		-3.3716E-05						
			122.07	-3.372E-05	%(P	4.220E-02	1.24E-02	G K
			136.43	-1.824E-03	%	3.458E-01	1.02E-01	G
CO-60		-3.5802E-03						
			1332.51	-3.580E-03	&(P	2.521E-02	5.75E-03	G K
			1173.23	-5.143E-04	& P	4.310E-02	1.19E-02	G K
Sr-85		-1.2711E-02						
			514.00	-1.271E-02	&(	4.140E-02	1.24E-02	G
Kr-85		-2.8089E+02						
			513.99	-2.809E+02	&(	9.148E+02	2.73E+02	G
Y-88		-1.5078E-03						
			1836.01	-1.508E-03	&(P	3.206E-02	8.39E-03	G K
			898.02	1.054E-02	% P	2.865E-02	8.45E-03	G
NB-94		-4.1649E-05						
			871.10	-4.165E-05	%(	2.857E-02	7.86E-03	G K
			702.50	4.452E-03	%	2.959E-02	8.51E-03	G K
Ag-108M		1.0077E-03						
			722.95	1.008E-03	%(	6.120E-02	1.78E-02	G K
			614.37	2.127E-03	& P	3.082E-02	8.76E-03	G
			433.93	-7.709E-03	%	3.170E-02	9.36E-03	G
CD-109		6.0052E-01						
			88.04	6.005E-01	%(	1.784E+00	5.37E-01	G
SN-113		7.1587E-03						
			391.71	7.159E-03	%(	4.140E-02	1.21E-02	G K
			255.04	-1.467E-01	%	1.560E+00	4.61E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	2.7660E-02						
		427.95	2.766E-02	%(P	7.938E-02	2.37E-02	G K
		600.77	2.132E-02	& P	1.657E-01	4.79E-02	G
		636.15	6.832E-03	% P	2.235E-01	6.23E-02	G
		463.51	1.703E-01	% P	2.718E-01	8.36E-02	G
		176.29	-1.121E-02	&	5.416E-01	1.60E-01	G
I-131	-6.6398E-03						
		364.48	-6.640E-03	%(P	4.978E-02	1.45E-02	G K
		636.97	2.455E-02	%	4.549E-01	1.27E-01	G
		284.29	-1.338E-01	& P	7.508E-01	2.23E-01	G
CS-134	1.2823E-02						
		604.66	-8.156E-04	&(	7.000E-02	2.06E-02	G K
		795.76	2.841E-02	(P	2.897E-02	9.65E-03	G
		569.29	-8.177E-03	& P	1.766E-01	4.91E-02	G
		801.84	-1.745E-02	& P	3.627E-01	9.95E-02	G
CS-137	1.1288E-01						
		661.62	1.129E-01	*(P	3.904E-02	1.83E-02	G
CE-139	2.4561E-05						
		165.85	2.456E-05	%(	3.865E-02	1.14E-02	G
EU-152	6.4975E-02						
		121.78	5.288E-04	%(P	1.225E-01	3.61E-02	G K
		344.30	5.439E-03	& P	1.145E-01	3.34E-02	G
		1408.08	3.206E-02	%	1.177E-01	3.36E-02	G
		964.00	1.942E-01	(P	2.082E-01	6.83E-02	G
		1112.07	-6.476E-02	%	2.799E-01	8.13E-02	G
		778.90	-3.530E-02	&	2.316E-01	6.64E-02	G
EU-154	1.5889E-02						
		123.10	1.589E-02	&(	9.517E-02	2.84E-02	G K
		1274.80	9.503E-04	&	1.167E-01	3.24E-02	G
		723.30	-7.773E-02	&	1.958E-01	5.88E-02	G
		1004.80	-1.409E-02	%	1.827E-01	5.12E-02	G
EU-155	6.7770E-02						
		86.45	6.777E-02	&(	2.167E-01	6.52E-02	G K
		105.31	9.023E-04	%	2.161E-01	6.40E-02	G
HG-203	7.3294E-05						
		279.17	7.329E-05	&(P	3.950E-02	1.16E-02	G K
		72.87	-3.340E-01	& P	2.147E+00	6.41E-01	G
		70.83	-1.016E-01	%	3.910E+00	1.16E+00	G
		82.50	-1.122E+00	%	3.583E+00	1.08E+00	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	2.0884E-01						
		583.14	2.088E-01	(P	3.735E-02	1.94E-02	G
		510.72	2.816E-01	+ P	1.643E-01	6.41E-02	G
PB-212	5.6411E-01						
		238.63	5.376E-01	(P	8.842E-02	3.70E-02	G K
							Energy duplication
		77.11	4.630E-01	} P	3.563E-01	9.40E-02	G
		74.81	8.352E-01	+ P	7.337E-01	2.32E-01	G
PB-214	3.5261E-01						
		351.99	3.361E-01	(P	7.049E-02	3.03E-02	G K
		295.22	3.845E-01	(P	1.566E-01	6.11E-02	G
							Energy duplication
		77.11	2.674E-01	} P	8.335E-01	2.08E-01	G
		241.92	2.150E-01	%	5.234E-01	1.58E-01	G
BI-212	3.7414E-01						
		727.17	3.741E-01	(P	2.469E-01	9.54E-02	G K
		1620.56	1.598E-01	% P	8.535E-01	2.32E-01	G
		785.42	8.560E-01	%	1.386E+00	4.31E-01	G
BI-214	3.2775E-01						
		609.32	3.278E-01	(P	6.758E-02	3.11E-02	G K
		1764.51	5.419E-01	+ P	1.167E-01	7.77E-02	G
		1120.28	4.301E-01	+ P	3.622E-01	1.58E-01	G
RA-224	8.4167E-01						
		241.00	8.417E-01	(	9.480E-01	2.94E-01	G
RA-226	1.1086E+00						
		185.99	1.109E+00	@(P	1.004E+00	3.13E-01	G
AC-228	5.1319E-01						
		911.07	5.460E-01	(P	1.021E-01	5.47E-02	G K
		968.90	4.712E-01	(P	1.472E-01	6.67E-02	G
		338.40	4.951E-01	@(P	2.234E-01	8.56E-02	G
TH-227	-8.6457E-02						
		236.00	-8.646E-02	%(	3.543E-01	1.06E-01	G K
		256.25	5.951E-02	% P	4.533E-01	1.34E-01	G
PA-234	-3.1435E-02						
		98.44	-3.143E-02	&(P	2.117E-01	6.31E-02	G K
		946.00	1.275E-03	% P	1.253E-01	3.38E-02	G
		131.28	-3.510E-02	% P	1.890E-01	5.64E-02	G
		94.67	-1.159E-01	% P	3.826E-01	1.15E-01	G
		883.24	-5.024E-02	%	2.462E-01	7.09E-02	G
		926.70	3.030E-03	&	2.862E-01	7.93E-02	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26-1.189E-02 & P 2.609E-01 7.25E-02 G

TH-234       1.2084E+00
                           63.29 1.208E+00 %(P 5.530E+00 1.65E+00 G K
                           92.80 9.469E-01 % P 1.926E+00 5.80E-01 G
                           92.38 1.347E+00 % P 2.307E+00 6.98E-01 G

AM-241      -2.7023E-01
                           59.54-2.702E-01 %(P 1.059E+00 3.17E-01 G
   ( - This peak used in the nuclide activity average.

   * - Peak is too wide, but only one peak in library.
   ! - Peak is part of a multiplet and this area went
       negative during deconvolution.
   ? - Peak is too narrow.
   @ - Peak is too wide at FW25M, but ok at FWHM.
   % - Peak fails sensitivity test.
   $ - Peak identified, but first peak of this nuclide
       failed one or more qualification tests.
   + - Peak activity higher than counting uncertainty range.
   - - Peak activity lower than counting uncertainty range.
   = - Peak outside analysis energy range.
   & - Calculated peak centroid is not close enough to the
       library energy centroid for positive identification.
   P - Peakbackground subtraction
   } - Peak is too close to another for the activity
       to be found directly.

   Nuclide Codes:                      Peak Codes:
   T - Thermal Neutron Activation      G - Gamma Ray
   F - Fast Neutron Activation         X - X-Ray
   I - Fission Product                 P - Positron Decay
   N - Naturally Occurring Isotope     S - Single-Escape
   P - Photon Reaction                 D - Double-Escape
   C - Charged Particle Reaction       K - Key Line
   M - No MDA Calculation              A - Not in Average
   R - Coincidence Corrected           C - Coincidence Peak
   H - Halflife limit exceeded

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
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***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	0.0000E+00	0.0000E+00	2.9599E-01	2.9599E-01	3.245E-01
K-40		1.0246E+01	1.0246E+01	1.1375E+00	1.2837E+00	
MN-54	#A	-1.3598E-03	-1.3722E-03	4.9832E-02	4.9832E-02	3.497E-02
CO-57	#B	-3.3363E-05	-3.3716E-05	5.3868E-02	5.3868E-02	4.175E-02
CO-60	#B	-3.5750E-03	-3.5802E-03	9.1300E-02	9.1301E-02	2.517E-02

Sr-85	#A	-1.2167E-02	-1.2711E-02	3.7070E-02	3.7077E-02	3.962E-02
Kr-85	#A	-2.8088E+02	-2.8089E+02	8.1914E+02	8.1930E+02	9.148E+02
Y-88	#B	-1.4681E-03	-1.5078E-03	2.9212E-02	2.9213E-02	3.121E-02
NB-94	#B	-4.1649E-05	-4.1649E-05	2.3579E-02	2.3579E-02	2.857E-02
Ag-108M	#B	1.0076E-03	1.0077E-03	5.3462E-02	5.3462E-02	6.119E-02
CD-109	#A	5.9677E-01	6.0052E-01	1.6121E+00	1.6125E+00	1.773E+00
SN-113	#B	6.9843E-03	7.1587E-03	3.6374E-02	3.6376E-02	4.039E-02
SB-125	#B	2.7583E-02	2.7660E-02	7.0983E-02	7.1001E-02	7.916E-02
I-131	#B	-4.6642E-03	-6.6398E-03	5.2203E-02	5.2204E-02	3.497E-02
CS-134	#B	1.2775E-02	1.2823E-02	1.3065E-02	1.3086E-02	6.974E-02
CS-137	#	1.1285E-01	1.1288E-01	5.5001E-02	5.5391E-02	
CE-139	#A	2.4059E-05	2.4561E-05	3.4150E-02	3.4150E-02	3.786E-02
EU-152	#B	6.4935E-02	6.4975E-02	6.8501E-02	6.8596E-02	1.224E-01
EU-154	#B	1.5874E-02	1.5889E-02	8.5186E-02	8.5191E-02	9.508E-02
EU-155	#B	6.7664E-02	6.7770E-02	1.9559E-01	1.9563E-01	2.163E-01
HG-203	#B	6.8960E-05	7.3294E-05	3.4653E-02	3.4653E-02	3.716E-02
TL-208		2.0884E-01	2.0884E-01	5.8252E-02	5.9501E-02	
PB-212		5.6411E-01	5.6411E-01	1.1643E-01	1.2095E-01	
PB-214		3.5261E-01	3.5261E-01	9.5455E-02	9.7626E-02	
BI-212		3.7414E-01	3.7414E-01	2.8619E-01	2.8702E-01	
BI-214		3.2775E-01	3.2775E-01	9.3277E-02	9.5198E-02	
RA-224	#A	8.4167E-01	8.4167E-01	8.8151E-01	8.8287E-01	9.480E-01
RA-226	#	1.1086E+00	1.1086E+00	9.3779E-01	9.3999E-01	1.004E+00
AC-228		5.1319E-01	5.1319E-01	1.2567E-01	1.2915E-01	
TH-227	#B	-8.6457E-02	-8.6457E-02	3.1847E-01	3.1851E-01	3.543E-01
PA-234	#B	-3.1435E-02	-3.1435E-02	2.1295E-01	2.1296E-01	2.117E-01
TH-234	#B	1.2084E+00	1.2084E+00	4.9385E+00	4.9390E+00	5.530E+00
AM-241	#A	-2.7023E-01	-2.7023E-01	9.6643E-01	9.6654E-01	1.059E+00

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (1120.0 to 2000.7 keV) 1.2699864E+01 pCi/gm
Total Decayed Activity (1120.0 to 2000.7 keV) 1.2699894E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JPK

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 103F_7SEP2006_1420.An1

Sample description
FSS-OOL-05-03-010-F

Spectrum Filename: C:\GammaVision\Spectra\103F_7SEP2006_1420.An1

Acquisition information
Start time: 07-Sep-2006 14:20:20
Live time: 2000
Real time: 2002
Dead time: 0.08 %
Detector ID: 4

Detector system
Det 103 - DSPE-471

Calibration
Filename: D3_1LSa.Clb
Detector_103 1.0 Liter Sand Geometry

Energy Calibration
Created: 08-Aug-2005 11:09:41
Zero offset: 0.409 keV
Gain: 0.500 keV/channel
Quadratic: 1.092E-08 keV/channel^2

Efficiency Calibration
Created: 08-Aug-2005 11:11:25
Type: Polynomial
Uncertainty: 0.993 %
Coefficients: -0.264059 -5.138468 0.638383
-0.089199 0.005011 -0.000129

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.41keV)
Stop channel: 4000 (2000.67keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 1.1240E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.1240E+03) =
8.8968E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	01-Sep-2006 07:35:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	103_150K_05AUG05.Pbc 08-Aug-2005 12:54:15
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 18 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.2219

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
74.92	112.	20.61	0.99	9.052E-03	74.81	9.600	1.547E+00	PB212
77.22	148.	13.28	0.99	1.011E-02	77.11	10.700	1.807E+00	PB214
					77.11	17.500	1.105E+00	PB212
93.02	99.	29.28	1.50	1.645E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
93.02	97.	30.26	1.50	1.631E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
186.24	145.	25.16	1.30	2.566E-02	185.99	3.280	1.886E+00	RA226
238.81	830.	3.99	1.09	2.319E-02	238.63	43.100	9.837E-01	PB212
241.90	100.	22.87	1.10	2.303E-02	241.00	3.900	1.340E+00	RA224
270.74	60.	37.02	1.16	2.148E-02				
295.40	188.	14.55	1.15	2.024E-02	295.22	19.200	5.676E-01	PB214
300.45	54.	31.97	0.77	2.000E-02				
328.31	56.	31.47	1.59	1.873E-02				
338.54	215.	10.72	1.29	1.830E-02	338.40	12.010	1.171E+00	AC228
352.09	385.	8.69	1.25	1.775E-02	351.99	37.100	6.925E-01	PB214
409.83	38.	40.43	1.12	1.574E-02				
463.19	48.	39.61	0.85	1.425E-02				
463.19	48.	39.61	0.85	1.425E-02	463.51	10.000	PBC<MDA	SB125
511.36	115.	15.18	1.49	1.316E-02	510.72	22.500	3.567E-01	TL208
583.43	266.	9.35	1.38	1.184E-02	583.14	86.000	3.089E-01	TL208
609.60	223.	9.19	1.25	1.144E-02	609.32	46.090	4.933E-01	BI214
661.97	267.	8.90	1.37	1.072E-02	661.62	84.620	3.521E-01	CS137
727.52	75.	21.54	1.57	9.961E-03	727.17	11.800	7.618E-01	BI212
795.18	60.	21.40	1.80	9.306E-03				
795.18	60.	21.40	1.80	9.306E-03	795.76	85.400	9.151E-02	CS134
803.13	34.	37.20	0.66	9.236E-03	801.84	8.730	4.848E-01	CS134

911.73	222.	7.93	1.69	8.397E-03	911.07	29.000	1.077E+00	AC228
964.60	24.	38.12	1.54	8.053E-03				
969.47	118.	11.08	1.54	8.023E-03	968.90	17.460	1.009E+00	AC228
1120.97	78.	16.19	1.83	7.209E-03	1120.28	15.040	8.480E-01	BI214
1461.46	792.	3.62	1.91	5.930E-03	1460.75	10.700	1.464E+01	K40
1620.81	17.	29.28	0.71	5.488E-03	1620.56	2.750	1.391E+00	BI212

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
1765.14	63.	12.60	1.98	5.140E-03	1764.51	15.920	8.773E-01	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide
482.96	241.81	213.	100.	0.050	68.62	1.095	PB-214 lD
540.63	270.74	190.	60.	0.030	111.07	1.156	AC-228 s
600.05	300.45	122.	54.	0.027	95.90	0.770	PB-212
655.77	328.31	118.	56.	0.028	94.42	1.592	RH-106M s
818.79	409.83	90.	38.	0.019	121.28	1.120	AC-228
1605.32	803.13	42.	34.	0.017	111.61	0.660	RH-106M l
1929.15	964.52	24.	32.	0.016	84.49	1.538	AC-228 D

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-212	148.79	74.81	226.	112.	0.056	61.83	0.993D
PB-212	153.39	77.11	260.	148.	0.074	39.85	0.995A
TH-234	185.22	93.02	558.	97.	0.048	90.77	1.500
TH-234	185.22	93.02	540.	99.	0.049	87.83	1.500
RA-226	371.33	186.09	357.	112.	0.056	71.52	1.284s
PB-212	476.77	238.81	478.	799.	0.400	16.82	0.972
PB-214	589.95	295.40	218.	184.	0.092	43.65	1.147
AC-228	676.23	338.54	139.	214.	0.107	32.16	1.288
PB-214	703.31	352.09	216.	379.	0.190	26.08	1.246
SB-125	925.49	463.18	130.	49.	0.024	105.55	1.500
TL-208	1021.83	511.36	105.	88.	0.044	45.55	1.487s
TL-208	1165.96	583.43	114.	262.	0.131	28.04	1.379
BI-214	1218.29	609.60	77.	216.	0.108	27.57	1.255
CS-137	1323.03	661.97	86.	266.	0.133	26.70	1.371
BI-212	1454.10	727.52	62.	75.	0.037	64.62	1.569s
CS-134	1589.65	795.29	27.	55.	0.028	56.63	1.500s
AC-228	1822.49	911.73	36.	218.	0.109	23.78	1.689
AC-228	1936.81	968.90	27.	118.	0.059	33.43	1.541D
BI-214	2240.92	1120.97	32.	77.	0.038	48.56	1.828s
K-40	2921.78	1461.46	28.	773.	0.387	10.86	1.906
BI-212	3240.42	1620.81	3.	17.	0.009	87.83	0.708s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
BI-214	3529.04	1765.14	3.	60.	0.030	37.80	1.976

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	Peak MDA Value pCi/gm	COMMENTS
BE-7		4.4520E-02					
			477.56	4.452E-02	%(	4.081E-01 1.18E-01	G
K-40		1.4643E+01					
			1460.75	1.464E+01	(P	5.177E-01 5.43E-01	G
MN-54		-1.1381E-03					
			834.81	-1.138E-03	%(P	5.413E-02 1.53E-02	G
CO-57		1.2218E-02					
			122.07	1.222E-02	%(P	6.849E-02 2.05E-02	G K
			136.43	-6.840E-02	%	5.085E-01 1.52E-01	G
CO-60		1.3661E-02					
			1332.51	1.366E-02	&(P	4.734E-02 1.34E-02	G K
			1173.23	-1.919E-02	% P	6.763E-02 1.95E-02	G K
Sr-85		-1.8274E-02					
			514.00	-1.827E-02	%(	5.879E-02 1.76E-02	G
Kr-85		-3.9448E+02					
			513.99	-3.945E+02	%(	1.269E+03 3.79E+02	G
Y-88		-1.5921E-04					
			1836.01	-1.592E-04	&(P	4.139E-02 1.04E-02	G K
			898.02	-5.867E-03	% P	5.156E-02 1.45E-02	G
NB-94		-3.8501E-03					
			871.10	-3.850E-03	%(	4.883E-02 1.39E-02	G K
			702.50	1.029E-02	&	5.004E-02 1.46E-02	G K
Ag-108M		1.4129E-03					
			722.95	1.413E-03	%(	8.541E-02 2.49E-02	G K
			614.37	-2.244E-02	% P	5.083E-02 1.53E-02	G
			433.93	-1.292E-02	%	5.088E-02 1.51E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CD-109	-4.9050E-01						
		88.04	-4.905E-01	%(	2.421E+00	7.24E-01	G
SN-113	1.3137E-02						
		391.71	1.314E-02	&(	6.911E-02	2.04E-02	G K
		255.04	3.845E-02	%	2.308E+00	6.79E-01	G
SB-125	9.6579E-02						
		427.95	-9.699E-03	&(P	1.562E-01	4.55E-02	G K
		600.77	-1.753E-02	% P	2.261E-01	6.47E-02	G
		636.15	-5.295E-03	% P	4.576E-01	1.30E-01	G
		463.51	4.112E-01	(P	4.730E-01	1.48E-01	G
		176.29	8.547E-02	%	7.400E-01	2.20E-01	G
I-131	2.3479E-02						
		364.48	2.348E-02	%(P	7.287E-02	2.17E-02	G K
		636.97	2.618E-01	&	1.056E+00	3.10E-01	G
		284.29	2.220E-01	% P	1.153E+00	3.42E-01	G
CS-134	3.3207E-02						
		604.66	-1.162E-02	&(	5.047E-02	1.49E-02	G K
		795.76	8.444E-02	(P	4.119E-02	1.60E-02	G
		569.29	6.815E-02	% P	2.963E-01	8.68E-02	G
		801.84	2.045E-01	% P	4.622E-01	1.38E-01	G
CS-137	3.5210E-01						
		661.62	3.521E-01	(P	6.101E-02	3.15E-02	G
CE-139	-6.3384E-04						
		165.85	-6.338E-04	%(	6.183E-02	1.83E-02	G
EU-152	3.4372E-02						
		121.78	3.437E-02	%(P	1.979E-01	5.91E-02	G K
		344.30	1.722E-03	% P	1.272E-01	3.66E-02	G
		1408.08	8.257E-02	%	1.843E-01	5.57E-02	G
		964.00	6.131E-03	% P	3.050E-01	8.42E-02	G
		1112.07	3.999E-02	%	3.882E-01	1.10E-01	G
		778.90	-7.729E-02	%	3.701E-01	1.08E-01	G
EU-154	2.5940E-02						
		123.10	2.594E-02	%(	1.345E-01	4.02E-02	G K
		1274.80	-1.594E-03	&	1.606E-01	4.46E-02	G
		723.30	-7.409E-02	%	2.861E-01	8.45E-02	G
		1004.80	-4.320E-02	&	2.711E-01	7.75E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
EU-155	1.7527E-01						
		86.45	1.753E-01	%(	3.142E-01	9.56E-02	G K
		105.31	8.222E-02	%	2.207E-01	6.64E-02	G
HG-203	-1.6678E-03						
		279.17	-1.668E-03	&(P	6.215E-02	1.83E-02	G K
		72.87	-8.289E-01	% P	3.431E+00	1.03E+00	G
		70.83	-2.728E+00	%	6.151E+00	1.86E+00	G
		82.50	-1.103E+00	%	5.681E+00	1.70E+00	G
TL-208	3.1878E-01						
		583.14	3.089E-01	(P	6.200E-02	2.94E-02	G
		510.72	3.567E-01	*(P	2.048E-01	7.07E-02	G
PB-212	1.0026E+00						
		238.63	9.610E-01	(P	1.257E-01	5.47E-02	G K
							Energy duplication
		77.11	1.003E+00	} P	5.291E-01	1.33E-01	G
		74.81	1.547E+00	+ P	1.007E+00	3.28E-01	G
PB-214	6.9248E-01						
		351.99	6.925E-01	(P	1.299E-01	6.11E-02	G K
		295.22	5.676E-01	- P	2.214E-01	8.45E-02	G
							Energy duplication
		77.11	0.000E+00	} P	1.245E+00	0.00E+00	G
		241.92	1.411E-01	%	5.616E-01	1.68E-01	G
BI-212	7.6180E-01						
		727.17	7.618E-01	*(P	4.044E-01	1.65E-01	G K
		1620.56	1.391E+00	+ P	8.081E-01	4.08E-01	G
		785.42	7.476E-01	%	1.981E+00	5.91E-01	G
BI-214	4.9330E-01						
		609.32	4.933E-01	(P	9.923E-02	4.67E-02	G K
		1764.51	8.773E-01	+ P	1.636E-01	1.17E-01	G
		1120.28	8.480E-01	+ P	3.245E-01	1.41E-01	G
RA-224	1.0029E+00						
		241.00	1.003E+00	&(	1.518E+00	4.64E-01	G
RA-226	1.5944E+00						
		185.99	1.594E+00	*(P	1.297E+00	4.24E-01	G
AC-228	1.0763E+00						
		911.07	1.077E+00	(P	1.507E-01	8.68E-02	G K
		968.90	1.009E+00	(P	2.324E-01	1.13E-01	G
		338.40	1.171E+00	(P	3.152E-01	1.26E-01	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments

TH-227      -2.5380E-01
                          236.00-2.538E-01 %(  5.508E-01 1.67E-01 G K
                          256.25-1.168E-01 % P 6.841E-01 2.03E-01 G

PA-234      -5.3864E-03
                           98.44-5.386E-03 &(P 2.931E-01 8.68E-02 G K
                          946.00-2.442E-03 & P 2.094E-01 5.76E-02 G
                          131.28-6.618E-03 & P 2.748E-01 8.14E-02 G
                           94.67-1.631E-01 & P 5.476E-01 1.65E-01 G
                          883.24 0.000E+00 %   3.991E-01 1.12E-01 G
                          926.70-1.439E-02 &   3.374E-01 9.26E-02 G
                          569.26 1.016E-01 % P 4.276E-01 1.25E-01 G

TH-234       2.4157E+00
                           63.29 2.190E+00 %(P 8.872E+00 2.65E+00 G K
                           92.80 2.404E+00  (P 2.703E+00 8.30E-01 G
                           92.38 2.772E+00  (P 3.237E+00 9.92E-01 G

AM-241       4.9693E-01
                           59.54 4.969E-01 %(P 1.186E+00 3.58E-01 G
   ( - This peak used in the nuclide activity average.

   * - Peak is too wide, but only one peak in library.
   ! - Peak is part of a multiplet and this area went
       negative during deconvolution.
   ? - Peak is too narrow.
   @ - Peak is too wide at FW25M, but ok at FWHM.
   % - Peak fails sensitivity test.
   $ - Peak identified, but first peak of this nuclide
       failed one or more qualification tests.
   + - Peak activity higher than counting uncertainty range.
   - - Peak activity lower than counting uncertainty range.
   = - Peak outside analysis energy range.
   & - Calculated peak centroid is not close enough to the
       library energy centroid for positive identification.
   P - Peakbackground subtraction
   } - Peak is too close to another for the activity
       to be found directly.

   Nuclide Codes:                      Peak Codes:
   T - Thermal Neutron Activation      G - Gamma Ray
   F - Fast Neutron Activation         X - X-Ray
   I - Fission Product                 P - Positron Decay
   N - Naturally Occurring Isotope     S - Single-Escape
   P - Photon Reaction                 D - Double-Escape
   C - Charged Particle Reaction       K - Key Line
   M - No MDA Calculation              A - Not in Average
```

R - Coincidence Corrected C - Coincidence Peak
H - Halflife limit exceeded

- -

***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	4.1034E-02	4.4520E-02	3.5424E-01	3.5425E-01	3.761E-01
K-40		1.4643E+01	1.4643E+01	1.6294E+00	1.8378E+00	
MN-54	#A	-1.1223E-03	-1.1381E-03	1.1436E-01	1.1436E-01	5.338E-02
CO-57	#B	1.2023E-02	1.2218E-02	6.1388E-02	6.1391E-02	6.739E-02
CO-60	#B	1.3630E-02	1.3661E-02	4.0288E-02	4.0296E-02	4.723E-02
Sr-85	#A	-1.7087E-02	-1.8274E-02	5.2654E-02	5.2665E-02	5.497E-02
Kr-85	#A	-3.9446E+02	-3.9448E+02	1.1367E+03	1.1369E+03	1.269E+03
Y-88	#B	-1.5284E-04	-1.5921E-04	3.9456E-03	3.9456E-03	3.973E-02
NB-94	#B	-3.8501E-03	-3.8501E-03	4.1625E-02	4.1626E-02	4.883E-02
Ag-108M	#B	1.4128E-03	1.4129E-03	7.4597E-02	7.4597E-02	8.540E-02
CD-109	#A	-4.8581E-01	-4.9050E-01	2.1731E+00	2.1732E+00	2.398E+00
SN-113	#B	1.2649E-02	1.3137E-02	6.1139E-02	6.1143E-02	6.654E-02
SB-125	#B	9.6165E-02	9.6579E-02	1.0462E-01	1.0477E-01	1.556E-01
I-131	#B	1.3661E-02	2.3479E-02	6.5041E-02	6.5055E-02	4.240E-02
CS-134	#B	3.3016E-02	3.3207E-02	1.8834E-02	1.8933E-02	5.018E-02
CS-137		3.5196E-01	3.5210E-01	9.4487E-02	9.6673E-02	
CE-139	#A	-6.1408E-04	-6.3384E-04	5.4851E-02	5.4851E-02	5.990E-02
EU-152	#B	3.4340E-02	3.4372E-02	1.7733E-01	1.7734E-01	1.977E-01
EU-154	#B	2.5903E-02	2.5940E-02	1.2060E-01	1.2061E-01	1.343E-01
EU-155	#B	1.7485E-01	1.7527E-01	2.8693E-01	2.8710E-01	3.135E-01
HG-203	#B	-1.5190E-03	-1.6678E-03	5.6765E-02	5.6765E-02	5.660E-02
TL-208		3.1878E-01	3.1878E-01	9.0848E-02	9.2714E-02	
PB-212		1.0026E+00	1.0026E+00	1.7118E-01	1.8081E-01	
PB-214		6.9248E-01	6.9248E-01	1.8327E-01	1.8763E-01	
BI-212		7.6180E-01	7.6180E-01	4.9556E-01	4.9753E-01	
BI-214		4.9330E-01	4.9330E-01	1.4009E-01	1.4299E-01	
RA-224	#A	1.0029E+00	1.0029E+00	1.3933E+00	1.3945E+00	1.518E+00
RA-226	#	1.5944E+00	1.5944E+00	1.2726E+00	1.2760E+00	
AC-228		1.0763E+00	1.0763E+00	1.8808E-01	1.9819E-01	
TH-227	#B	-2.5380E-01	-2.5380E-01	5.0071E-01	5.0092E-01	5.508E-01
PA-234	#B	-5.3864E-03	-5.3864E-03	7.4461E-01	7.4461E-01	2.931E-01
TH-234	#B	2.4157E+00	2.4157E+00	2.5012E+00	2.5048E+00	8.872E+00
AM-241	#A	4.9692E-01	4.9693E-01	1.0747E+00	1.0751E+00	1.186E+00

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.

H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (1120.0 to 2000.7 keV) 2.0935034E+01 pCi/gm
Total Decayed Activity (1120.0 to 2000.7 keV) 2.0935186E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JJM

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 103F_7SEPT2006_1008.An1

Sample description
FSS-OOL-05-03-008-F

Spectrum Filename: C:\GammaVision\Spectra\103F_7SEPT2006_1008.An1

Acquisition information
Start time: 07-Sep-2006 10:08:27
Live time: 2000
Real time: 2002
Dead time: 0.09 %
Detector ID: 4

Detector system
Det 103 - DSPE-471

Calibration
Filename: D3_1LSa.Clb
Detector_103 1.0 Liter Sand Geometry

Energy Calibration
Created: 08-Aug-2005 11:09:41
Zero offset: 0.409 keV
Gain: 0.500 keV/channel
Quadratic: 1.092E-08 keV/channel^2

Efficiency Calibration
Created: 08-Aug-2005 11:11:25
Type: Polynomial
Uncertainty: 0.993 %
Coefficients: -0.264059 -5.138468 0.638383
-0.089199 0.005011 -0.000129

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.41keV)
Stop channel: 4000 (2000.67keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 1.9530E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.9530E+03) =
5.1203E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	05-Sep-2006 07:03:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	103_150K_05AUG05.Pbc 08-Aug-2005 12:54:15
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 15 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.1542

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
74.95	84.	28.81	0.99	9.052E-03	74.81	9.600	6.685E-01	PB212
77.25	120.	19.07	0.99	1.011E-02	77.11	17.500	7.714E-01	PB212
					77.11	10.700	1.262E+00	PB214
87.26	72.	34.62	1.00	1.445E-02	86.45	32.740	1.073E-01	EU155
93.31	93.	28.47	1.00	1.665E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
186.25	119.	24.79	1.29	2.566E-02	185.99	3.280	8.741E-01	RA226
209.59	65.	37.78	1.17	2.470E-02				
238.75	810.	4.16	1.09	2.319E-02	238.63	43.100	5.525E-01	PB212
241.71	135.	17.06	1.09	2.303E-02	241.00	3.900	1.035E+00	RA224
					241.92	7.470	5.417E-01	PB214
270.13	75.	38.99	0.66	2.152E-02				
277.17	75.	32.20	1.33	2.115E-02				
295.33	225.	9.77	1.13	2.024E-02	295.22	19.200	3.925E-01	PB214
299.93	62.	28.50	1.13	2.002E-02				
338.36	210.	12.47	1.08	1.830E-02	338.40	12.010	6.583E-01	AC228
351.91	385.	8.92	1.08	1.776E-02	351.99	37.100	3.990E-01	PB214
462.58	40.	40.08	1.48	1.427E-02				
462.58	40.	40.08	1.48	1.427E-02	463.51	10.000	PBC<MDA	SB125
510.86	138.	13.34	1.51	1.317E-02	510.72	22.500	2.587E-01	TL208
583.44	327.	8.00	1.12	1.184E-02	583.14	86.000	2.191E-01	TL208
609.43	282.	9.86	1.23	1.144E-02	609.32	46.090	3.612E-01	BI214
727.78	113.	19.97	1.96	9.958E-03	727.17	11.800	6.621E-01	BI212
767.86	32.	40.57	1.04	9.557E-03				
795.36	45.	26.16	0.72	9.305E-03				
795.36	45.	26.16	0.72	9.305E-03	795.76	85.400	3.955E-02	CS134
836.10	32.	40.43	0.90	8.960E-03				

911.41	242.	10.12	1.72	8.399E-03	911.07	29.000	6.789E-01	AC228
965.25	32.	30.27	1.54	8.048E-03	964.00	14.580	PBC<MDA	EU152
969.25	103.	12.77	1.54	8.024E-03	968.90	17.460	5.101E-01	AC228
1120.62	70.	23.58	1.68	7.210E-03	1120.28	15.040	4.338E-01	BI214
1461.35	910.	3.37	1.96	5.930E-03	1460.75	10.700	9.714E+00	K40
1765.65	69.	12.04	2.11	5.139E-03	1764.51	15.920	5.556E-01	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide
418.34	209.59	269.	65.	0.032	113.34	1.170	NP-239
539.41	270.13	289.	75.	0.038	116.98	0.657	AC-228 s
553.50	277.17	219.	74.	0.037	92.28	1.327	TL-208 s
599.01	299.93	174.	75.	0.038	85.59	1.370	TH-227 s
1534.79	767.86	61.	32.	0.016	121.71	1.045	BI-214 M
1671.25	836.10	53.	32.	0.016	121.29	0.901	AC-228 l
1930.12	965.24	31.	34.	0.017	87.36	1.539	AC-228 D

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.
M - Peak is close to a library peak.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-212	148.79	74.81	274.	84.	0.042	86.43	0.993D
PB-212	153.39	77.11	305.	120.	0.060	57.21	0.995A
TH-234	185.13	92.98	727.	96.	0.048	103.02	1.500s
RA-226	371.65	186.25	373.	106.	0.053	74.37	1.288s
PB-212	476.74	238.79	682.	679.	0.340	21.70	1.020
RA-224	482.56	241.70	578.	120.	0.060	89.35	1.500
PB-214	589.81	295.33	200.	225.	0.112	34.21	1.171
AC-228	675.87	338.36	178.	209.	0.105	37.42	1.084
PB-214	702.95	351.91	254.	380.	0.190	26.75	1.078
SB-125	925.44	463.16	106.	45.	0.022	104.52	1.500s
TL-208	1020.83	510.86	106.	111.	0.055	40.01	1.505s
TL-208	1165.99	583.44	112.	323.	0.161	23.99	1.121
BI-214	1217.96	609.43	139.	275.	0.138	29.57	1.234
BI-212	1453.50	727.22	100.	104.	0.052	62.72	1.936s
CS-134	1589.40	795.17	36.	41.	0.020	77.73	1.500s
AC-228	1821.85	911.41	85.	239.	0.120	30.35	1.717s
AC-228	1936.81	968.90	34.	103.	0.052	37.85	1.541D
BI-214	2240.22	1120.62	67.	68.	0.034	70.75	1.679
K-40	2921.56	1461.35	29.	891.	0.446	10.10	1.956
BI-214	3530.06	1765.65	3.	66.	0.033	36.12	2.115s

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	Peak MDA Value pCi/gm	COMMENTS
BE-7		-5.2862E-03					
			477.56	-5.286E-03	%(	3.131E-01 9.11E-02	G
K-40		9.7140E+00					
			1460.75	9.714E+00	(P	3.027E-01 3.34E-01	G
MN-54		3.1945E-03					
			834.81	3.194E-03	%(P	2.889E-02 8.27E-03	G
CO-57		8.4456E-03					
			122.07	8.446E-03	%(P	3.976E-02 1.19E-02	G K
			136.43	-5.337E-02	%	3.416E-01 1.02E-01	G
CO-60		-2.0459E-03					
			1332.51	-2.046E-03	&(P	2.902E-02 7.56E-03	G K
			1173.23	8.926E-03	% P	3.522E-02 1.02E-02	G K
Sr-85		-1.1669E-02					
			514.00	-1.167E-02	&(	3.575E-02 1.07E-02	G
Kr-85		-2.6331E+02					
			513.99	-2.633E+02	&(	8.067E+02 2.41E+02	G
Y-88		4.0940E-03					
			1836.01	4.094E-03	&(P	2.281E-02 6.23E-03	G K
			898.02	-1.772E-03	% P	2.955E-02 8.25E-03	G
NB-94		7.4776E-03					
			871.10	7.478E-03	%(	2.227E-02 6.57E-03	G K
			702.50	2.283E-03	%	3.146E-02 9.08E-03	G K
Ag-108M		-9.2220E-03					
			722.95	-9.222E-03	&(	3.926E-02 1.16E-02	G K
			614.37	2.152E-03	% P	1.843E-02 5.18E-03	G
			433.93	-1.060E-04	%	2.672E-02 7.69E-03	G
CD-109		-5.9443E-01					
			88.04	-5.944E-01	&(	1.489E+00 4.50E-01	G
SN-113		7.2423E-03					
			391.71	7.242E-03	%(	3.385E-02 9.97E-03	G K
			255.04	-1.012E-02	%	1.111E+00 3.25E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	5.4810E-02						
		427.95	-5.751E-05	%(P	9.177E-02	2.66E-02	G K
		600.77	2.219E-02	% P	1.374E-01	3.99E-02	G
		636.15	-3.235E-03	% P	2.500E-01	7.10E-02	G
		463.51	2.172E-01	(P	2.469E-01	7.78E-02	G
		176.29	-1.355E-02	%	4.758E-01	1.41E-01	G
I-131	4.6508E-03						
		364.48	4.651E-03	&(P	3.398E-02	9.95E-03	G K
		636.97	3.636E-02	&	4.241E-01	1.22E-01	G
		284.29	-6.643E-02	% P	5.458E-01	1.61E-01	G
CS-134	1.6654E-02						
		604.66	7.479E-05	&(	3.269E-02	9.42E-03	G K
		795.76	3.560E-02	(P	2.668E-02	9.24E-03	G
		569.29	-1.158E-02	% P	1.926E-01	5.52E-02	G
		801.84	-1.711E-02	& P	3.538E-01	9.92E-02	G
CS-137	1.6473E-02						
		661.62	1.647E-02	%(P	3.466E-02	1.05E-02	G
CE-139	-1.5279E-03						
		165.85	-1.528E-03	&(	4.095E-02	1.22E-02	G
EU-152	2.4113E-02						
		121.78	2.411E-02	%(P	1.161E-01	3.47E-02	G K
		344.30	-2.002E-04	% P	1.013E-01	2.96E-02	G
		1408.08	-3.523E-02	%	1.405E-01	4.06E-02	G
		964.00	9.648E-03	% P	3.742E-01	1.09E-01	G
		1112.07	6.248E-02	%	2.305E-01	6.75E-02	G
		778.90	-2.639E-02	%	1.981E-01	5.68E-02	G
EU-154	-1.1276E-04						
		123.10	-1.128E-04	%(	8.809E-02	2.61E-02	G K
		1274.80	-7.105E-03	%	9.857E-02	2.79E-02	G
		723.30	-4.360E-02	%	1.972E-01	5.83E-02	G
		1004.80	-2.832E-02	&	1.787E-01	5.15E-02	G
EU-155	-1.1174E-02						
		86.45	-1.117E-02	%(	2.062E-01	6.15E-02	G K
		105.31	7.634E-02	%	1.957E-01	5.91E-02	G
HG-203	4.2710E-04						
		279.17	4.271E-04	&(P	3.727E-02	1.10E-02	G K
		72.87	-7.960E-01	& P	1.894E+00	5.73E-01	G
		70.83	-9.270E-01	%	3.492E+00	1.05E+00	G
		82.50	-4.066E-02	&	3.339E+00	9.93E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	2.2734E-01						
		583.14	2.191E-01	(P	3.540E-02	1.78E-02	G
		510.72	2.587E-01	*(P	1.184E-01	4.28E-02	G
PB-212	4.7005E-01						
		238.63	4.700E-01	(P	8.608E-02	3.46E-02	G K
							Energy duplication
		77.11	4.700E-01	} P	3.286E-01	8.96E-02	G
		74.81	6.685E-01	+ P	6.358E-01	2.00E-01	G
PB-214	3.9926E-01						
		351.99	3.990E-01	(P	8.091E-02	3.61E-02	G K
		295.22	3.998E-01	(P	1.222E-01	4.64E-02	G
							Energy duplication
		77.11	3.993E-01	} P	8.239E-01	1.96E-01	G
		241.92	3.248E-01	%	4.827E-01	1.48E-01	G
BI-212	6.0968E-01						
		727.17	6.097E-01	*(P	2.907E-01	1.28E-01	G K
		1620.56	6.622E-02	% P	8.131E-01	2.16E-01	G
		785.42	-1.534E-02	%	1.630E+00	4.65E-01	G
BI-214	3.7908E-01						
		609.32	3.612E-01	(P	7.560E-02	3.65E-02	G K
		1764.51	5.556E-01	+ P	9.416E-02	7.03E-02	G
		1120.28	4.338E-01	(P	2.606E-01	1.05E-01	G
RA-224	9.2269E-01						
		241.00	9.227E-01	(	8.827E-01	2.75E-01	G
RA-226	8.7407E-01						
		185.99	8.741E-01	(P	7.617E-01	2.43E-01	G
AC-228	6.7284E-01						
		911.07	6.789E-01	@(P	1.297E-01	6.97E-02	G K
		968.90	5.103E-01	- P	1.469E-01	6.45E-02	G
		338.40	6.583E-01	(P	2.042E-01	8.25E-02	G
TH-227	-3.5962E-02						
		236.00	-3.596E-02	%(	3.013E-01	8.98E-02	G K
		256.25	-4.505E-02	% P	3.868E-01	1.15E-01	G
PA-234	-7.2849E-02						
		98.44	-7.285E-02	&(P	1.829E-01	5.52E-02	G K
		946.00	-1.243E-02	& P	1.663E-01	4.75E-02	G
		131.28	-3.869E-02	% P	1.837E-01	5.50E-02	G
		94.67	4.673E-03	% P	3.319E-01	9.86E-02	G
		883.24	-4.363E-02	%	2.532E-01	7.34E-02	G
		926.70	-1.262E-02	%	2.208E-01	6.16E-02	G

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 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26-5.214E-02 % P 2.779E-01 8.06E-02 G

TH-234       4.5203E-01
                           63.29-2.390E-01 &(P 5.641E+00 1.67E+00 G K
                           92.80 1.350E+00 *(P 1.799E+00 5.49E-01 G
                           92.38 1.519E+00 % P 2.159E+00 6.57E-01 G

AM-241       3.4401E-02
                           59.54 3.440E-02 &(P 9.609E-01 2.85E-01 G
   ( - This peak used in the nuclide activity average.

   * - Peak is too wide, but only one peak in library.
   ! - Peak is part of a multiplet and this area went
       negative during deconvolution.
   ? - Peak is too narrow.
   @ - Peak is too wide at FW25M, but ok at FWHM.
   % - Peak fails sensitivity test.
   $ - Peak identified, but first peak of this nuclide
       failed one or more qualification tests.
   + - Peak activity higher than counting uncertainty range.
   - - Peak activity lower than counting uncertainty range.
   = - Peak outside analysis energy range.
   & - Calculated peak centroid is not close enough to the
       library energy centroid for positive identification.
   P - Peakbackground subtraction
   } - Peak is too close to another for the activity
       to be found directly.

   Nuclide Codes:                      Peak Codes:
   T - Thermal Neutron Activation      G - Gamma Ray
   F - Fast Neutron Activation         X - X-Ray
   I - Fission Product                 P - Positron Decay
   N - Naturally Occurring Isotope     S - Single-Escape
   P - Photon Reaction                 D - Double-Escape
   C - Charged Particle Reaction       K - Key Line
   M - No MDA Calculation              A - Not in Average
   R - Coincidence Corrected           C - Coincidence Peak
   H - Halflife limit exceeded

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
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***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	-5.1421E-03	-5.2862E-03	2.7323E-01	2.7323E-01	3.046E-01
K-40		9.7140E+00	9.7140E+00	1.0013E+00	1.1492E+00	
MN-54	#A	3.1794E-03	3.1945E-03	2.4808E-02	2.4809E-02	2.876E-02
CO-57	#B	8.3996E-03	8.4456E-03	3.5711E-02	3.5714E-02	3.955E-02
CO-60	#B	-2.0443E-03	-2.0459E-03	1.3305E-01	1.3305E-01	2.900E-02

Sr-85	#A	-1.1406E-02	-1.1669E-02	3.2109E-02	3.2116E-02	3.495E-02
Kr-85	#A	-2.6330E+02	-2.6331E+02	7.2449E+02	7.2465E+02	8.067E+02
Y-88	#B	4.0378E-03	4.0940E-03	1.8689E-02	1.8690E-02	2.249E-02
NB-94	#B	7.4776E-03	7.4776E-03	1.9716E-02	1.9721E-02	2.227E-02
Ag-108M	#B	-9.2217E-03	-9.2220E-03	3.4780E-02	3.4784E-02	3.926E-02
CD-109	#A	-5.9249E-01	-5.9443E-01	1.3495E+00	1.3499E+00	1.484E+00
SN-113	#B	7.1501E-03	7.2423E-03	2.9904E-02	2.9907E-02	3.342E-02
SB-125	#B	5.4730E-02	5.4810E-02	5.8921E-02	5.9007E-02	9.164E-02
I-131	#B	3.8710E-03	4.6508E-03	2.9853E-02	2.9854E-02	2.828E-02
CS-134	#B	1.6621E-02	1.6654E-02	1.2973E-02	1.3009E-02	3.263E-02
CS-137	#A	1.6471E-02	1.6473E-02	3.1407E-02	3.1421E-02	3.466E-02
CE-139	#A	-1.5116E-03	-1.5279E-03	3.6514E-02	3.6514E-02	4.051E-02
EU-152	#B	2.4105E-02	2.4113E-02	1.0420E-01	1.0420E-01	1.160E-01
EU-154	#B	-1.1270E-04	-1.1276E-04	7.8421E-02	7.8421E-02	8.805E-02
EU-155	#B	-1.1165E-02	-1.1174E-02	1.8445E-01	1.8445E-01	2.060E-01
HG-203	#B	4.1379E-04	4.2710E-04	3.2929E-02	3.2929E-02	3.611E-02
TL-208		2.2734E-01	2.2734E-01	5.5278E-02	5.6832E-02	
PB-212		4.7005E-01	4.7005E-01	1.0380E-01	1.0732E-01	
PB-214		3.9926E-01	3.9926E-01	8.8154E-02	9.1151E-02	
BI-212	#	6.0968E-01	6.0968E-01	3.8424E-01	3.8587E-01	
BI-214		3.7908E-01	3.7908E-01	1.1475E-01	1.1684E-01	
RA-224	#	9.2269E-01	9.2269E-01	8.2440E-01	8.2614E-01	8.827E-01
RA-226		8.7407E-01	8.7407E-01	7.2924E-01	7.3100E-01	
AC-228		6.7284E-01	6.7284E-01	1.6352E-01	1.6812E-01	
TH-227	#B	-3.5962E-02	-3.5962E-02	2.6935E-01	2.6935E-01	3.013E-01
PA-234	#B	-7.2849E-02	-7.2849E-02	1.7257E-01	1.7262E-01	1.829E-01
TH-234	#B	4.5203E-01	4.5203E-01	5.5104E-01	5.5161E-01	5.641E+00
AM-241	#A	3.4400E-02	3.4401E-02	8.5543E-01	8.5544E-01	9.609E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (1120.0 to 2000.7 keV) 1.3346284E+01 pCi/gm
Total Decayed Activity (1120.0 to 2000.7 keV) 1.3346286E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JPK

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 103F_7SEPT2006_1047.An1

Sample description
FSS-OOL-05-03-007-F

Spectrum Filename: C:\GammaVision\Spectra\103F_7SEPT2006_1047.An1

Acquisition information
Start time: 07-Sep-2006 10:47:33
Live time: 2000
Real time: 2001
Dead time: 0.07 %
Detector ID: 4

Detector system
Det 103 - DSPE-471

Calibration
Filename: D3_1LSa.Clb
Detector_103 1.0 Liter Sand Geometry

Energy Calibration
Created: 08-Aug-2005 11:09:41
Zero offset: 0.409 keV
Gain: 0.500 keV/channel
Quadratic: 1.092E-08 keV/channel^2

Efficiency Calibration
Created: 08-Aug-2005 11:11:25
Type: Polynomial
Uncertainty: 0.993 %
Coefficients: -0.264059 -5.138468 0.638383
-0.089199 0.005011 -0.000129

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.41keV)
Stop channel: 4000 (2000.67keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 1.0390E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.0390E+03) =
9.6246E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	01-Sep-2006 08:05:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	103_150K_05AUG05.Pbc 08-Aug-2005 12:54:15
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 15 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.1691

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
74.90	77.	26.46	0.99	9.052E-03	74.81	9.600	1.145E+00	PB212
77.20	86.	21.64	0.99	1.011E-02	77.11	17.500	8.693E-01	PB212
					77.11	10.700	1.422E+00	PB214
93.50	81.	33.31	1.99	1.669E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
186.22	106.	26.81	1.27	2.566E-02	185.99	3.280	PBC<MDA	RA226
209.46	76.	39.77	1.00	2.471E-02				
238.78	639.	4.63	1.09	2.319E-02	238.63	43.100	8.161E-01	PB212
241.41	85.	28.09	1.09	2.305E-02	241.00	3.900	1.225E+00	RA224
					241.92	7.470	6.412E-01	PB214
270.20	72.	31.84	1.10	2.151E-02				
295.25	176.	13.34	1.04	2.025E-02	295.22	19.200	5.739E-01	PB214
338.56	161.	14.92	1.09	1.829E-02	338.40	12.010	9.480E-01	AC228
352.12	264.	9.33	1.01	1.775E-02	351.99	37.100	5.112E-01	PB214
463.19	35.	37.64	1.06	1.425E-02				
463.19	35.	37.64	1.06	1.425E-02	463.51	10.000	PBC<MDA	SB125
510.96	151.	14.08	1.75	1.317E-02	510.72	22.500	5.473E-01	TL208
563.14	40.	32.21	1.48	1.218E-02				
583.29	206.	10.00	1.50	1.184E-02	583.14	86.000	2.570E-01	TL208
609.47	201.	10.34	1.30	1.144E-02	609.32	46.090	4.804E-01	BI214
661.96	295.	7.20	1.17	1.072E-02	661.62	84.620	4.213E-01	CS137
727.84	48.	26.46	1.58	9.958E-03	727.17	11.800	5.310E-01	BI212
795.48	26.	40.21	1.50	9.301E-03	795.76	85.400	PBC<MDA	CS134
911.48	144.	10.34	1.13	8.398E-03	911.07	29.000	7.513E-01	AC228
968.99	136.	14.26	1.44	8.025E-03	968.90	17.460	1.265E+00	AC228
1120.61	97.	16.74	1.41	7.210E-03	1120.28	15.040	1.137E+00	BI214
1461.29	809.	3.55	1.50	5.930E-03	1460.75	10.700	1.619E+01	K40

1765.03	39.	16.75	1.24	5.141E-03	1764.51	15.920	5.740E-01	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
418.08	209.46	314.	76.	0.038	119.31	0.998	AC-228	s
539.56	270.20	189.	72.	0.036	95.52	1.095	AC-228	s
925.51	463.19	66.	35.	0.018	112.93	1.062	AC-228	l
1125.38	563.14	50.	40.	0.020	87.74	1.483	CS-134	

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-212	148.79	74.81	185.	77.	0.038	79.38	0.993D
PB-212	153.39	77.11	205.	86.	0.043	64.92	0.995A
TH-234	185.73	93.28	513.	86.	0.043	95.82	1.500s
TH-234	185.69	93.26	505.	84.	0.042	97.03	1.500s
RA-226	371.76	186.30	377.	95.	0.047	80.57	1.500s
PB-212	476.74	238.79	397.	571.	0.285	20.25	1.003
RA-224	482.59	241.71	417.	79.	0.040	114.74	1.500s
PB-214	589.66	295.25	159.	172.	0.086	40.01	1.037
AC-228	676.27	338.56	156.	160.	0.080	44.75	1.090s
PB-214	703.38	352.12	133.	259.	0.129	27.98	1.007s
TL-208	1021.03	510.96	121.	125.	0.062	42.23	1.751s
TL-208	1165.68	583.29	82.	201.	0.101	29.99	1.496
BI-214	1218.03	609.47	86.	195.	0.097	31.01	1.299s
CS-137	1323.01	661.96	57.	294.	0.147	21.59	1.174
BI-212	1454.75	727.84	47.	48.	0.024	79.39	1.584s
CS-134	1590.02	795.48	41.	26.	0.013	120.63	1.500s
AC-228	1821.98	911.48	32.	141.	0.070	31.03	1.134s
AC-228	1936.99	968.99	58.	136.	0.068	42.78	1.440
BI-214	2240.20	1120.61	42.	95.	0.047	50.21	1.411
K-40	2921.44	1461.29	22.	790.	0.395	10.64	1.499
BI-214	3528.82	1765.03	5.	36.	0.018	50.25	1.242s

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	Peak MDA Value pCi/gm	COMMENTS
BE-7		1.0005E-01					
			477.56	1.000E-01	&(	5.046E-01 1.48E-01	G
K-40		1.6190E+01					
			1460.75	1.619E+01	(P	5.026E-01 5.88E-01	G
MN-54		-5.2592E-04					
			834.81	-5.259E-04	%(P	6.302E-02 1.79E-02	G
CO-57		5.0093E-03					
			122.07	5.009E-03	&(P	6.332E-02 1.88E-02	G K
			136.43	-1.145E-01	&	5.092E-01 1.52E-01	G
CO-60		-5.4346E-03					
			1332.51	-5.435E-03	%(P	5.500E-02 1.42E-02	G K
			1173.23	-2.974E-03	% P	6.549E-02 1.80E-02	G K
Sr-85		-1.3748E-02					
			514.00	-1.375E-02	%(	6.278E-02 1.86E-02	G
Kr-85		-2.9681E+02					
			513.99	-2.968E+02	%(	1.358E+03 4.02E+02	G
Y-88		3.3838E-03					
			1836.01	3.384E-03	%(P	3.489E-02 8.85E-03	G K
			898.02	-7.772E-03	& P	5.461E-02 1.54E-02	G
NB-94		2.1296E-03					
			871.10	2.130E-03	&(	5.173E-02 1.46E-02	G K
			702.50	-3.035E-03	&	4.436E-02 1.26E-02	G K
Ag-108M		0.0000E+00					
			722.95	0.000E+00	%(	8.291E-02 2.40E-02	G K
			614.37	-1.948E-02	% P	6.098E-02 1.81E-02	G
			433.93	0.000E+00	%	5.187E-02 1.50E-02	G
CD-109		1.6588E+00					
			88.04	1.659E+00	%(	2.406E+00 7.38E-01	G
SN-113		-1.2571E-02					
			391.71	-1.257E-02	%(	7.891E-02 2.32E-02	G K
			255.04	1.477E-01	%	1.982E+00 5.81E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	6.5000E-02						
		427.95	6.500E-02	&(P	1.075E-01	3.32E-02	G K
		600.77	-1.954E-04	% P	2.692E-01	7.67E-02	G
		636.15	6.373E-02	% P	4.163E-01	1.20E-01	G
		463.51	2.368E-01	% P	4.618E-01	1.40E-01	G
		176.29	4.560E-02	%	7.406E-01	2.19E-01	G
I-131	-1.1139E-02						
		364.48	-1.114E-02	&(P	9.144E-02	2.67E-02	G K
		636.97	2.255E-01	&	7.049E-01	2.07E-01	G
		284.29	-2.029E-01	& P	1.234E+00	3.65E-01	G
CS-134	1.2558E-02						
		604.66	-1.338E-02	%(	6.088E-02	1.80E-02	G K
		795.76	4.220E-02	(P	5.340E-02	1.70E-02	G
		569.29	-1.186E-02	& P	3.236E-01	9.15E-02	G
		801.84	-3.521E-02	% P	4.488E-01	1.20E-01	G
CS-137	4.2134E-01						
		661.62	4.213E-01	(P	5.442E-02	3.05E-02	G
CE-139	6.3143E-05						
		165.85	6.314E-05	&(	6.138E-02	1.81E-02	G
EU-152	1.9439E-02						
		121.78	1.944E-02	&(P	1.824E-01	5.41E-02	G K
		344.30	9.795E-03	& P	1.717E-01	5.02E-02	G
		1408.08	5.700E-02	%	2.265E-01	6.50E-02	G
		964.00	1.948E-01	% P	3.764E-01	1.15E-01	G
		1112.07	1.275E-01	&	3.668E-01	1.09E-01	G
		778.90	-1.093E-01	%	3.962E-01	1.17E-01	G
EU-154	-7.2945E-03						
		123.10	-7.295E-03	&(	1.358E-01	4.02E-02	G K
		1274.80	0.000E+00	&	2.023E-01	5.68E-02	G
		723.30	7.033E-03	%	4.103E-01	1.19E-01	G
		1004.80	-3.056E-02	&	3.124E-01	8.87E-02	G
EU-155	1.7678E-01						
		86.45	1.768E-01	%(	3.033E-01	9.24E-02	G K
		105.31	3.919E-02	&	2.948E-01	8.77E-02	G
HG-203	1.1153E-03						
		279.17	1.115E-03	&(P	6.138E-02	1.80E-02	G K
		72.87	-1.277E+00	& P	3.338E+00	1.01E+00	G
		70.83	-2.684E+00	&	5.992E+00	1.81E+00	G
		82.50	-1.036E+00	%	5.565E+00	1.66E+00	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments

TL-208       2.5702E-01
                          583.14 2.570E-01  (P 5.724E-02 2.62E-02 G
                          510.72 5.473E-01 + P 2.371E-01 9.36E-02 G

PB-212       7.7886E-01
                          238.63 7.422E-01  (P 1.244E-01 5.11E-02 G K
                                                          Energy duplication
                           77.11 6.333E-01 } P 5.098E-01 1.37E-01 G
                           74.81 1.145E+00 + P 9.899E-01 3.15E-01 G

PB-214       5.3257E-01
                          351.99 5.112E-01 @(P 1.115E-01 4.87E-02 G K
                          295.22 5.739E-01  (P 2.059E-01 7.84E-02 G
                                                          Energy duplication
                           77.11 2.515E-01 } P 1.178E+00 3.18E-01 G
                          241.92 3.468E-01 %   7.824E-01 2.37E-01 G

BI-212       5.3100E-01
                          727.17 5.310E-01 *(P 3.833E-01 1.42E-01 G K
                         1620.56-3.847E-03 & P 2.434E+00 6.67E-01 G
                          785.42 6.973E-01 %   1.865E+00 5.54E-01 G

BI-214       5.0442E-01
                          609.32 4.804E-01  (P 1.135E-01 5.13E-02 G K
                         1764.51 5.740E-01  (P 2.065E-01 1.05E-01 G
                         1120.28 1.137E+00 + P 3.955E-01 1.94E-01 G

RA-224       1.1421E+00
                          241.00 1.142E+00  (  1.415E+00 4.37E-01 G

RA-226       1.4631E+00
                          185.99 1.463E+00  (P 1.440E+00 4.47E-01 G

AC-228       8.0890E-01
                          911.07 7.513E-01 @(P 1.558E-01 7.96E-02 G K
                          968.90 1.265E+00 + P 3.538E-01 1.81E-01 G
                          338.40 9.480E-01 *(P 3.602E-01 1.42E-01 G

TH-227      -1.6999E-01
                          236.00-1.700E-01 %(  4.968E-01 1.50E-01 G K
                          256.25 3.955E-02 & P 6.207E-01 1.82E-01 G

PA-234       4.1731E-02
                           98.44 4.173E-02 %(P 2.749E-01 8.18E-02 G K
                          946.00 2.481E-02 & P 2.481E-01 7.02E-02 G
                          131.28-4.791E-02 & P 2.823E-01 8.42E-02 G
                           94.67-2.207E-01 % P 5.716E-01 1.73E-01 G
                          883.24-3.576E-03 &   3.095E-01 8.38E-02 G
                          926.70-1.668E-02 %   4.279E-01 1.19E-01 G
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 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26-1.750E-02 & P 4.775E-01 1.35E-01 G

TH-234       2.2505E+00
                           63.29 2.007E+00 %(P 8.449E+00 2.52E+00 G K
                           92.80 2.209E+00 *(P 2.832E+00 8.65E-01 G
                           92.38 2.669E+00 &(P 3.362E+00 1.03E+00 G

AM-241      -1.3634E-01
                           59.54-1.363E-01 %(P 1.473E+00 4.36E-01 G
   ( - This peak used in the nuclide activity average.

   * - Peak is too wide, but only one peak in library.
   ! - Peak is part of a multiplet and this area went
       negative during deconvolution.
   ? - Peak is too narrow.
   @ - Peak is too wide at FW25M, but ok at FWHM.
   % - Peak fails sensitivity test.
   $ - Peak identified, but first peak of this nuclide
       failed one or more qualification tests.
   + - Peak activity higher than counting uncertainty range.
   - - Peak activity lower than counting uncertainty range.
   = - Peak outside analysis energy range.
   & - Calculated peak centroid is not close enough to the
       library energy centroid for positive identification.
   P - Peakbackground subtraction
   } - Peak is too close to another for the activity
       to be found directly.

   Nuclide Codes:                      Peak Codes:
   T - Thermal Neutron Activation      G - Gamma Ray
   F - Fast Neutron Activation         X - X-Ray
   I - Fission Product                 P - Positron Decay
   N - Naturally Occurring Isotope     S - Single-Escape
   P - Photon Reaction                 D - Double-Escape
   C - Charged Particle Reaction       K - Key Line
   M - No MDA Calculation              A - Not in Average
   R - Coincidence Corrected           C - Coincidence Peak
   H - Halflife limit exceeded

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
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***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	9.2418E-02	1.0005E-01	4.4523E-01	4.4527E-01	4.661E-01
K-40		1.6190E+01	1.6190E+01	1.7627E+00	1.9977E+00	
MN-54	#A	-5.1883E-04	-5.2592E-04	3.8368E-02	3.8368E-02	6.218E-02
CO-57	#B	4.9313E-03	5.0093E-03	5.6279E-02	5.6280E-02	6.234E-02
CO-60	#B	-5.4226E-03	-5.4346E-03	2.2614E-01	2.2614E-01	5.488E-02

Sr-85	#A	-1.2879E-02	-1.3748E-02	5.5718E-02	5.5723E-02	5.880E-02
Kr-85	#A	-2.9679E+02	-2.9681E+02	1.2049E+03	1.2050E+03	1.357E+03
Y-88	#B	3.2519E-03	3.3838E-03	2.6554E-02	2.6555E-02	3.353E-02
NB-94	#B	2.1296E-03	2.1296E-03	4.3732E-02	4.3733E-02	5.173E-02
Ag-108M	#B	0.0000E+00	0.0000E+00	7.1944E-02	7.1944E-02	8.290E-02
CD-109	#A	1.6434E+00	1.6588E+00	2.2131E+00	2.2150E+00	2.383E+00
SN-113	#B	-1.2116E-02	-1.2571E-02	6.9712E-02	6.9716E-02	7.605E-02
SB-125	#B	6.4728E-02	6.5000E-02	9.9656E-02	9.9727E-02	1.071E-01
I-131	#B	-6.5759E-03	-1.1139E-02	9.7169E-02	9.7172E-02	5.398E-02
CS-134	#B	1.2487E-02	1.2558E-02	1.5200E-02	1.5217E-02	6.054E-02
CS-137		4.2118E-01	4.2134E-01	9.1408E-02	9.4625E-02	
CE-139	#A	6.1227E-05	6.3143E-05	5.4294E-02	5.4294E-02	5.951E-02
EU-152	#B	1.9421E-02	1.9439E-02	1.6228E-01	1.6229E-01	1.822E-01
EU-154	#B	-7.2846E-03	-7.2945E-03	1.2061E-01	1.2061E-01	1.356E-01
EU-155	#B	1.7637E-01	1.7678E-01	2.7735E-01	2.7752E-01	3.025E-01
HG-203	#B	1.0184E-03	1.1153E-03	5.3907E-02	5.3907E-02	5.604E-02
TL-208		2.5702E-01	2.5702E-01	7.8717E-02	8.0119E-02	
PB-212		7.7886E-01	7.7886E-01	1.6104E-01	1.6727E-01	
PB-214		5.3257E-01	5.3257E-01	1.3302E-01	1.3656E-01	
BI-212	#	5.3100E-01	5.3100E-01	4.2593E-01	4.2704E-01	
BI-214		5.0442E-01	5.0442E-01	1.6012E-01	1.6277E-01	
RA-224	#A	1.1421E+00	1.1421E+00	1.3105E+00	1.3122E+00	1.415E+00
RA-226	#	1.4631E+00	1.4631E+00	1.3402E+00	1.3428E+00	1.440E+00
AC-228		8.0890E-01	8.0890E-01	2.2299E-01	2.2788E-01	
TH-227	#B	-1.6999E-01	-1.6999E-01	4.4858E-01	4.4868E-01	4.968E-01
PA-234	#B	4.1731E-02	4.1731E-02	2.4533E-01	2.4534E-01	2.749E-01
TH-234	#B	2.2505E+00	2.2505E+00	2.5988E+00	2.6018E+00	8.449E+00
AM-241	#A	-1.3633E-01	-1.3634E-01	1.3710E+00	1.3710E+00	1.473E+00

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (86.9 to 2000.7 keV) 2.0023621E+01 pCi/gm
Total Decayed Activity (86.9 to 2000.7 keV) 2.0023783E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JPK

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 103F_7SEPT2006_1145.An1

Sample description
FSS-OOL-05-03-017-F

Spectrum Filename: C:\GammaVision\Spectra\103F_7SEPT2006_1145.An1

Acquisition information
Start time: 07-Sep-2006 11:45:01
Live time: 2000
Real time: 2002
Dead time: 0.08 %
Detector ID: 4

Detector system
Det 103 - DSPE-471

Calibration
Filename: D3_1LSa.Clb
Detector_103 1.0 Liter Sand Geometry

Energy Calibration
Created: 08-Aug-2005 11:09:41
Zero offset: 0.409 keV
Gain: 0.500 keV/channel
Quadratic: 1.092E-08 keV/channel^2

Efficiency Calibration
Created: 08-Aug-2005 11:11:25
Type: Polynomial
Uncertainty: 0.993 %
Coefficients: -0.264059 -5.138468 0.638383
-0.089199 0.005011 -0.000129

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.41keV)
Stop channel: 4000 (2000.67keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 1.5650E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.5650E+03) =
6.3898E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	01-Sep-2004 08:40:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	103_150K_05AUG05.Pbc 08-Aug-2005 12:54:15
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 17 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.2400

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
74.84	96.	23.82	0.99	9.052E-03	74.81	9.600	9.570E-01	PB212
77.14	126.	16.80	0.99	1.011E-02	77.11	17.500	7.795E-01	PB212
92.98	74.	40.77	1.50	1.631E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
186.40	151.	20.11	1.17	2.565E-02	185.99	3.280	1.420E+00	RA226
209.44	110.	29.60	1.12	2.471E-02				
238.77	756.	4.29	1.09	2.320E-02	238.63	43.100	6.422E-01	PB212
241.80	92.	22.37	1.09	2.303E-02	241.00	3.900	8.814E-01	RA224
					241.92	7.470	4.612E-01	PB214
270.36	78.	27.91	1.98	2.150E-02				
295.46	179.	11.66	0.93	2.024E-02	295.22	19.200	3.883E-01	PB214
300.79	59.	32.70	1.29	1.998E-02				
338.51	128.	15.10	1.04	1.830E-02	338.40	12.010	4.997E-01	AC228
352.02	325.	9.32	1.04	1.775E-02	351.99	37.100	4.186E-01	PB214
463.32	36.	36.04	1.28	1.425E-02				
463.32	36.	36.04	1.28	1.425E-02	463.51	10.000	PBC<MDA	SB125
510.83	146.	15.82	1.76	1.317E-02	510.72	22.500	3.476E-01	TL208
583.28	271.	8.36	1.52	1.184E-02	583.14	86.000	2.264E-01	TL208
609.57	249.	7.93	1.23	1.144E-02	609.32	46.090	3.970E-01	BI214
662.09	59.	28.75	2.65	1.072E-02	661.62	84.620	5.863E-02	CS137
727.12	67.	24.83	1.54	9.965E-03	727.17	11.800	4.869E-01	BI212
795.68	28.	37.38	1.50	9.301E-03	795.76	85.400	PBC<MDA	CS134
911.42	180.	9.42	1.27	8.399E-03	911.07	29.000	6.274E-01	AC228
965.28	32.	30.02	1.54	8.056E-03	964.00	14.580	2.645E-01	EU152
969.02	141.	16.32	1.50	8.025E-03	968.90	17.460	8.692E-01	AC228
1121.46	81.	17.91	1.99	7.206E-03	1120.28	15.040	6.290E-01	BI214
1461.40	965.	3.28	1.80	5.930E-03	1460.75	10.700	1.287E+01	K40

1621.22	19.	29.30	0.96	5.488E-03	1620.56	2.750	1.085E+00	BI212
1765.64	43.	15.88	1.82	5.142E-03	1764.51	15.920	4.571E-01	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
418.04	209.44	376.	110.	0.055	88.81	1.123	AC-228	s
539.87	270.36	180.	78.	0.039	83.74	1.975	AC-228	s
600.73	300.79	135.	59.	0.029	98.11	1.287	PB-212	s
925.77	463.32	64.	36.	0.018	108.11	1.282	SB-125	l

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-212	148.79	74.81	234.	96.	0.048	71.45	0.993D
PB-212	153.39	77.11	220.	126.	0.063	50.40	0.995A
RA-226	371.96	186.40	350.	138.	0.069	60.33	1.173
PB-212	476.78	238.81	403.	714.	0.357	16.85	1.084
RA-224	482.70	241.77	475.	81.	0.041	118.84	1.500
PB-214	590.07	295.46	126.	175.	0.087	34.99	0.925
AC-228	676.16	338.51	119.	127.	0.064	45.31	1.045
PB-214	703.17	352.02	197.	319.	0.160	27.97	1.044
TL-208	1020.78	510.83	148.	119.	0.060	47.45	1.762s
TL-208	1165.67	583.28	78.	267.	0.134	25.07	1.522s
BI-214	1218.23	609.57	68.	242.	0.121	23.79	1.231
CS-137	1323.26	662.09	76.	59.	0.029	86.25	2.648s
BI-212	1453.31	727.12	68.	66.	0.033	74.49	1.538s
CS-134	1590.42	795.68	42.	28.	0.014	112.14	1.500s
AC-228	1821.86	911.42	45.	177.	0.089	28.25	1.269
EU-152	1929.58	965.28	33.	32.	0.016	90.05	1.538
AC-228	1937.04	969.01	72.	131.	0.065	44.39	1.491
BI-214	2241.90	1121.46	41.	79.	0.040	53.73	1.987s
K-40	2921.67	1461.40	28.	946.	0.473	9.84	1.797
BI-212	3241.25	1621.22	3.	19.	0.009	87.91	0.963s
BI-214	3530.04	1765.64	6.	43.	0.022	47.64	1.817

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	MDA Value pCi/gm	COMMENTS
BE-7		0.0000E+00					
			477.56	0.000E+00	&(	0.000E+00	0.00E+00 G
K-40		1.2873E+01					
			1460.75	1.287E+01	(P	3.706E-01	4.31E-01 G
MN-54		6.8119E-02					
			834.81	6.812E-02	%(P	1.677E-01	5.02E-02 G
CO-57		8.3537E-02					
			122.07	8.354E-02	%(P	3.077E-01	9.23E-02 G K
			136.43	-1.749E-02	%	2.076E+00	6.13E-01 G
CO-60		-1.6096E-03					
			1332.51	-1.610E-03	&(P	4.736E-02	1.25E-02 G K
			1173.23	-4.097E-03	% P	5.489E-02	1.50E-02 G K
Sr-85		-3.3993E+01					
			514.00	-3.399E+01	%(	1.091E+02	3.26E+01 G
Kr-85		-3.0164E+02					
			513.99	-3.016E+02	%(	9.684E+02	2.89E+02 G
Y-88		7.2117E-02					
			1836.01	7.212E-02	%(P	2.583E+00	6.22E-01 G K
			898.02	7.405E-01	& P	4.892E+00	1.41E+00 G
NB-94		2.8577E-03					
			871.10	2.858E-03	%(	3.307E-02	9.37E-03 G K
			702.50	1.955E-03	&	3.557E-02	1.02E-02 G K
Ag-108M		2.9460E-04					
			722.95	2.946E-04	&(	4.569E-02	1.31E-02 G K
			614.37	-1.270E-03	% P	4.064E-02	1.17E-02 G
			433.93	2.702E-03	%	3.588E-02	1.04E-02 G
CD-109		-2.1456E-02					
			88.04	-2.146E-02	%(	5.866E+00	1.74E+00 G
SN-113		4.5957E-01					
			391.71	4.596E-01	%(	3.683E+00	1.08E+00 G K
			255.04	2.517E+01	%	1.299E+02	3.86E+01 G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	7.1182E-02						
		427.95	7.118E-02	%(P	1.563E-01	4.73E-02	G K
		600.77	9.333E-02	% P	2.834E-01	8.43E-02	G
		636.15	-1.959E-01	% P	6.019E-01	1.79E-01	G
		463.51	3.352E-01	% P	4.968E-01	1.53E-01	G
		176.29	1.572E-01	%	9.125E-01	2.72E-01	G
I-131	0.0000E+00						
		364.48	0.000E+00	&(P	0.000E+00	0.00E+00	G K
		636.97	0.000E+00	%	0.000E+00	0.00E+00	G
		284.29	0.000E+00	& P	0.000E+00	0.00E+00	G
CS-134	2.9954E-02						
		604.66	3.222E-03	&(	1.293E-01	3.81E-02	G K
		795.76	6.050E-02	*(P	7.050E-02	2.27E-02	G
		569.29	-7.686E-02	% P	4.397E-01	1.27E-01	G
		801.84	2.679E-02	% P	5.425E-01	1.47E-01	G
CS-137	5.8630E-02						
		661.62	5.863E-02	(P	4.325E-02	1.73E-02	G
CE-139	1.7745E-01						
		165.85	1.775E-01	%(	1.861E+00	5.53E-01	G
EU-152	1.1509E-01						
		121.78	4.058E-02	%(P	1.523E-01	4.57E-02	G K
		344.30	4.156E-02	% P	1.185E-01	3.55E-02	G
		1408.08	2.519E-02	%	1.507E-01	4.19E-02	G
		964.00	2.645E-01	(P	2.404E-01	8.07E-02	G
		1112.07	8.549E-02	%	2.900E-01	8.50E-02	G
		778.90	-2.287E-02	&	3.440E-01	9.89E-02	G
EU-154	-1.3644E-02						
		123.10	-1.364E-02	&(	1.217E-01	3.63E-02	G K
		1274.80	-2.618E-02	%	1.642E-01	4.75E-02	G
		723.30	-6.692E-02	&	2.841E-01	8.40E-02	G
		1004.80	-4.478E-03	&	2.503E-01	7.01E-02	G
EU-155	6.5793E-03						
		86.45	6.579E-03	%(	2.593E-01	7.68E-02	G K
		105.31	6.686E-02	%	2.962E-01	8.87E-02	G
HG-203	0.0000E+00						
		279.17	0.000E+00	&(P	0.000E+00	0.00E+00	G K
		72.87	0.000E+00	& P	0.000E+00	0.00E+00	G
		70.83	0.000E+00	%	0.000E+00	0.00E+00	G
		82.50	0.000E+00	&	0.000E+00	0.00E+00	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	2.2641E-01						
		583.14	2.264E-01	@(P	3.716E-02	1.92E-02	G
		510.72	3.476E-01	+ P	1.729E-01	6.73E-02	G
PB-212	6.1698E-01						
		238.63	6.170E-01	(P	8.309E-02	3.53E-02	G K
							Energy duplication
		77.11	6.170E-01	} P	3.505E-01	1.04E-01	G
		74.81	9.570E-01	+ P	7.348E-01	2.35E-01	G
PB-214	4.0825E-01						
		351.99	4.186E-01	(P	8.925E-02	3.97E-02	G K
		295.22	3.883E-01	(P	1.223E-01	4.64E-02	G
							Energy duplication
		77.11	0.000E+00	} P	8.475E-01	0.00E+00	G
		241.92	2.697E-01	%	5.319E-01	1.62E-01	G
BI-212	4.8692E-01						
		727.17	4.869E-01	*(P	3.015E-01	1.22E-01	G K
		1620.56	1.085E+00	+ P	6.203E-01	3.19E-01	G
		785.42	6.115E-03	%	1.822E+00	5.15E-01	G
BI-214	4.1245E-01						
		609.32	3.970E-01	(P	6.717E-02	3.23E-02	G K
		1764.51	4.571E-01	(P	1.457E-01	7.81E-02	G
		1120.28	6.290E-01	+ P	2.591E-01	1.15E-01	G
RA-224	7.7792E-01						
		241.00	7.779E-01	(	1.001E+00	3.08E-01	G
RA-226	1.4202E+00						
		185.99	1.420E+00	(P	9.224E-01	3.13E-01	G
AC-228	6.2743E-01						
		911.07	6.274E-01	(P	1.204E-01	6.02E-02	G K
		968.90	8.063E-01	+ P	2.606E-01	1.19E-01	G
		338.40	4.997E-01	- P	2.102E-01	7.61E-02	G
TH-227	-3.7419E-03						
		236.00	-3.742E-03	%(	3.469E-01	1.03E-01	G K
		256.25	5.371E-02	& P	4.794E-01	1.42E-01	G
PA-234	2.2606E-02						
		98.44	2.261E-02	%(P	2.084E-01	6.20E-02	G K
		946.00	3.174E-02	% P	8.563E-02	2.52E-02	G
		131.28	-5.599E-03	% P	1.996E-01	5.92E-02	G
		94.67	-1.874E-01	% P	4.282E-01	1.30E-01	G
		883.24	8.876E-02	%	2.266E-01	6.76E-02	G
		926.70	5.475E-02	%	2.827E-01	8.13E-02	G

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 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26-5.794E-02 % P 3.313E-01 9.57E-02 G

TH-234       1.0997E+00
                           63.29 1.100E+00 %(P 6.581E+00 1.96E+00 G K
                           92.80 1.234E+00 % P 2.156E+00 6.52E-01 G
                           92.38 1.515E+00 % P 2.528E+00 7.66E-01 G

AM-241      -2.3549E-01
                           59.54-2.355E-01 %(P 1.109E+00 3.31E-01 G
   ( - This peak used in the nuclide activity average.

   * - Peak is too wide, but only one peak in library.
   ! - Peak is part of a multiplet and this area went
       negative during deconvolution.
   ? - Peak is too narrow.
   @ - Peak is too wide at FW25M, but ok at FWHM.
   % - Peak fails sensitivity test.
   $ - Peak identified, but first peak of this nuclide
       failed one or more qualification tests.
   + - Peak activity higher than counting uncertainty range.
   - - Peak activity lower than counting uncertainty range.
   = - Peak outside analysis energy range.
   & - Calculated peak centroid is not close enough to the
       library energy centroid for positive identification.
   P - Peakbackground subtraction
   } - Peak is too close to another for the activity
       to be found directly.

   Nuclide Codes:                      Peak Codes:
   T - Thermal Neutron Activation      G - Gamma Ray
   F - Fast Neutron Activation         X - X-Ray
   I - Fission Product                 P - Positron Decay
   N - Naturally Occurring Isotope     S - Single-Escape
   P - Photon Reaction                 D - Double-Escape
   C - Charged Particle Reaction       K - Key Line
   M - No MDA Calculation              A - Not in Average
   R - Coincidence Corrected           C - Coincidence Peak
   H - Halflife limit exceeded

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
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***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	6.3753E-03	>12 Halflives	2.3148E-01	2.3148E-01	2.698E-01
K-40		1.2873E+01	1.2873E+01	1.2912E+00	1.4919E+00	
MN-54	#A	1.3288E-02	6.8119E-02	1.5063E-01	1.5068E-01	3.272E-02
CO-57	#B	1.2623E-02	8.3537E-02	2.7697E-01	2.7700E-01	4.650E-02
CO-60	#B	-1.2349E-03	-1.6096E-03	7.6500E-02	7.6500E-02	3.633E-02

Sr-85	#A	-1.2996E-02	-3.3993E+01	9.7826E+01	9.7846E+01	4.172E-02
Kr-85	#A	-3.0001E+02	-3.0164E+02	8.6808E+02	8.6826E+02	9.631E+02
Y-88	#B	6.0154E-04	7.2117E-02	1.8656E+00	1.8656E+00	2.154E-02
NB-94	#B	2.8575E-03	2.8577E-03	2.8113E-02	2.8114E-02	3.307E-02
Ag-108M	#B	2.9138E-04	2.9460E-04	3.9254E-02	3.9254E-02	4.519E-02
CD-109	#A	-6.9607E-03	-2.1456E-02	5.2242E+00	5.2242E+00	1.903E+00
SN-113	#B	5.4588E-03	4.5957E-01	3.2267E+00	3.2268E+00	4.375E-02
SB-125	#B	4.2987E-02	7.1182E-02	1.4179E-01	1.4185E-01	9.437E-02
I-131	#B	2.1066E-03	>12 Halflives	3.0280E-02	3.0280E-02	3.476E-02
CS-134	#B	1.5213E-02	2.9954E-02	3.3694E-02	3.3738E-02	6.566E-02
CS-137	#	5.5971E-02	5.8630E-02	5.1763E-02	5.1874E-02	
CE-139	#A	4.3398E-03	1.7745E-01	1.6604E+00	1.6604E+00	4.550E-02
EU-152	#B	1.0311E-01	1.1509E-01	1.0539E-01	1.0559E-01	1.364E-01
EU-154	#B	-1.1576E-02	-1.3644E-02	1.0877E-01	1.0878E-01	1.033E-01
EU-155	#B	4.9643E-03	6.5793E-03	2.3029E-01	2.3029E-01	1.957E-01
HG-203	#B	2.1659E-02	>12 Halflives	3.1823E-02	3.1848E-02	3.458E-02
TL-208	#	2.2641E-01	2.2641E-01	5.7670E-02	5.9149E-02	
PB-212		6.1698E-01	6.1698E-01	1.0568E-01	1.1159E-01	
PB-214		4.0825E-01	4.0825E-01	9.3354E-02	9.6316E-02	
BI-212		4.8692E-01	4.8692E-01	3.6542E-01	3.6651E-01	
BI-214		4.1245E-01	4.1245E-01	1.0072E-01	1.0353E-01	
RA-224	A	7.7792E-01	7.7792E-01	9.2448E-01	9.2558E-01	1.001E+00
RA-226		1.4190E+00	1.4202E+00	9.3703E-01	9.4065E-01	
AC-228		6.2743E-01	6.2743E-01	1.8061E-01	1.8425E-01	
TH-227	#B	-3.7419E-03	-3.7419E-03	3.0784E-01	3.0784E-01	3.469E-01
PA-234	#B	2.2606E-02	2.2606E-02	1.8605E-01	1.8606E-01	2.084E-01
TH-234	#B	1.0997E+00	1.0997E+00	5.8815E+00	5.8818E+00	6.581E+00
AM-241	#A	-2.3473E-01	-2.3549E-01	1.0122E+00	1.0122E+00	1.105E+00

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (86.9 to 2000.7 keV) 1.7904566E+01 pCi/gm
Total Decayed Activity (86.9 to 2000.7 keV) 1.7908464E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JPK

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

Sample description
FSS-OOL-05-03-018-F

Spectrum Filename: C:\GammaVision\Spectra\103F_8SEP2006_0851.An1

Acquisition information

Start time:	08-Sep-2006 08:51:53
Live time:	2000
Real time:	2001
Dead time:	0.07 %
Detector ID:	4

Detector system
Det 103 - DSPE-471

Calibration

Filename:	D3_1LSa.Clb

Detector_103 1.0 Liter Sand Geometry

Energy Calibration

Created:	08-Aug-2005 11:09:41
Zero offset:	0.409 keV
Gain:	0.500 keV/channel
Quadratic:	1.092E-08 keV/channel^2

Efficiency Calibration

Created:	08-Aug-2005 11:11:25
Type:	Polynomial
Uncertainty:	0.993 %
Coefficients:	-0.264059 -5.138468 0.638383
	-0.089199 0.005011 -0.000129

Library Files

Main analysis library:	FSS_Rev_1.Lib
Library Match Width:	1.000
Peak stripping:	Library based

Analysis parameters

Analysis engine:	Env32 G53W4.20
Start channel:	100 (50.41keV)
Stop channel:	4000 (2000.67keV)
Peak rejection level:	41.667%
Peak search sensitivity:	3
Sample Size:	1.0740E+03
Activity scaling factor:	1.0000E+06/(1.0000E+00* 1.0740E+03) = 9.3110E+02
Detection limit method:	Nureg 4.16
Random error:	1.0000000E+00
Systematic error:	1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	01-Sep-2006 08:45:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	103_150K_05AUG05.Pbc 08-Aug-2005 12:54:15
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 16 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.0692

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
74.95	87.	24.88	0.99	9.052E-03	74.81	9.600	1.256E+00	PB212
77.25	110.	17.14	0.99	1.011E-02	77.11	17.500	9.599E-01	PB212
					77.11	10.700	1.570E+00	PB214
93.11	66.	38.86	1.50	1.645E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
185.97	179.	18.11	1.09	2.567E-02				
185.97	179.	18.11	1.09	2.567E-02	185.99	3.280	2.482E+00	RA226
209.62	76.	29.94	0.76	2.470E-02				
238.70	664.	4.62	1.09	2.320E-02	238.63	43.100	8.211E-01	PB212
241.63	80.	28.10	1.09	2.305E-02	241.00	3.900	1.117E+00	RA224
					241.92	7.470	5.846E-01	PB214
270.15	62.	40.55	1.05	2.152E-02				
295.27	191.	13.53	1.10	2.025E-02	295.22	19.200	6.038E-01	PB214
338.49	120.	17.22	1.00	1.830E-02	338.40	12.010	6.778E-01	AC228
351.80	317.	8.85	0.98	1.776E-02	351.99	37.100	5.944E-01	PB214
462.46	70.	23.86	1.22	1.427E-02				
462.46	70.	23.86	1.22	1.427E-02	463.51	10.000	6.134E-01	SB125
510.38	113.	17.99	1.07	1.318E-02	510.72	22.500	3.682E-01	TL208
583.11	209.	9.23	1.20	1.185E-02	583.14	86.000	2.523E-01	TL208
609.29	264.	8.43	1.21	1.144E-02	609.32	46.090	6.151E-01	BI214
662.04	88.	19.30	1.99	1.072E-02	661.62	84.620	1.196E-01	CS137
727.32	71.	19.77	1.34	9.963E-03	727.17	11.800	7.545E-01	BI212
795.10	30.	30.70	1.50	9.301E-03	795.76	85.400	4.759E-02	CS134
910.99	178.	9.65	1.28	8.402E-03	911.07	29.000	8.998E-01	AC228
968.98	131.	15.27	1.40	8.025E-03	968.90	17.460	1.179E+00	AC228
1120.37	70.	20.21	1.76	7.211E-03	1120.28	15.040	7.901E-01	BI214
1238.02	54.	28.08	1.25	6.702E-03				

1460.74	824.	3.52	1.87	5.932E-03	1460.75	10.700	1.597E+01	K40
1764.36	49.	14.29	1.26	5.142E-03	1764.51	15.920	7.029E-01	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide
418.41	209.62	194.	76.	0.038	89.82	0.758	NP-239 s
482.41	241.46	212.	80.	0.040	84.31	1.095	RA-224 lD
539.45	270.15	221.	62.	0.031	121.66	1.052	AC-228 s
2474.97	1238.02	55.	54.	0.027	84.25	1.252	BI-214

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-212	148.79	74.81	208.	87.	0.043	74.65	0.993D
PB-212	153.39	77.11	202.	110.	0.055	51.42	0.995A
RA-226	371.57	186.21	342.	143.	0.072	54.80	1.500s
PB-212	476.71	238.78	419.	688.	0.344	19.00	1.101
PB-214	589.69	295.27	186.	187.	0.093	40.58	1.095
AC-228	676.12	338.49	123.	118.	0.059	51.65	0.997
PB-214	702.74	351.80	157.	311.	0.156	26.54	0.984
SB-125	925.40	463.14	69.	47.	0.024	83.61	1.500s
TL-208	1019.88	510.38	121.	87.	0.043	53.97	1.073s
TL-208	1165.33	583.11	67.	204.	0.102	27.69	1.201s
BI-214	1217.68	609.29	86.	258.	0.129	25.28	1.210
CS-137	1323.16	662.04	70.	86.	0.043	57.91	1.988s
BI-212	1453.71	727.32	52.	40.	0.020	88.76	1.500s
CS-134	1589.25	795.10	27.	30.	0.015	92.09	1.500s
AC-228	1821.01	910.99	45.	174.	0.087	28.94	1.277s
AC-228	1936.97	968.98	70.	131.	0.066	45.82	1.398
BI-214	2239.71	1120.37	44.	68.	0.034	60.64	1.759
K-40	2920.34	1460.74	22.	806.	0.403	10.56	1.869
BI-214	3527.48	1764.36	3.	46.	0.023	42.86	1.262s

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	MDA Value pCi/gm	COMMENTS
BE-7		-3.5412E-02					
			477.56	-3.541E-02	&(	4.605E-01 1.33E-01	G
K-40		1.5969E+01					
			1460.75	1.597E+01	(P	4.911E-01 5.75E-01	G
MN-54		5.5564E-03					
			834.81	5.556E-03	%(P	4.795E-02 1.36E-02	G
CO-57		-6.0581E-05					
			122.07	-6.058E-05	&(P	5.773E-02 1.70E-02	G K
			136.43	1.376E-01	%	4.620E-01 1.39E-01	G
CO-60		1.6238E-03					
			1332.51	1.624E-03	%(P	3.954E-02 1.00E-02	G K
			1173.23	-4.439E-03	& P	6.235E-02 1.71E-02	G K
Sr-85		-1.6763E-02					
			514.00	-1.676E-02	%(	5.765E-02 1.72E-02	G
Kr-85		-3.5944E+02					
			513.99	-3.594E+02	%(	1.235E+03 3.68E+02	G
Y-88		1.0597E-03					
			1836.01	1.060E-03	&(P	4.715E-02 1.22E-02	G K
			898.02	5.167E-03	& P	4.477E-02 1.25E-02	G
NB-94		-1.2008E-02					
			871.10	-1.201E-02	%(	5.395E-02 1.57E-02	G K
			702.50	-1.099E-02	%	5.182E-02 1.52E-02	G K
Ag-108M		-1.7113E-02					
			722.95	-1.711E-02	%(	6.184E-02 1.83E-02	G K
			614.37	-7.774E-03	% P	5.502E-02 1.60E-02	G
			433.93	-5.577E-03	&	4.527E-02 1.32E-02	G
CD-109		1.6602E+00					
			88.04	1.660E+00	%(	2.462E+00 7.54E-01	G
SN-113		1.7718E-03					
			391.71	1.772E-03	%(	5.549E-02 1.59E-02	G K
			255.04	2.297E-01	%	2.080E+00 6.13E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	1.1821E-01						
		427.95	1.629E-02	&(P	1.359E-01	3.95E-02	G K
		600.77	2.293E-02	% P	2.356E-01	6.76E-02	G
		636.15	-7.199E-03	& P	3.427E-01	9.50E-02	G
		463.51	4.199E-01	*(P	3.667E-01	1.20E-01	G
		176.29	-9.282E-02	%	7.604E-01	2.26E-01	G
I-131	5.5742E-03						
		364.48	5.574E-03	%(P	9.552E-02	2.78E-02	G K
		636.97	5.474E-02	&	1.012E+00	2.86E-01	G
		284.29	-1.451E-03	& P	1.032E+00	2.98E-01	G
CS-134	1.1966E-02						
		604.66	-1.920E-02	&(	5.649E-02	1.69E-02	G K
		795.76	4.759E-02	(P	4.316E-02	1.46E-02	G
		569.29	5.339E-03	& P	2.419E-01	6.75E-02	G
		801.84	1.161E-01	% P	4.703E-01	1.35E-01	G
CS-137	1.1961E-01						
		661.62	1.196E-01	*(P	5.777E-02	2.35E-02	G
CE-139	-1.9843E-03						
		165.85	-1.984E-03	%(	6.166E-02	1.82E-02	G
EU-152	6.3067E-02						
		121.78	6.307E-02	&(P	1.592E-01	4.80E-02	G K
		344.30	-5.701E-03	& P	1.472E-01	4.27E-02	G
		1408.08	9.330E-02	%	1.694E-01	5.28E-02	G
		964.00	5.091E-02	% P	3.232E-01	9.19E-02	G
		1112.07	0.000E+00	%	4.117E-01	1.14E-01	G
		778.90	-7.192E-02	%	3.785E-01	1.10E-01	G
EU-154	1.4039E-03						
		123.10	1.404E-03	%(	1.409E-01	4.17E-02	G K
		1274.80	4.750E-03	&	1.702E-01	4.75E-02	G
		723.30	-8.970E-02	%	3.088E-01	9.17E-02	G
		1004.80	-6.025E-02	%	3.237E-01	9.37E-02	G
EU-155	-1.1632E-02						
		86.45	-1.163E-02	&(	3.313E-01	9.84E-02	G K
		105.31	8.852E-02	&	2.903E-01	8.72E-02	G
HG-203	1.5464E-02						
		279.17	1.546E-02	&(P	5.101E-02	1.52E-02	G K
		72.87	-3.980E-01	& P	2.715E+00	8.08E-01	G
		70.83	-1.067E+00	&	6.299E+00	1.88E+00	G
		82.50	5.325E-01	&	5.410E+00	1.61E+00	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments

TL-208       2.5234E-01
                          583.14 2.523E-01 @(P 5.036E-02 2.38E-02 G
                          510.72 3.682E-01 + P 2.294E-01 8.66E-02 G

PB-212       8.9265E-01
                          238.63 8.653E-01  (P 1.235E-01 5.57E-02 G K
                                                          Energy duplication
                           77.11 7.805E-01 } P 4.900E-01 1.34E-01 G
                           74.81 1.256E+00 + P 1.012E+00 3.24E-01 G

PB-214       5.9761E-01
                          351.99 5.944E-01  (P 1.167E-01 5.35E-02 G K
                          295.22 6.038E-01  (P 2.147E-01 8.35E-02 G
                                                          Energy duplication
                           77.11 0.000E+00 } P 1.098E+00 0.00E+00 G
                          241.92-3.120E-02 %   7.563E-01 2.24E-01 G

BI-212       4.2646E-01
                          727.17 4.265E-01 *(P 3.871E-01 1.28E-01 G K
                         1620.56-1.220E-02 & P 1.539E+00 3.99E-01 G
                          785.42 6.367E-02 &   2.210E+00 6.19E-01 G

BI-214       6.6737E-01
                          609.32 6.151E-01  (P 1.098E-01 5.31E-02 G K
                         1764.51 7.029E-01  (P 1.712E-01 1.08E-01 G
                         1120.28 7.901E-01  (P 3.896E-01 1.64E-01 G

RA-224       9.8188E-01
                          241.00 9.819E-01 %(  1.345E+00 4.14E-01 G

RA-226       2.1406E+00
                          185.99 2.141E+00 @(P 1.328E+00 4.26E-01 G

AC-228       8.9982E-01
                          911.07 8.998E-01 @(P 1.750E-01 8.85E-02 G K
                          968.90 1.179E+00 + P 3.738E-01 1.80E-01 G
                          338.40 6.778E-01 - P 3.109E-01 1.18E-01 G

TH-227       0.0000E+00
                          236.00 0.000E+00 %(  5.350E-01 1.58E-01 G K
                          256.25 1.011E-01 & P 5.562E-01 1.65E-01 G

PA-234      -8.7303E-03
                           98.44-8.730E-03 %(P 2.545E-01 7.50E-02 G K
                          946.00 5.559E-02 & P 1.882E-01 5.48E-02 G
                          131.28-1.503E-03 % P 2.640E-01 7.80E-02 G
                           94.67-1.481E-01 % P 5.172E-01 1.55E-01 G
                          883.24 9.817E-02 %   3.034E-01 8.90E-02 G
                          926.70-6.963E-02 %   4.038E-01 1.15E-01 G
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 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26 9.205E-03 & P 3.692E-01 1.03E-01 G

TH-234       9.5503E-01
                           63.29 9.550E-01 %(P 8.286E+00 2.45E+00 G K
                           92.80 1.678E+00 % P 2.731E+00 8.27E-01 G
                           92.38 1.272E+00 & P 3.361E+00 1.01E+00 G

AM-241      -1.3937E-02
                           59.54-1.394E-02 %(P 1.312E+00 3.85E-01 G
   ( - This peak used in the nuclide activity average.

   * - Peak is too wide, but only one peak in library.
   ! - Peak is part of a multiplet and this area went
       negative during deconvolution.
   ? - Peak is too narrow.
   @ - Peak is too wide at FW25M, but ok at FWHM.
   % - Peak fails sensitivity test.
   $ - Peak identified, but first peak of this nuclide
       failed one or more qualification tests.
   + - Peak activity higher than counting uncertainty range.
   - - Peak activity lower than counting uncertainty range.
   = - Peak outside analysis energy range.
   & - Calculated peak centroid is not close enough to the
       library energy centroid for positive identification.
   P - Peakbackground subtraction
   } - Peak is too close to another for the activity
       to be found directly.

   Nuclide Codes:                      Peak Codes:
   T - Thermal Neutron Activation      G - Gamma Ray
   F - Fast Neutron Activation         X - X-Ray
   I - Fission Product                 P - Positron Decay
   N - Naturally Occurring Isotope     S - Single-Escape
   P - Photon Reaction                 D - Double-Escape
   C - Charged Particle Reaction       K - Key Line
   M - No MDA Calculation              A - Not in Average
   R - Coincidence Corrected           C - Coincidence Peak
   H - Halflife limit exceeded

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
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***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	-3.2335E-02	-3.5412E-02	3.9935E-01	3.9935E-01	4.204E-01
K-40		1.5969E+01	1.5969E+01	1.7253E+00	1.9587E+00	
MN-54	#A	5.4706E-03	5.5564E-03	4.0940E-02	4.0941E-02	4.721E-02
CO-57	#B	-5.9501E-05	-6.0581E-05	7.9759E-02	7.9759E-02	5.670E-02
CO-60	#B	1.6197E-03	1.6238E-03	3.0037E-02	3.0037E-02	3.944E-02

Sr-85	#A	-1.5553E-02	-1.6763E-02	5.1465E-02	5.1474E-02	5.349E-02
Kr-85	#A	-3.5942E+02	-3.5944E+02	1.1026E+03	1.1028E+03	1.235E+03
Y-88	#B	1.0125E-03	1.0597E-03	3.6661E-02	3.6661E-02	4.505E-02
NB-94	#B	-1.2008E-02	-1.2008E-02	4.7235E-02	4.7241E-02	5.395E-02
Ag-108M	#B	-1.7111E-02	-1.7113E-02	5.4863E-02	5.4872E-02	6.184E-02
CD-109	#A	1.6425E+00	1.6602E+00	2.2615E+00	2.2634E+00	2.435E+00
SN-113	#B	1.6986E-03	1.7718E-03	4.7635E-02	4.7635E-02	5.320E-02
SB-125	#B	1.1764E-01	1.1821E-01	1.0150E-01	1.0173E-01	1.353E-01
I-131	#B	3.0473E-03	5.5742E-03	8.3311E-02	8.3312E-02	5.222E-02
CS-134	#B	1.1889E-02	1.1966E-02	1.1051E-02	1.1073E-02	5.613E-02
CS-137	#	1.1956E-01	1.1961E-01	7.0384E-02	7.0725E-02	
CE-139	#A	-1.9155E-03	-1.9843E-03	5.4698E-02	5.4699E-02	5.952E-02
EU-152	#B	6.3001E-02	6.3067E-02	1.4400E-01	1.4405E-01	1.591E-01
EU-154	#B	1.4017E-03	1.4039E-03	1.2510E-01	1.2510E-01	1.407E-01
EU-155	#B	-1.1601E-02	-1.1632E-02	2.9535E-01	2.9535E-01	3.304E-01
HG-203	#B	1.3933E-02	1.5464E-02	4.5684E-02	4.5693E-02	4.596E-02
TL-208	#	2.5234E-01	2.5234E-01	7.1360E-02	7.2848E-02	
PB-212		8.9265E-01	8.9265E-01	1.7253E-01	1.8014E-01	
PB-214		5.9761E-01	5.9761E-01	1.4789E-01	1.5191E-01	
BI-212	#	4.2646E-01	4.2646E-01	3.8320E-01	3.8400E-01	3.871E-01
BI-214		6.6737E-01	6.6737E-01	1.7294E-01	1.7723E-01	
RA-224	#A	9.8188E-01	9.8188E-01	1.2410E+00	1.2423E+00	1.345E+00
RA-226	#	2.1406E+00	2.1406E+00	1.2791E+00	1.2851E+00	1.328E+00
AC-228		8.9982E-01	8.9982E-01	2.6544E-01	2.7053E-01	
TH-227	#B	0.0000E+00	0.0000E+00	4.7523E-01	4.7523E-01	5.350E-01
PA-234	#B	-8.7303E-03	-8.7303E-03	4.2827E-01	4.2827E-01	2.545E-01
TH-234	#B	9.5503E-01	9.5503E-01	7.3578E+00	7.3580E+00	8.286E+00
AM-241	#A	-1.3936E-02	-1.3937E-02	1.8080E+00	1.8080E+00	1.312E+00

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (87.4 to 2000.7 keV) 1.9398697E+01 pCi/gm
Total Decayed Activity (87.4 to 2000.7 keV) 1.9398750E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JJM

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 107_1SEP2006_0631.An1

Sample description
OOL-05-03-004-MTP

Spectrum Filename: C:\GammaVision\Spectra\107_1SEP2006_0631.An1

Acquisition information
Start time: 01-Sep-2006 06:31:38
Live time: 2000
Real time: 2011
Dead time: 0.54 %
Detector ID: 2

Detector system
Det 107- DSPE- 634

Calibration
Filename: D7_1LSa.Clb
Detector 107 Calibration for 1 Liter Sand Marinelli

Energy Calibration
Created: 29-Oct-2004 06:48:53
Zero offset: 0.157 keV
Gain: 0.500 keV/channel
Quadratic: -1.676E-08 keV/channel^2

Efficiency Calibration
Created: 29-Oct-2004 06:51:32
Type: Polynomial
Uncertainty: 1.174 %
Coefficients: -0.279532 -4.778179 0.614896
-0.087174 0.005356 -0.000131

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.16keV)
Stop channel: 4000 (2000.15keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 1.5400E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.5400E+03) =
6.4935E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	29-Aug-2006 11:10:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	107_150K_28APR05.Pbc 01-May-2005 05:30:33
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 20 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.0761

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
74.72	336.	12.53	1.18	2.842E-02	72.87	6.400	1.741E+00	HG203
					74.81	9.600	1.066E+00	PB212
77.05	551.	7.98	1.18	2.953E-02	77.11	17.500	9.346E-01	PB212
					77.11	10.700	1.515E+00	PB214
87.00	130.	37.12	1.02	3.299E-02	86.45	32.740	1.065E-01	EU155
92.52	209.	26.40	1.78	3.432E-02	92.38	2.570	2.004E+00	TH234
					92.80	3.000	1.612E+00	TH234
178.42	82.	41.51	1.08	3.664E-02				
186.00	171.	20.65	1.31	3.610E-02	185.99	3.280	1.264E+00	RA226
209.21	117.	24.38	1.77	3.429E-02				
238.72	1247.	3.52	1.30	3.188E-02	238.63	43.100	7.857E-01	PB212
241.55	167.	18.27	1.30	3.165E-02	241.00	3.900	1.172E+00	RA224
					241.92	7.470	6.161E-01	PB214
270.61	117.	28.34	1.34	2.942E-02				
277.28	81.	32.33	1.42	2.893E-02				
277.28	81.	32.33	1.42	2.893E-02	279.17	81.500	PBC<MDA	HG203
295.25	271.	9.57	1.34	2.768E-02	295.22	19.200	4.400E-01	PB214
300.28	83.	25.12	1.34	2.735E-02				
338.43	259.	10.44	1.49	2.500E-02	338.40	12.010	7.474E-01	AC228
351.97	496.	5.89	1.63	2.426E-02	351.99	37.100	4.786E-01	PB214
409.56	59.	35.68	1.51	2.154E-02				
463.04	85.	30.47	0.90	1.954E-02				
463.04	85.	30.47	0.90	1.954E-02	463.51	10.000	3.696E-01	SB125
510.84	183.	14.12	2.41	1.808E-02	510.72	22.500	3.213E-01	TL208
583.18	427.	6.54	1.80	1.629E-02	583.14	86.000	2.644E-01	TL208
609.31	443.	6.93	1.88	1.574E-02	609.32	46.090	5.310E-01	BI214
727.24	150.	15.34	1.33	1.374E-02	727.17	11.800	8.020E-01	BI212

794.72	40.	30.83	1.68	1.284E-02	795.76	85.400	3.170E-02	CS134
911.25	322.	7.57	1.95	1.161E-02	911.07	29.000	8.289E-01	AC228
964.03	60.	20.44	1.80	1.113E-02	964.00	14.580	PBC<MDA	EU152
969.01	160.	10.15	1.80	1.109E-02	968.90	17.460	7.130E-01	AC228
1119.83	102.	23.09	2.21	9.970E-03	1120.28	15.040	5.982E-01	BI214
1460.60	1556.	2.55	2.29	8.192E-03	1460.75	10.700	1.553E+01	K40

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
1764.29	78.	11.95	1.15	7.084E-03	1764.51	15.920	6.031E-01	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
356.48	178.42	449.	101.	0.050	94.01	1.081	TA-182	s
418.06	209.21	331.	117.	0.058	73.14	1.766	AC-228	s
540.85	270.61	351.	117.	0.058	85.03	1.340	AC-228	s
554.18	277.28	253.	80.	0.040	90.26	1.425	TL-208	
599.89	300.13	204.	80.	0.040	84.96	1.053	PB-212	sM
818.73	409.56	149.	59.	0.030	107.03	1.514	AC-228	s
1927.77	964.00	44.	61.	0.031	59.67	1.796	EU-152	D

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.
M - Peak is close to a library peak.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-212	149.29	74.81	724.	332.	0.166	37.70	1.178D
PB-212	153.89	77.11	693.	389.	0.195	27.26	1.179A
PB-214	153.89	77.11	1175.	146.	0.073	99.59	1.500A
EU-155	173.97	87.15	1319.	152.	0.076	104.23	1.500
TH-234	185.69	93.01	1270.	190.	0.095	79.01	1.500s
TH-234	185.66	93.00	1241.	178.	0.089	77.96	1.500s
RA-226	371.64	186.00	465.	171.	0.085	61.95	1.307s
PB-212	476.89	238.63	305.	1228.	0.614	10.30	1.297D
PB-214	483.47	241.92	429.	155.	0.077	61.08	1.299D
PB-214	589.84	295.11	280.	281.	0.140	32.37	1.323s
AC-228	676.47	338.43	192.	256.	0.128	31.33	1.491s
PB-214	703.55	351.97	161.	491.	0.245	17.68	1.628
SB-125	925.46	462.93	130.	66.	0.033	78.20	1.500s
TL-208	1021.27	510.84	189.	149.	0.074	42.35	2.409s
TL-208	1165.94	583.18	118.	422.	0.211	19.62	1.800
BI-214	1218.20	609.31	136.	439.	0.220	20.78	1.877s
BI-212	1454.06	727.24	109.	148.	0.074	46.01	1.330s
CS-134	1589.01	794.72	57.	40.	0.020	92.48	1.684s
AC-228	1822.06	911.25	87.	318.	0.159	22.72	1.950
AC-228	1937.36	968.90	62.	157.	0.079	31.35	1.799D

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
BI-214	2239.23	1119.83	120.	102.	0.051	69.28	2.207
K-40	2920.80	1460.60	11.	1551.	0.776	7.66	2.293
BI-214	3528.23	1764.29	3.	78.	0.039	35.85	1.145s

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	Peak MDA Value pCi/gm	COMMENTS
BE-7		-4.0900E-02					
			477.56	-4.090E-02	&(	2.678E-01 7.87E-02	G
K-40		1.5534E+01					
			1460.75	1.553E+01	(P	1.785E-01 3.98E-01	G
MN-54		-1.1712E-03					
			834.81	-1.171E-03	&(P	4.523E-02 1.31E-02	G
CO-57		-6.5713E-03					
			122.07	-6.571E-03	%(P	3.272E-02 9.80E-03	G K
			136.43	-6.826E-03	& P	3.157E-01 9.41E-02	G
CO-60		-9.6255E-03					
			1332.51	-9.625E-03	%(P	3.848E-02 1.08E-02	G K
			1173.23	-5.048E-03	% P	5.575E-02 1.60E-02	G K
Sr-85		-2.0055E-02					
			514.00	-2.005E-02	%(	4.066E-02 1.23E-02	G
Kr-85		-4.9120E+02					
			513.99	-4.912E+02	%(P	9.209E+02 2.78E+02	G
Y-88		-1.0658E-03					
			1836.01	-1.066E-03	%(P	3.027E-02 7.94E-03	G K
			898.02	2.777E-03	% P	2.906E-02 8.23E-03	G
NB-94		4.1461E-03					
			871.10	4.146E-03	%(P	2.206E-02 6.33E-03	G K
			702.50	-2.100E-03	% P	2.889E-02 8.30E-03	G K
Ag-108M		0.0000E+00					
			722.95	0.000E+00	&(	7.182E-02 2.12E-02	G K
			614.37	4.636E-04	%	2.740E-02 7.82E-03	G
			433.93	-1.304E-03	% P	3.185E-02 9.25E-03	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CD-109	2.7526E-02						
		88.04	2.753E-02	%(P	1.282E+00	3.83E-01	G
SN-113	-2.8981E-03						
		391.71	-2.898E-03	%(P	4.234E-02	1.23E-02	G K
		255.04	-3.021E-01	%	1.321E+00	3.95E-01	G
SB-125	7.5899E-02						
		427.95	1.030E-03	&(P	8.895E-02	2.58E-02	G K
		600.77	-4.727E-02	& P	1.718E-01	5.07E-02	G
		636.15	-5.243E-03	& P	2.729E-01	7.84E-02	G
		463.51	2.975E-01	(P	2.511E-01	8.09E-02	G
		176.29	-1.969E-01	% P	4.958E-01	1.50E-01	G
I-131	-9.9872E-03						
		364.48	-9.987E-03	%(	3.740E-02	1.11E-02	G K
		636.97	9.383E-03	&	5.165E-01	1.49E-01	G
		284.29	4.016E-02	%	5.060E-01	1.49E-01	G
CS-134	1.6646E-02						
		604.66	3.469E-03	%(P	7.717E-02	2.30E-02	G K
		795.76	3.170E-02	(P	3.033E-02	9.90E-03	G
		569.29	1.964E-02	&	1.621E-01	4.71E-02	G
		801.84	6.206E-02	% P	3.190E-01	9.29E-02	G
CS-137	8.5094E-03						
		661.62	8.509E-03	%(P	3.914E-02	1.15E-02	G
CE-139	-5.2722E-04						
		165.85	-5.272E-04	%(P	3.934E-02	1.17E-02	G
EU-152	7.3376E-04						
		121.78	7.338E-04	%(P	1.129E-01	3.36E-02	G K
		344.30	1.060E-02	% P	1.000E-01	2.95E-02	G
		1408.08	-3.485E-03	% P	1.752E-01	4.88E-02	G
							Energy duplication
		964.00	1.794E-01	& P	3.487E-01	1.06E-01	G
		1112.07	9.437E-02	& P	2.601E-01	7.75E-02	G
		778.90	5.375E-02	& P	1.867E-01	5.49E-02	G
EU-154	1.3758E-02						
		123.10	1.376E-02	%(P	8.016E-02	2.40E-02	G K
		1274.80	1.572E-02	% P	1.036E-01	2.99E-02	G
		723.30	-1.429E-03	& P	3.243E-01	9.57E-02	G
		1004.80	1.703E-02	& P	1.806E-01	5.17E-02	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments

EU-155       1.2424E-01
                          86.45 1.242E-01  (  1.405E-01 4.32E-02 G K
                         105.31 2.931E-02 % P 1.606E-01 4.82E-02 G

HG-203      -2.8328E-04
                         279.17-2.833E-04 &(P 3.203E-02 9.38E-03 G K
                          72.87 3.061E-02 % P 1.059E+00 3.17E-01 G
                          70.83-9.397E-01 &   1.866E+00 5.66E-01 G
                          82.50-9.414E-01 %   2.252E+00 6.82E-01 G

TL-208       2.6436E-01
                         583.14 2.644E-01  (P 3.340E-02 1.75E-02 G
                         510.72 3.213E-01 + P 1.440E-01 5.56E-02 G

PB-212       7.8372E-01
                         238.63 7.837E-01  (P 5.370E-02 2.73E-02 G K
                                                         Energy duplication
                          77.11 6.604E-01 }   2.126E-01 6.00E-02 G
                          74.81 1.063E+00 + P 4.111E-01 1.35E-01 G

PB-214       4.7346E-01
                         351.99 4.786E-01  (P 6.031E-02 2.85E-02 G K
                         295.22 4.635E-01 *(P 1.333E-01 5.08E-02 G
                                                         Energy duplication
                          77.11 4.043E-01 } P 4.505E-01 1.34E-01 G
                         241.92 5.748E-01 + P 3.686E-01 1.18E-01 G

BI-212       8.0200E-01
                         727.17 8.020E-01 *(P 2.777E-01 1.24E-01 G K
                        1620.56-2.117E-02 & P 1.106E+00 2.98E-01 G
                         785.42 5.340E-01 % P 1.380E+00 4.12E-01 G

BI-214       5.5902E-01
                         609.32 5.310E-01  (P 6.899E-02 3.72E-02 G K
                        1764.51 6.031E-01 *(P 8.889E-02 7.29E-02 G
                        1120.28 5.982E-01  (P 3.143E-01 1.39E-01 G

RA-224       4.5032E-02
                         241.00 4.503E-02 %(P 1.044E+00 3.11E-01 G

RA-226       1.2642E+00
                         185.99 1.264E+00 @(  7.651E-01 2.61E-01 G

AC-228       7.7759E-01
                         911.07 8.289E-01  (P 1.204E-01 6.36E-02 G K
                         968.90 7.132E-01  (P 1.780E-01 7.56E-02 G
                         338.40 7.474E-01 *(P 1.967E-01 7.90E-02 G
```

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 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments

TH-227      -8.4598E-03
                          236.00-8.460E-03 &(P 3.700E-01 1.10E-01 G K
                          256.25 4.157E-02 & P 3.904E-01 1.16E-01 G

PA-234       3.1488E-03
                           98.44 3.149E-03 %(  1.465E-01 4.37E-02 G K
                          946.00-2.719E-02 %   1.644E-01 4.78E-02 G
                          131.28-2.910E-02 &   1.757E-01 5.27E-02 G
                           94.67-1.043E-01 %   2.803E-01 8.47E-02 G
                          883.24-2.578E-02 %   1.888E-01 5.37E-02 G
                          926.70 0.000E+00 %   2.894E-01 8.21E-02 G
                          569.26 2.963E-02 &   2.397E-01 6.97E-02 G

TH-234       1.2435E+00
                           63.29 6.073E-01 &(P 1.789E+00 5.38E-01 G K
                           92.80 1.514E+00  (P 1.420E+00 4.37E-01 G
                           92.38 1.893E+00  (P 1.680E+00 5.19E-01 G

AM-241      -1.4773E-02
                           59.54-1.477E-02 &(P 2.410E-01 7.20E-02 G
   ( - This peak used in the nuclide activity average.

   * - Peak is too wide, but only one peak in library.
   ! - Peak is part of a multiplet and this area went
       negative during deconvolution.
   ? - Peak is too narrow.
   @ - Peak is too wide at FW25M, but ok at FWHM.
   % - Peak fails sensitivity test.
   $ - Peak identified, but first peak of this nuclide
       failed one or more qualification tests.
   + - Peak activity higher than counting uncertainty range.
   - - Peak activity lower than counting uncertainty range.
   = - Peak outside analysis energy range.
   & - Calculated peak centroid is not close enough to the
       library energy centroid for positive identification.
   P - Peakbackground subtraction
   } - Peak is too close to another for the activity
       to be found directly.

   Nuclide Codes:                      Peak Codes:
   T - Thermal Neutron Activation      G - Gamma Ray
   F - Fast Neutron Activation         X - X-Ray
   I - Fission Product                 P - Positron Decay
   N - Naturally Occurring Isotope     S - Single-Escape
   P - Photon Reaction                 D - Double-Escape
   C - Charged Particle Reaction       K - Key Line
   M - No MDA Calculation              A - Not in Average
```

R - Coincidence Corrected C - Coincidence Peak
H - Halflife limit exceeded

- -

***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	-3.9437E-02	-4.0900E-02	2.3598E-01	2.3599E-01	2.582E-01
K-40		1.5534E+01	1.5534E+01	1.1935E+00	1.5053E+00	
MN-54	#A	-1.1639E-03	-1.1712E-03	6.7319E-02	6.7319E-02	4.495E-02
CO-57	#B	-6.5241E-03	-6.5713E-03	3.0066E-02	3.0069E-02	3.249E-02
CO-60	#B	-9.6158E-03	-9.6255E-03	7.3924E-02	7.3926E-02	3.844E-02
Sr-85	#A	-1.9462E-02	-2.0055E-02	3.7028E-02	3.7047E-02	3.946E-02
Kr-85	#A	-4.9119E+02	-4.9120E+02	9.5850E+02	9.5894E+02	9.209E+02
Y-88	#B	-1.0465E-03	-1.0658E-03	3.8723E-02	3.8723E-02	2.972E-02
NB-94	#B	4.1461E-03	4.1461E-03	1.8991E-02	1.8992E-02	2.206E-02
Ag-108M	#B	0.0000E+00	0.0000E+00	6.3655E-02	6.3655E-02	7.182E-02
CD-109	#A	2.7408E-02	2.7526E-02	1.1503E+00	1.1503E+00	1.276E+00
SN-113	#B	-2.8496E-03	-2.8981E-03	8.4252E-02	8.4253E-02	4.164E-02
SB-125	#B	7.5753E-02	7.5899E-02	6.1882E-02	6.2045E-02	8.878E-02
I-131	#B	-7.8407E-03	-9.9872E-03	3.3407E-02	3.3413E-02	2.936E-02
CS-134	#B	1.6603E-02	1.6646E-02	1.5600E-02	1.5631E-02	7.697E-02
CS-137	#A	8.5078E-03	8.5094E-03	3.4455E-02	3.4459E-02	3.913E-02
CE-139	#A	-5.1982E-04	-5.2722E-04	5.1825E-02	5.1825E-02	3.879E-02
EU-152	#B	7.3346E-04	7.3376E-04	1.0087E-01	1.0087E-01	1.129E-01
EU-154	#B	1.3750E-02	1.3758E-02	7.2048E-02	7.2052E-02	8.011E-02
EU-155	#A	1.2410E-01	1.2424E-01	1.2949E-01	1.2967E-01	1.404E-01
HG-203	#B	-2.7170E-04	-2.8328E-04	1.0013E-01	1.0013E-01	3.072E-02
TL-208		2.6436E-01	2.6436E-01	5.2418E-02	5.4694E-02	
PB-212		7.8372E-01	7.8372E-01	8.1754E-02	9.3948E-02	
PB-214		4.7346E-01	4.7346E-01	8.4597E-02	8.9099E-02	
BI-212	#	8.0200E-01	8.0200E-01	3.7222E-01	3.7522E-01	
BI-214		5.5902E-01	5.5902E-01	1.1732E-01	1.2188E-01	
RA-224	#A	4.5032E-02	4.5032E-02	9.3436E-01	9.3436E-01	1.044E+00
RA-226	#	1.2642E+00	1.2642E+00	7.8317E-01	7.8673E-01	
AC-228		7.7759E-01	7.7759E-01	1.3082E-01	1.3865E-01	
TH-227	#B	-8.4598E-03	-8.4598E-03	3.8779E-01	3.8779E-01	3.700E-01
PA-234	#B	3.1488E-03	3.1488E-03	1.3106E-01	1.3106E-01	1.465E-01
TH-234	#B	1.2435E+00	1.2435E+00	1.0237E+00	1.0260E+00	1.789E+00
AM-241	#A	-1.4772E-02	-1.4773E-02	2.4611E-01	2.4611E-01	2.409E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.

H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (1120.2 to 2000.1 keV) 2.0458015E+01 pCi/gm
Total Decayed Activity (1120.2 to 2000.1 keV) 2.0458019E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JJM

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

Sample description
OOL-05-03-002-MTP

Spectrum Filename: C:\GammaVision\Spectra\107_1SEP2006_0716.An1

Acquisition information

Start time:	01-Sep-2006 07:16:58
Live time:	2000
Real time:	2002
Dead time:	0.08 %
Detector ID:	2

Detector system
Det 107- DSPE- 634

Calibration

Filename:	D7_1LSa.Clb

Detector 107 Calibration for 1 Liter Sand Marinelli

Energy Calibration

Created:	29-Oct-2004 06:48:53
Zero offset:	0.157 keV
Gain:	0.500 keV/channel
Quadratic:	-1.676E-08 keV/channel^2

Efficiency Calibration

Created:	29-Oct-2004 06:51:32
Type:	Polynomial
Uncertainty:	1.174 %
Coefficients:	-0.279532 -4.778179 0.614896
	-0.087174 0.005356 -0.000131

Library Files

Main analysis library:	FSS_Rev_1.Lib
Library Match Width:	1.000
Peak stripping:	Library based

Analysis parameters

Analysis engine:	Env32 G53W4.20
Start channel:	100 (50.16keV)
Stop channel:	4000 (2000.15keV)
Peak rejection level:	41.667%
Peak search sensitivity:	3
Sample Size:	1.7080E+03
Activity scaling factor:	1.0000E+06/(1.0000E+00* 1.7080E+03) = 5.8548E+02
Detection limit method:	Nureg 4.16
Random error:	1.0000000E+00
Systematic error:	1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	29-Aug-2006 11:00:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	107_150K_28APR05.Pbc 01-May-2005 05:30:33
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 18 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.0894

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
74.65	218.	16.81	1.18	2.842E-02	74.81	9.600	6.183E-01	PB212
77.11	412.	9.43	1.18	2.958E-02	77.11	17.500	6.298E-01	PB212
					77.11	10.700	1.018E+00	PB214
87.07	118.	40.20	1.50	3.284E-02	86.45	32.740	PBC<MDA	EU155
					88.04	3.790	PBC<MDA	CD109
92.62	119.	36.23	2.07	3.434E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
185.99	182.	22.32	1.67	3.610E-02	185.99	3.280	1.218E+00	RA226
209.09	76.	39.83	1.21	3.430E-02				
238.71	822.	4.65	1.30	3.187E-02	238.63	43.100	4.638E-01	PB212
241.83	172.	16.99	1.30	3.162E-02	241.00	3.900	1.086E+00	RA224
					241.92	7.470	5.712E-01	PB214
270.17	96.	37.90	0.80	2.945E-02				
295.24	273.	8.68	1.34	2.768E-02	295.22	19.200	3.994E-01	PB214
300.18	64.	27.41	1.34	2.735E-02				
328.06	88.	37.15	1.56	2.560E-02				
338.60	239.	13.08	1.62	2.499E-02	338.40	12.010	6.204E-01	AC228
351.84	442.	8.14	1.55	2.427E-02	351.99	37.100	3.836E-01	PB214
463.06	58.	31.16	1.21	1.954E-02				
463.06	58.	31.16	1.21	1.954E-02	463.51	10.000	2.261E-01	SB125
510.79	195.	13.89	2.28	1.808E-02	510.72	22.500	3.142E-01	TL208
583.09	331.	8.70	1.13	1.629E-02	583.14	86.000	1.846E-01	TL208
609.25	381.	8.07	1.84	1.574E-02	609.32	46.090	4.107E-01	BI214
661.43	49.	34.05	1.52	1.477E-02	661.62	84.620	2.891E-02	CS137
727.26	112.	18.29	1.89	1.374E-02	727.17	11.800	5.411E-01	BI212
768.58	107.	22.40	1.47	1.318E-02				
795.37	34.	37.00	1.34	1.284E-02				

795.37	34.	37.00	1.34	1.284E-02	795.76	85.400	PBC<MDA	CS134
910.85	239.	9.97	1.75	1.161E-02	911.07	29.000	5.522E-01	AC228
967.36	176.	11.99	1.81	1.111E-02	968.90	17.460	7.102E-01	AC228
1119.92	89.	22.37	1.58	9.972E-03	1120.28	15.040	4.660E-01	BI214
1460.66	1330.	2.83	2.31	8.191E-03	1460.75	10.700	1.196E+01	K40
1764.32	66.	13.17	2.76	7.084E-03	1764.51	15.920	4.596E-01	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
417.82	209.09	370.	76.	0.038	119.50	1.206	AC-228	
539.96	270.17	397.	96.	0.048	113.70	0.799	AC-228	s
599.89	300.13	168.	64.	0.032	97.61	1.534	PB-212	M
655.74	328.06	294.	88.	0.044	111.45	1.560	AC-228	
1322.44	661.43	80.	49.	0.025	102.14	1.521	CS-137	l
1536.72	768.58	115.	107.	0.054	51.30	1.474	BI-214	sM
1590.31	795.37	53.	31.	0.016	112.42	1.342	CS-134	s

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.
M - Peak is close to a library peak.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-212	149.29	74.81	564.	214.	0.107	50.40	1.178D
PB-212	153.89	77.11	549.	265.	0.133	36.26	1.179A
PB-214	153.89	77.11	945.	134.	0.067	94.56	1.500A
EU-155	173.80	87.07	1067.	118.	0.059	120.60	1.500
RA-226	371.62	185.99	546.	182.	0.091	66.96	1.672s
TH-227	471.54	235.95	953.	-128.	-0.064	106.17	1.500s
PB-212	476.89	238.63	280.	800.	0.400	13.49	1.297D
PB-214	483.47	241.92	353.	160.	0.080	54.46	1.299D
PB-214	590.02	295.20	232.	279.	0.140	31.26	1.288s
AC-228	676.81	338.60	241.	235.	0.118	39.23	1.617
PB-214	703.29	351.84	248.	436.	0.218	24.41	1.551s
SB-125	925.57	462.99	117.	57.	0.029	84.84	1.500
TL-208	1021.18	510.79	179.	162.	0.081	41.66	2.278s
TL-208	1165.77	583.09	136.	327.	0.163	26.10	1.131
BI-214	1218.07	609.25	149.	377.	0.188	24.22	1.841
BI-212	1454.09	727.26	87.	111.	0.055	54.87	1.890s
AC-228	1821.27	910.85	91.	235.	0.117	29.92	1.748s
AC-228	1934.28	967.36	75.	174.	0.087	35.97	1.808s
BI-214	2239.40	1119.92	87.	88.	0.044	67.10	1.585
K-40	2920.92	1460.66	23.	1325.	0.662	8.49	2.313
BI-214	3528.30	1764.32	4.	66.	0.033	39.51	2.756s

s - Peak fails shape tests.
D - Peak area deconvoluted.

A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	Peak MDA Value pCi/gm	COMMENTS
BE-7		1.3793E-01					
			477.56	1.379E-01	%(	2.153E-01 6.64E-02	G
K-40		1.1959E+01					
			1460.75	1.196E+01	(P	2.272E-01 3.40E-01	G
MN-54		-8.3667E-03					
			834.81	-8.367E-03	%(P	3.087E-02 9.11E-03	G
CO-57		-7.4551E-06					
			122.07	-7.455E-06	%(P	3.156E-02 9.38E-03	G K
			136.43	8.332E-02	% P	2.395E-01 7.22E-02	G
CO-60		-3.2967E-03					
			1332.51	-3.297E-03	&(P	3.181E-02 8.57E-03	G K
			1173.23	5.452E-03	% P	3.608E-02 1.04E-02	G K
Sr-85		-1.3125E-02					
			514.00	-1.313E-02	&(	3.392E-02 1.02E-02	G
Kr-85		-3.2460E+02					
			513.99	-3.246E+02	&(P	7.643E+02 2.29E+02	G
Y-88		2.5565E-03					
			1836.01	2.556E-03	%(P	1.799E-02 4.69E-03	G K
			898.02	1.017E-02	% P	2.935E-02 8.70E-03	G
NB-94		-6.7904E-04					
			871.10	-6.790E-04	%(P	2.385E-02 6.72E-03	G K
			702.50	-2.991E-04	& P	2.849E-02 8.16E-03	G K
Ag-108M		-1.3173E-03					
			722.95	-1.317E-03	%(	2.835E-02 8.13E-03	G K
			614.37	-2.419E-02	%	3.441E-02 1.06E-02	G
			433.93	-2.647E-03	% P	2.286E-02 6.60E-03	G
CD-109		-5.5690E-02					
			88.04	-5.569E-02	%(P	1.073E+00 3.21E-01	G
SN-113		-1.6767E-03					
			391.71	-1.677E-03	%(P	2.713E-02 7.72E-03	G K
			255.04	4.615E-01	%	1.083E+00 3.27E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	6.9671E-02						
		427.95	1.463E-02	&(P	7.206E-02	2.12E-02	G K
		600.77	-3.697E-03	% P	1.278E-01	3.63E-02	G
		636.15	1.911E-02	& P	2.058E-01	5.93E-02	G
		463.51	2.326E-01	(P	2.158E-01	6.90E-02	G
		176.29	-4.553E-03	& P	2.828E-01	8.28E-02	G
I-131	8.3982E-04						
		364.48	8.398E-04	%(	2.753E-02	7.95E-03	G K
		636.97	4.458E-03	&	4.362E-01	1.25E-01	G
		284.29	2.342E-04	%	4.845E-01	1.42E-01	G
CS-134	-1.3401E-02						
		604.66	-1.340E-02	%(P	3.307E-02	9.94E-03	G K
		795.76	1.347E-03	% P	3.687E-02	1.06E-02	G
		569.29	9.492E-03	%	1.217E-01	3.48E-02	G
		801.84	-2.444E-02	% P	2.688E-01	7.66E-02	G
CS-137	1.5960E-02						
		661.62	1.596E-02	%(P	2.877E-02	8.72E-03	G
CE-139	-2.4208E-03						
		165.85	-2.421E-03	%(P	2.970E-02	8.83E-03	G
EU-152	5.2742E-04						
		121.78	5.274E-04	%(P	8.924E-02	2.65E-02	G K
		344.30	-1.550E-02	% P	8.632E-02	2.55E-02	G
		1408.08	4.683E-02	% P	8.721E-02	2.67E-02	G
		964.00	-4.481E-02	& P	2.799E-01	8.22E-02	G
		1112.07	3.912E-02	% P	2.473E-01	7.18E-02	G
		778.90	-2.596E-02	% P	1.950E-01	5.61E-02	G
EU-154	-4.0878E-03						
		123.10	-4.088E-03	&(P	6.441E-02	1.92E-02	G K
		1274.80	-1.354E-02	& P	8.822E-02	2.53E-02	G
		723.30	-4.047E-02	% P	1.630E-01	4.82E-02	G
		1004.80	2.007E-02	% P	1.482E-01	4.25E-02	G
EU-155	8.6961E-02						
		86.45	8.696E-02	(	1.141E-01	3.50E-02	G K
		105.31	1.903E-03	% P	1.229E-01	3.65E-02	G
HG-203	-1.2043E-03						
		279.17	-1.204E-03	&(P	3.163E-02	9.31E-03	G K
		72.87	-2.469E-01	% P	9.024E-01	2.72E-01	G
		70.83	1.487E-01	%	1.484E+00	4.45E-01	G
		82.50	-3.477E-01	&	1.784E+00	5.36E-01	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments

TL-208       1.8460E-01
                          583.14 1.846E-01  (P 3.224E-02 1.63E-02 G
                          510.72 3.142E-01 + P 1.267E-01 5.27E-02 G

PB-212       4.6031E-01
                          238.63 4.603E-01  (P 4.646E-02 2.11E-02 G K
                                                          Energy duplication
                           77.11 4.054E-01 }   1.711E-01 4.90E-02 G
                           74.81 6.186E-01 + P 3.280E-01 1.06E-01 G

PB-214       3.9461E-01
                          351.99 3.836E-01 @(P 6.685E-02 3.16E-02 G K
                          295.22 4.158E-01 *(P 1.097E-01 4.40E-02 G
                                                          Energy duplication
                           77.11 3.354E-01 } P 3.649E-01 1.06E-01 G
                          241.92 5.374E-01 + P 3.020E-01 9.84E-02 G

BI-212       5.4113E-01
                          727.17 5.411E-01 *(P 2.254E-01 1.00E-01 G K
                         1620.56 7.357E-02 % P 8.375E-01 2.28E-01 G
                          785.42 7.035E-01 % P 1.318E+00 4.01E-01 G

BI-214       4.3162E-01
                          609.32 4.107E-01  (P 6.505E-02 3.35E-02 G K
                         1764.51 4.596E-01  (P 8.834E-02 6.14E-02 G
                         1120.28 4.660E-01  (P 2.432E-01 1.05E-01 G

RA-224       5.8144E-01
                          241.00 5.814E-01 %(P 8.525E-01 2.61E-01 G

RA-226       1.2181E+00
                          185.99 1.218E+00 *(  7.455E-01 2.72E-01 G

AC-228       6.1343E-01
                          911.07 5.522E-01 @(P 1.109E-01 5.61E-02 G K
                          968.90 7.102E-01 *(P 1.761E-01 8.62E-02 G
                          338.40 6.204E-01  (P 1.976E-01 8.23E-02 G

TH-227      -2.8096E-01
                          236.00-2.810E-01 &(P 3.225E-01 9.92E-02 G K
                          256.25 1.080E-01 & P 3.485E-01 1.04E-01 G

PA-234       4.0389E-02
                           98.44 4.039E-02 %(  1.188E-01 3.58E-02 G K
                          946.00 4.529E-02 %   1.420E-01 4.21E-02 G
                          131.28 2.958E-02 &   1.359E-01 4.08E-02 G
                           94.67-9.274E-02 %   2.341E-01 7.08E-02 G
                          883.24 3.027E-02 &   1.894E-01 5.45E-02 G
                          926.70-6.418E-03 %   2.331E-01 6.59E-02 G
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 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26 1.417E-02 %   1.800E-01 5.15E-02 G

TH-234      -1.5879E-01
                           63.29-1.588E-01 %(P 1.197E+00 3.51E-01 G K
                           92.80 7.762E-01 % P 1.171E+00 3.56E-01 G
                           92.38 1.008E+00 % P 1.380E+00 4.22E-01 G

AM-241       3.0240E-02
                           59.54 3.024E-02 %(P 1.795E-01 5.37E-02 G
   ( - This peak used in the nuclide activity average.

   * - Peak is too wide, but only one peak in library.
   ! - Peak is part of a multiplet and this area went
       negative during deconvolution.
   ? - Peak is too narrow.
   @ - Peak is too wide at FW25M, but ok at FWHM.
   % - Peak fails sensitivity test.
   $ - Peak identified, but first peak of this nuclide
       failed one or more qualification tests.
   + - Peak activity higher than counting uncertainty range.
   - - Peak activity lower than counting uncertainty range.
   = - Peak outside analysis energy range.
   & - Calculated peak centroid is not close enough to the
       library energy centroid for positive identification.
   P - Peakbackground subtraction
   } - Peak is too close to another for the activity
       to be found directly.

   Nuclide Codes:                      Peak Codes:
   T - Thermal Neutron Activation      G - Gamma Ray
   F - Fast Neutron Activation         X - X-Ray
   I - Fission Product                 P - Positron Decay
   N - Naturally Occurring Isotope     S - Single-Escape
   P - Photon Reaction                 D - Double-Escape
   C - Charged Particle Reaction       K - Key Line
   M - No MDA Calculation              A - Not in Average
   R - Coincidence Corrected           C - Coincidence Peak
   H - Halflife limit exceeded

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
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***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	1.3293E-01	1.3793E-01	1.9919E-01	1.9935E-01	2.075E-01
K-40		1.1959E+01	1.1959E+01	1.0193E+00	1.2401E+00	
MN-54	#A	-8.3141E-03	-8.3667E-03	2.9194E-02	2.9198E-02	3.068E-02
CO-57	#B	-7.4009E-06	-7.4551E-06	3.5090E-02	3.5090E-02	3.133E-02
CO-60	#B	-3.2933E-03	-3.2967E-03	1.7135E+00	1.7135E+00	3.178E-02

Sr-85	#A	-1.2732E-02	-1.3125E-02	3.0648E-02	3.0658E-02	3.290E-02
Kr-85	#A	-3.2459E+02	-3.2460E+02	8.2925E+02	8.2947E+02	7.642E+02
Y-88	#B	2.5096E-03	2.5565E-03	1.4079E-02	1.4079E-02	1.766E-02
NB-94	#B	-6.7904E-04	-6.7904E-04	2.6283E-02	2.6283E-02	2.385E-02
Ag-108M	#B	-1.3173E-03	-1.3173E-03	2.4398E-02	2.4399E-02	2.834E-02
CD-109	#A	-5.5448E-02	-5.5690E-02	1.0354E+00	1.0354E+00	1.069E+00
SN-113	#B	-1.6482E-03	-1.6767E-03	9.4979E-02	9.4979E-02	2.667E-02
SB-125	#B	6.9535E-02	6.9671E-02	6.2008E-02	6.2144E-02	7.192E-02
I-131	#B	6.5714E-04	8.3982E-04	2.3845E-02	2.3845E-02	2.154E-02
CS-134	#B	-1.3366E-02	-1.3401E-02	3.1051E-02	3.1061E-02	3.298E-02
CS-137	#A	1.5957E-02	1.5960E-02	2.6170E-02	2.6187E-02	2.876E-02
CE-139	#A	-2.3863E-03	-2.4208E-03	2.8557E-02	2.8557E-02	2.928E-02
EU-152	#B	5.2720E-04	5.2742E-04	7.9501E-02	7.9501E-02	8.920E-02
EU-154	#B	-4.0852E-03	-4.0878E-03	6.5912E-02	6.5913E-02	6.437E-02
EU-155	#A	8.6866E-02	8.6961E-02	1.0488E-01	1.0499E-01	1.140E-01
HG-203	#B	-1.1544E-03	-1.2043E-03	6.1893E-02	6.1893E-02	3.032E-02
TL-208		1.8460E-01	1.8460E-01	4.8855E-02	5.0057E-02	
PB-212		4.6031E-01	4.6031E-01	6.3312E-02	6.8902E-02	
PB-214		3.9461E-01	3.9461E-01	7.9388E-02	8.2739E-02	
BI-212	#	5.4113E-01	5.4113E-01	3.0035E-01	3.0205E-01	
BI-214		4.3162E-01	4.3162E-01	1.0576E-01	1.0879E-01	
RA-224	#A	5.8144E-01	5.8144E-01	7.8154E-01	7.8229E-01	8.525E-01
RA-226	#	1.2181E+00	1.2181E+00	8.1563E-01	8.1879E-01	
AC-228		6.1343E-01	6.1343E-01	1.2665E-01	1.3173E-01	
TH-227	#A	-2.8096E-01	-2.8096E-01	2.9892E-01	2.9938E-01	3.225E-01
PA-234	#B	4.0389E-02	4.0389E-02	1.0744E-01	1.0747E-01	1.188E-01
TH-234	#B	-1.5879E-01	-1.5879E-01	5.4031E+01	5.4031E+01	1.197E+00
AM-241	#A	3.0240E-02	3.0240E-02	1.6116E-01	1.6117E-01	1.795E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (269.7 to 2000.1 keV) 1.5802963E+01 pCi/gm
Total Decayed Activity (269.7 to 2000.1 keV) 1.5802967E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JJM

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 107_1SEP2006_0801.An1

Sample description
OOL-05-03-005-MTP

Spectrum Filename: C:\GammaVision\Spectra\107_1SEP2006_0801.An1

Acquisition information
Start time: 01-Sep-2006 08:01:16
Live time: 2000
Real time: 2002
Dead time: 0.10 %
Detector ID: 2

Detector system
Det 107- DSPE- 634

Calibration
Filename: D7_1LSa.Clb
Detector 107 Calibration for 1 Liter Sand Marinelli

Energy Calibration
Created: 29-Oct-2004 06:48:53
Zero offset: 0.157 keV
Gain: 0.500 keV/channel
Quadratic: -1.676E-08 keV/channel^2

Efficiency Calibration
Created: 29-Oct-2004 06:51:32
Type: Polynomial
Uncertainty: 1.174 %
Coefficients: -0.279532 -4.778179 0.614896
-0.087174 0.005356 -0.000131

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.16keV)
Stop channel: 4000 (2000.15keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 1.4080E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.4080E+03) =
7.1023E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	29-Aug-2006 11:15:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	107_150K_28APR05.Pbc 01-May-2005 05:30:33
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 22 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.0718

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
74.94	288.	20.80	1.50	2.849E-02				
74.94	288.	20.80	1.50	2.849E-02	74.81	9.600	1.010E+00	PB212
77.04	420.	13.91	1.50	2.957E-02				
77.04	420.	13.91	1.50	2.957E-02	77.11	17.500	7.791E-01	PB212
					77.11	10.700	1.260E+00	PB214
77.04	415.	13.91	1.50	2.957E-02				
77.04	415.	13.91	1.50	2.957E-02	77.11	17.500	7.703E-01	PB212
					77.11	10.700	1.260E+00	PB214
86.88	200.	17.83	1.19	3.291E-02	86.45	32.740	1.785E-01	EU155
					88.04	3.790	1.525E+00	CD109
90.19	124.	27.00	1.19	3.375E-02				
93.38	193.	17.93	1.19	3.447E-02	92.38	2.570	2.015E+00	TH234
					92.80	3.000	1.612E+00	TH234
129.38	114.	39.80	1.47	3.819E-02				
185.84	250.	15.55	1.70	3.611E-02	185.99	3.280	2.022E+00	RA226
238.63	1219.	3.58	1.30	3.188E-02	238.63	43.100	8.404E-01	PB212
241.49	198.	19.52	1.30	3.165E-02	241.00	3.900	1.521E+00	RA224
					241.92	7.470	7.989E-01	PB214
270.19	130.	25.90	1.70	2.945E-02				
277.34	55.	41.60	1.50	2.879E-02	279.17	81.500	PBC<MDA	HG203
295.37	285.	8.55	1.34	2.767E-02	295.22	19.200	5.071E-01	PB214
300.36	69.	27.74	1.34	2.733E-02				
327.50	64.	38.64	1.50	2.563E-02				
338.33	322.	11.04	1.70	2.501E-02	338.40	12.010	1.018E+00	AC228
351.95	480.	6.30	1.37	2.426E-02				
351.95	480.	6.30	1.37	2.426E-02	351.99	37.100	5.064E-01	PB214
409.23	65.	28.51	1.51	2.156E-02				

462.81	81.	26.99	2.01	1.955E-02				
462.81	81.	26.99	2.01	1.955E-02	463.51	10.000	3.841E-01	SB125
510.69	203.	15.21	1.81	1.808E-02	510.72	22.500	3.986E-01	TL208
583.15	387.	7.15	1.44	1.629E-02	583.14	86.000	2.622E-01	TL208
609.46	325.	7.86	1.56	1.574E-02	609.32	46.090	4.242E-01	BI214
727.32	111.	19.08	1.08	1.374E-02	727.17	11.800	6.470E-01	BI212
794.29	39.	33.52	1.68	1.284E-02	795.76	85.400	PBC<MDA	CS134
911.06	283.	8.43	1.64	1.161E-02	911.07	29.000	7.948E-01	AC228
964.15	54.	22.06	1.80	1.113E-02				
968.84	149.	10.85	1.80	1.109E-02	968.90	17.460	7.270E-01	AC228
1120.79	145.	19.17	1.92	9.967E-03	1120.28	15.040	9.212E-01	BI214

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
1460.58	1505.	2.61	2.10	8.192E-03	1460.75	10.700	1.643E+01	K40
1620.70	37.	22.18	1.17	7.569E-03	1620.56	2.750	1.711E+00	BI212
1764.22	69.	13.04	1.79	7.084E-03	1764.51	15.920	5.864E-01	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
173.43	86.70	534.	200.	0.100	53.50	1.187	BI-207	D
180.05	90.01	496.	124.	0.062	81.01	1.189	PB-214	D
186.42	93.19	502.	193.	0.096	53.78	1.191	U-235	D
258.43	129.38	723.	133.	0.067	89.61	1.470	AC-228	s
476.90	238.77	342.	1219.	0.610	10.73	1.297	PB-212	D
482.60	241.62	649.	198.	0.099	58.56	1.299	PB-214	D
540.01	270.19	348.	130.	0.065	77.69	1.700	AC-228	s
600.37	300.38	256.	64.	0.032	123.56	1.086	PB-212	
654.61	327.50	219.	64.	0.032	115.91	1.503	AC-228	
818.07	409.23	118.	65.	0.033	85.53	1.507	AC-228	s
1927.75	964.15	44.	53.	0.026	67.95	1.796	EU-152	D

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
HG-203	146.37	73.35	1533.	-145.	-0.073	116.93	1.500s
PB-212	149.55	74.94	1700.	288.	0.144	62.41	1.500s
PB-212	153.89	77.11	1497.	420.	0.210	41.72	1.500D
PB-214	153.89	77.11	1501.	415.	0.208	41.72	1.500D
EU-155	173.90	87.12	1297.	178.	0.089	88.65	1.500
TH-234	185.94	93.14	1169.	171.	0.085	78.65	1.500
RA-226	371.32	185.84	502.	250.	0.125	46.66	1.699s
TH-227	471.73	236.05	1067.	-122.	-0.061	117.08	1.500s
PB-212	476.95	238.66	701.	1177.	0.588	12.73	1.500s
PB-214	590.35	295.36	309.	288.	0.144	30.82	1.500
AC-228	676.28	338.33	288.	319.	0.159	33.13	1.705s
PB-214	703.59	351.99	182.	467.	0.233	18.28	1.500s
SB-125	925.48	462.94	145.	73.	0.037	74.77	1.500s
TL-208	1020.96	510.69	225.	169.	0.084	45.62	1.815s
TL-208	1165.87	583.15	123.	383.	0.191	21.46	1.437

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
BI-214	1218.50	609.46	121.	321.	0.160	23.58	1.565
BI-212	1454.21	727.32	100.	109.	0.055	57.23	1.085s
CS-134	1588.15	794.29	70.	39.	0.020	100.56	1.684
AC-228	1821.69	911.06	88.	279.	0.139	25.28	1.635s
AC-228	1937.36	968.90	58.	147.	0.073	32.56	1.799D
BI-214	2241.15	1120.79	134.	144.	0.072	57.52	1.918s
K-40	2920.75	1460.58	16.	1500.	0.750	7.84	2.097
BI-212	3241.02	1620.70	9.	37.	0.019	66.53	1.172s
BI-214	3528.10	1764.22	5.	69.	0.034	39.11	1.785s

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	Peak MDA Value pCi/gm	COMMENTS
BE-7		4.9232E-02					
			477.56	4.923E-02	%(	2.314E-01 6.79E-02	G
K-40		1.6427E+01					
			1460.75	1.643E+01	(P	2.333E-01 4.31E-01	G
MN-54		2.8446E-03					
			834.81	2.845E-03	&(P	3.751E-02 1.08E-02	G
CO-57		3.7653E-04					
			122.07	3.765E-04	%(P	4.132E-02 1.23E-02	G K
			136.43	5.507E-02	& P	3.296E-01 9.87E-02	G
CO-60		5.7253E-03					
			1332.51	5.725E-03	%(P	3.585E-02 1.01E-02	G K
			1173.23	-2.028E-02	% P	5.112E-02 1.50E-02	G K
Sr-85		-1.8747E-02					
			514.00	-1.875E-02	&(	4.235E-02 1.28E-02	G
Kr-85		-4.5686E+02					
			513.99	-4.569E+02	&(P	9.537E+02 2.87E+02	G
Y-88		-5.0662E-03					
			1836.01	-5.066E-03	&(P	3.187E-02 8.62E-03	G K
			898.02	1.430E-03	% P	3.232E-02 9.08E-03	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
NB-94	1.3853E-02						
		871.10	1.385E-02	%(P	2.680E-02	8.18E-03	G K
		702.50	-9.393E-03	% P	3.215E-02	9.50E-03	G K
Ag-108M	-1.6561E-02						
		722.95	-1.656E-02	%(	4.224E-02	1.27E-02	G K
		614.37	-1.369E-02	%	3.942E-02	1.18E-02	G
		433.93	-1.978E-03	% P	3.409E-02	9.90E-03	G
CD-109	-1.5709E-01						
		88.04	-1.571E-01	%(P	1.354E+00	4.06E-01	G
SN-113	4.2240E-03						
		391.71	4.224E-03	%(P	4.658E-02	1.37E-02	G K
		255.04	-1.883E-01	&	1.481E+00	4.40E-01	G
SB-125	8.9058E-02						
		427.95	-2.744E-03	&(P	9.527E-02	2.75E-02	G K
		600.77	-7.289E-03	& P	1.300E-01	3.65E-02	G
		636.15	5.201E-02	% P	2.486E-01	7.27E-02	G
		463.51	3.608E-01	(P	2.892E-01	9.34E-02	G
		176.29	1.074E-01	% P	4.745E-01	1.42E-01	G
I-131	-9.6401E-05						
		364.48	-9.640E-05	&(	4.518E-02	1.32E-02	G K
		636.97	1.129E-01	&	4.612E-01	1.36E-01	G
		284.29	1.020E-01	%	5.732E-01	1.70E-01	G
CS-134	2.2533E-02						
		604.66	1.205E-02	%(P	2.980E-02	8.95E-03	G K
		795.76	3.451E-02	(P	3.655E-02	1.17E-02	G
		569.29	-2.106E-02	%	1.826E-01	5.31E-02	G
		801.84	-2.308E-03	& P	4.129E-01	1.18E-01	G
CS-137	1.7126E-02						
		661.62	1.713E-02	&(P	3.632E-02	1.09E-02	G
CE-139	-8.0367E-04						
		165.85	-8.037E-04	%(P	4.338E-02	1.29E-02	G
EU-152	-2.9809E-04						
		121.78	-2.981E-04	%(P	1.170E-01	3.48E-02	G K
		344.30	-1.988E-02	% P	1.062E-01	3.14E-02	G
		1408.08	2.133E-02	% P	1.429E-01	4.01E-02	G
		964.00	-6.763E-03	& P	2.915E-01	8.38E-02	G
		1112.07	-5.272E-02	& P	2.920E-01	8.46E-02	G
		778.90	-1.636E-02	% P	3.518E-01	1.02E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
EU-154	2.8911E-02						
		123.10	2.891E-02	&(P	8.710E-02	2.63E-02	G K
		1274.80	2.663E-02	& P	1.065E-01	3.11E-02	G
		723.30	-8.184E-02	% P	1.956E-01	5.88E-02	G
		1004.80	3.162E-02	& P	1.766E-01	5.10E-02	G
EU-155	1.5925E-01						
		86.45	1.592E-01	(	1.524E-01	4.71E-02	G K
		105.31	4.959E-02	% P	1.680E-01	5.06E-02	G
HG-203	2.3378E-02						
		279.17	2.338E-02	&(P	3.231E-02	9.96E-03	G K
		72.87	-4.442E-01	% P	1.238E+00	3.74E-01	G
		70.83	-1.576E+00	-	2.007E+00	6.14E-01	G
		82.50	1.751E-02	%	2.367E+00	7.07E-01	G
TL-208	2.6216E-01						
		583.14	2.622E-01	(P	3.731E-02	1.90E-02	G
		510.72	3.986E-01	+ P	1.713E-01	7.27E-02	G
PB-212	8.0938E-01						
		238.63	8.217E-01	@(P	8.802E-02	3.53E-02	G K
							Energy duplication
		77.11	7.791E-01	*(	3.394E-01	1.08E-01	G
		74.81	1.010E+00	+ P	6.836E-01	2.13E-01	G
PB-214	5.0503E-01						
		351.99	4.976E-01	@(P	6.999E-02	3.07E-02	G K
		295.22	5.194E-01	(P	1.528E-01	5.42E-02	G
							Energy duplication
		77.11	1.260E+00	+ P	5.559E-01	1.77E-01	G
		241.92	3.208E-03	% P	6.529E-01	1.95E-01	G
BI-212	6.4696E-01						
		727.17	6.470E-01	(P	2.914E-01	1.25E-01	G K
		1620.56	1.711E+00	+ P	7.661E-01	3.84E-01	G
		785.42	5.143E-01	% P	1.852E+00	5.48E-01	G
BI-214	4.2419E-01						
		609.32	4.242E-01	(P	7.148E-02	3.38E-02	G K
		1764.51	5.864E-01	+ P	1.126E-01	7.74E-02	G
		1120.28	9.212E-01	+ P	3.627E-01	1.78E-01	G
RA-224	7.1627E-01						
		241.00	7.163E-01	%(P	1.097E+00	3.35E-01	G
RA-226	2.0223E+00						
		185.99	2.022E+00	*(	8.686E-01	3.14E-01	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments

AC-228       7.6922E-01
                          911.07 7.948E-01  (P 1.325E-01 6.80E-02 G K
                          968.90 7.267E-01  (P 1.898E-01 8.01E-02 G
                          338.40 1.018E+00 + P 2.616E-01 1.14E-01 G

TH-227      -3.2546E-01
                          236.00-3.255E-01 &(P 4.134E-01 1.27E-01 G K
                          256.25 5.834E-02 & P 4.137E-01 1.23E-01 G

PA-234       2.2960E-03
                           98.44 2.296E-03 %(  1.561E-01 4.65E-02 G K
                          946.00-5.099E-02 %   1.955E-01 5.77E-02 G
                          131.28-2.443E-02 &   1.773E-01 5.31E-02 G
                           94.67-1.154E-01 %   3.017E-01 9.12E-02 G
                          883.24-2.878E-04 %   2.623E-01 7.41E-02 G
                          926.70 6.893E-02 &   2.909E-01 8.52E-02 G
                          569.26-3.122E-02 %   2.702E-01 7.86E-02 G

TH-234       9.7827E-01
                           63.29 5.097E-01 %(P 2.052E+00 6.16E-01 G K
                           92.80 1.587E+00  (P 1.508E+00 4.64E-01 G
                           92.38-6.365E-02 % P 1.839E+00 5.48E-01 G

AM-241      -5.6092E-02
                           59.54-5.609E-02 %(P 2.626E-01 7.89E-02 G
   ( - This peak used in the nuclide activity average.

   * - Peak is too wide, but only one peak in library.
   ! - Peak is part of a multiplet and this area went
       negative during deconvolution.
   ? - Peak is too narrow.
   @ - Peak is too wide at FW25M, but ok at FWHM.
   % - Peak fails sensitivity test.
   $ - Peak identified, but first peak of this nuclide
       failed one or more qualification tests.
   + - Peak activity higher than counting uncertainty range.
   - - Peak activity lower than counting uncertainty range.
   = - Peak outside analysis energy range.
   & - Calculated peak centroid is not close enough to the
       library energy centroid for positive identification.
   P - Peakbackground subtraction
   } - Peak is too close to another for the activity
       to be found directly.

   Nuclide Codes:                      Peak Codes:
   T - Thermal Neutron Activation      G - Gamma Ray
   F - Fast Neutron Activation         X - X-Ray
```

I - Fission Product
N - Naturally Occurring Isotope
P - Photon Reaction
C - Charged Particle Reaction
M - No MDA Calculation
R - Coincidence Corrected
H - Halflife limit exceeded

P - Positron Decay
S - Single-Escape
D - Double-Escape
K - Key Line
A - Not in Average
C - Coincidence Peak

- -

***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	4.7434E-02	4.9232E-02	2.0373E-01	2.0375E-01	2.229E-01
K-40		1.6427E+01	1.6427E+01	1.2923E+00	1.6160E+00	
MN-54	#A	2.8265E-03	2.8446E-03	3.2497E-02	3.2498E-02	3.727E-02
CO-57	#B	3.7377E-04	3.7653E-04	3.6893E-02	3.6893E-02	4.102E-02
CO-60	#B	5.7194E-03	5.7253E-03	3.0204E-02	3.0206E-02	3.582E-02
Sr-85	#A	-1.8181E-02	-1.8747E-02	3.8428E-02	3.8444E-02	4.107E-02
Kr-85	#A	-4.5685E+02	-4.5686E+02	1.0126E+03	1.0129E+03	9.537E+02
Y-88	#B	-4.9726E-03	-5.0662E-03	4.1338E-02	4.1339E-02	3.128E-02
NB-94	#B	1.3853E-02	1.3853E-02	2.4529E-02	2.4543E-02	2.680E-02
Ag-108M	#B	-1.6560E-02	-1.6561E-02	3.8092E-02	3.8104E-02	4.223E-02
CD-109	#A	-1.5640E-01	-1.5709E-01	1.2567E+00	1.2567E+00	1.348E+00
SN-113	#B	4.1518E-03	4.2240E-03	4.0952E-02	4.0953E-02	4.579E-02
SB-125	#B	8.8884E-02	8.9058E-02	6.9142E-02	6.9342E-02	9.509E-02
I-131	#B	-7.5300E-05	-9.6401E-05	3.9564E-02	3.9564E-02	3.529E-02
CS-134	#B	2.2474E-02	2.2533E-02	2.2964E-02	2.3002E-02	2.973E-02
CS-137	#A	1.7123E-02	1.7126E-02	3.2727E-02	3.2743E-02	3.631E-02
CE-139	#A	-7.9214E-04	-8.0367E-04	5.1127E-02	5.1127E-02	4.276E-02
EU-152	#B	-2.9796E-04	-2.9809E-04	2.4438E-01	2.4438E-01	1.170E-01
EU-154	#B	2.8893E-02	2.8911E-02	7.8787E-02	7.8803E-02	8.705E-02
EU-155	#	1.5907E-01	1.5925E-01	1.4116E-01	1.4144E-01	1.522E-01
HG-203	#B	2.2403E-02	2.3378E-02	2.9868E-02	2.9900E-02	3.096E-02
TL-208		2.6216E-01	2.6216E-01	5.6934E-02	5.9001E-02	
PB-212	#	8.0938E-01	8.0938E-01	1.0445E-01	1.1487E-01	8.802E-02
PB-214	#	5.0503E-01	5.0503E-01	9.1793E-02	9.6517E-02	6.999E-02
BI-212		6.4696E-01	6.4696E-01	3.7462E-01	3.7656E-01	
BI-214		4.2419E-01	4.2419E-01	1.0138E-01	1.0443E-01	
RA-224	#A	7.1627E-01	7.1627E-01	1.0044E+00	1.0053E+00	1.097E+00
RA-226	#	2.0223E+00	2.0223E+00	9.4355E-01	9.5108E-01	
AC-228		7.6922E-01	7.6922E-01	1.6095E-01	1.6724E-01	
TH-227	#A	-3.2546E-01	-3.2546E-01	3.8190E-01	3.8238E-01	4.134E-01
PA-234	#B	2.2960E-03	2.2960E-03	1.3952E-01	1.3952E-01	1.561E-01
TH-234	#B	9.7827E-01	9.7827E-01	8.5836E-01	8.6007E-01	2.052E+00
AM-241	#A	-5.6092E-02	-5.6092E-02	2.4568E-01	2.4570E-01	2.626E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (1120.2 to 2000.1 keV) 2.0551800E+01 pCi/gm
Total Decayed Activity (1120.2 to 2000.1 keV) 2.0551807E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JJM

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 107_5SEPT2006_1108.An1

Sample description
OOL-05-03-009-F-S WET

Spectrum Filename: C:\GammaVision\Spectra\107_5SEPT2006_1108.An1

Acquisition information
Start time: 05-Sep-2006 11:08:44
Live time: 2000
Real time: 2006
Dead time: 0.31 %
Detector ID: 2

Detector system
Det 107- DSPE- 634

Calibration
Filename: D7_1LSa.Clb
Detector 107 Calibration for 1 Liter Sand Marinelli

Energy Calibration
Created: 29-Oct-2004 06:48:53
Zero offset: 0.157 keV
Gain: 0.500 keV/channel
Quadratic: -1.676E-08 keV/channel^2

Efficiency Calibration
Created: 29-Oct-2004 06:51:32
Type: Polynomial
Uncertainty: 1.174 %
Coefficients: -0.279532 -4.778179 0.614896
-0.087174 0.005356 -0.000131

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.16keV)
Stop channel: 4000 (2000.15keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 1.4510E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.4510E+03) =
6.8918E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	01-Sep-2006 08:10:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	107_150K_28APR05.Pbc 01-May-2005 05:30:33
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 6 cutoff 20.00000 %

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
73.75	162.	34.37	1.50	2.747E-02	72.87	6.400	PBC<MDA	HG203
75.99	227.	24.22	1.50	2.849E-02	74.81	9.600	7.734E-01	PB212
76.17	179.	22.54	1.14	2.915E-02	74.81	9.600	PBC<MDA	PB212
86.56	138.	35.80	1.00	3.287E-02	86.45	32.740	1.197E-01	EU155
					88.04	3.790	PBC<MDA	CD109
91.89	108.	37.34	1.65	3.419E-02				
91.89	108.	37.34	1.65	3.419E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
128.11	111.	33.31	1.54	3.816E-02				
183.14	205.	21.09	1.81	3.631E-02				
206.42	68.	37.06	1.27	3.451E-02				
235.54	1257.	4.74	1.77	3.214E-02				
235.54	1257.	4.74	1.77	3.214E-02	236.00	11.200	3.255E+00	TH227
291.09	165.	20.95	1.60	2.796E-02				
333.98	289.	11.21	1.64	2.525E-02				
346.92	382.	9.09	2.00	2.453E-02				
457.24	85.	26.59	1.04	1.974E-02				
503.49	211.	14.37	2.38	1.829E-02				
575.03	382.	6.99	1.93	1.647E-02				
600.72	282.	9.42	1.94	1.592E-02				
600.72	282.	9.42	1.94	1.592E-02	600.77	18.400	8.956E-01	SB125
652.28	504.	6.50	2.25	1.493E-02				
716.71	102.	18.99	1.66	1.389E-02				
783.08	49.	37.13	1.00	1.299E-02				
897.95	286.	9.30	1.93	1.173E-02				
897.95	286.	9.30	1.93	1.173E-02	898.02	94.000	2.464E-01	Y88
954.18	207.	9.82	1.83	1.122E-02				
1103.93	81.	24.47	1.88	1.008E-02				
1439.84	1126.	3.03	2.21	8.280E-03				

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
255.87	128.11	483.	147.	0.073	68.14	1.539	AC-228	s
365.92	183.14	549.	252.	0.126	43.73	1.812	MO-99	s
412.70	206.53	300.	80.	0.040	97.79	1.726	U-235	s
470.72	235.54	1568.	310.	0.155	56.76	1.771	J-134	s
581.80	291.09	287.	231.	0.116	36.79	1.602	CE-143	s
667.58	333.98	188.	324.	0.162	24.50	1.637	NP-239	s
693.45	346.92	162.	455.	0.227	18.42	2.004	HF-181	s
914.08	457.24	129.	98.	0.049	57.89	1.037	PA-234	s
1006.57	503.49	168.	217.	0.108	32.58	2.383	J-132	s
1149.65	575.03	114.	382.	0.191	19.40	1.934	PA-234	s
1304.14	652.28	139.	505.	0.252	16.64	2.249	SR-91	s

Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM	Suspected	
1432.98	716.71	86.	102.	0.051	48.57	1.656	RH-106M	s
1565.73	783.08	73.	61.	0.030	71.27	1.004	-	s
1795.46	897.95	302.	71.	0.036	108.98	1.926	Y-88	s
1907.93	954.18	53.	211.	0.106	25.25	1.832	SB-126	s
2207.43	1103.93	76.	83.	0.041	55.79	1.881	J-135	s
2879.28	1439.84	10.	1126.	0.563	9.08	2.214	J-132	s

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
HG-203	147.17	73.75	1500.	162.	0.081	103.10	1.500s
PB-212	151.64	75.99	1454.	227.	0.114	72.66	1.500s
PB-212	153.89	77.11	1769.	-179.	-0.089	102.21	1.500D
PB-214	153.89	77.11	1774.	-184.	-0.092	102.21	1.500D
CD-109	171.48	85.91	845.	105.	0.052	120.93	1.500s
TH-234	183.24	91.79	959.	126.	0.063	100.98	1.500s
TH-227	470.19	235.28	563.	946.	0.473	14.43	1.500s
SB-125	1201.17	600.80	105.	241.	0.121	26.26	1.552s
CS-134	1205.56	602.99	280.	-70.	-0.035	107.61	1.555s
Y-88	1795.93	898.18	70.	213.	0.106	26.22	1.752s

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	Peak MDA Value pCi/gm	COMMENTS
BE-7		-5.1344E-02					
			477.56	-5.134E-02	%(	2.856E-01 8.41E-02	G
K-40		-5.0255E-02					
			1460.75	-5.026E-02	%(P	2.886E-01 7.17E-02	G
MN-54		-1.9129E-03					
			834.81	-1.913E-03	%(P	2.723E-02 7.69E-03	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CO-57	1.0440E-03						
		122.07	1.044E-03	%(P	3.668E-02	1.09E-02	G K
		136.43	-6.806E-02	% P	2.660E-01	7.98E-02	G
CO-60	2.7318E-03						
		1332.51	2.732E-03	&(P	2.923E-02	7.91E-03	G K
		1173.23	-5.625E-03	% P	5.065E-02	1.44E-02	G K
Sr-85	-3.0330E-03						
		514.00	-3.033E-03	%(	2.433E-02	7.05E-03	G
Kr-85	-1.0392E+02						
		513.99	-1.039E+02	%(P	5.469E+02	1.56E+02	G
Y-88	8.9048E-02						
		1836.01	-1.141E-03	&(P	1.034E-02	1.40E-03	G K
		898.02	1.844E-01	@(P	3.607E-02	1.62E-02	G
NB-94	1.6052E-03						
		871.10	1.605E-03	&(P	3.122E-02	8.90E-03	G K
		702.50	-2.626E-04	& P	2.952E-02	8.39E-03	G K
Ag-108M	-2.5023E-04						
		722.95	-2.502E-04	%(	2.817E-02	7.95E-03	G K
		614.37	-7.752E-03	%	3.108E-02	9.17E-03	G
		433.93	-4.487E-03	% P	3.277E-02	9.58E-03	G
CD-109	7.7890E-01						
		88.04	7.789E-01	&(P	1.027E+00	3.15E-01	G
SN-113	-5.8653E-04						
		391.71	-5.865E-04	&(P	4.442E-02	1.29E-02	G K
		255.04	1.529E-01	%	1.198E+00	3.54E-01	G
SB-125	2.8652E-01						
		427.95	-1.346E-02	%(P	8.609E-02	2.51E-02	G K
		600.77	7.691E-01	*(P	1.613E-01	6.77E-02	G
		636.15	-4.556E-03	& P	2.115E-01	5.94E-02	G
		463.51	-7.895E-02	% P	2.705E-01	7.93E-02	G
		176.29	-1.208E-01	% P	4.879E-01	1.46E-01	G
I-131	5.0313E-03						
		364.48	5.031E-03	%(	4.499E-02	1.32E-02	G K
		636.97	7.859E-02	&	4.598E-01	1.33E-01	G
		284.29	1.796E-02	&	6.053E-01	1.78E-01	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments

CS-134      -4.2635E-02
                          604.66-4.264E-02 ?(P 4.884E-02 1.52E-02 G K
                          795.76 4.056E-03 & P 2.722E-02 7.76E-03 G
                          569.29-2.029E-03 %   1.985E-01 5.73E-02 G
                          801.84-4.256E-02 % P 2.924E-01 8.37E-02 G

CS-137      -2.9297E-03
                          661.62-2.930E-03 %(P 3.421E-02 9.58E-03 G

CE-139      -9.1187E-05
                          165.85-9.119E-05 %(P 3.695E-02 1.09E-02 G

EU-152       1.0029E-02
                          121.78 1.003E-02 %(P 1.075E-01 3.21E-02 G K
                          344.30-7.612E-02 & P 1.391E-01 4.23E-02 G
                         1408.08-3.866E-03 % P 1.185E-01 3.11E-02 G
                          964.00-2.625E-02 % P 2.053E-01 5.88E-02 G
                         1112.07-6.530E-02 % P 2.691E-01 7.85E-02 G
                          778.90-6.957E-02 & P 2.827E-01 8.33E-02 G

EU-154      -3.1481E-04
                          123.10-3.148E-04 &(P 6.831E-02 2.02E-02 G K
                         1274.80-8.236E-03 % P 1.017E-01 2.88E-02 G
                          723.30-3.413E-04 % P 1.470E-01 4.17E-02 G
                         1004.80-1.848E-03 & P 1.859E-01 5.23E-02 G

EU-155       8.9298E-02
                           86.45 8.930E-02 %(  1.309E-01 4.00E-02 G K
                          105.31 1.713E-02 % P 1.552E-01 4.63E-02 G

HG-203       6.0449E-02
                          279.17-6.401E-03 %(P 3.406E-02 1.01E-02 G K
                           72.87 9.117E-01 &(P 1.032E+00 3.17E-01 G
                           70.83-9.237E-01 %   1.899E+00 5.76E-01 G
                           82.50-4.477E-01 %   2.200E+00 6.61E-01 G

TL-208       4.4753E-03
                          583.14 4.475E-03 %(P 3.181E-02 9.16E-03 G
                          510.72-9.167E-02 % P 1.332E-01 3.42E-02 G

PB-212       1.1615E-01
                          238.63-3.025E-02 %(P 1.117E-01 3.33E-02 G K
                                                          Energy duplication
                           77.11-3.220E-01 +   3.576E-01 1.10E-01 G
                           74.81 7.734E-01 *(P 6.142E-01 1.91E-01 G
```

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
PB-214	-2.5030E-02						
		351.99	-2.503E-02	%(P	7.749E-02	2.29E-02	G K
		295.22	-1.461E-01	& P	1.824E-01	5.59E-02	G
							Energy duplication
		77.11	-5.406E-01	+ P	5.856E-01	1.79E-01	G
		241.92	-1.628E-01	& P	4.060E-01	1.22E-01	G
BI-212	8.4995E-03						
		727.17	8.499E-03	&(P	2.355E-01	6.68E-02	G K
		1620.56	-1.169E-01	% P	7.607E-01	2.00E-01	G
		785.42	-2.251E-01	& P	1.591E+00	4.57E-01	G
BI-214	-1.1544E-02						
		609.32	-1.154E-02	&(P	6.433E-02	1.83E-02	G K
		1764.51	1.614E-02	& P	1.319E-01	3.43E-02	G
		1120.28	2.260E-02	& P	2.283E-01	6.50E-02	G
RA-224	-3.2546E-01						
		241.00	-3.255E-01	&(P	8.296E-01	2.50E-01	G
RA-226	-3.7724E-01						
		185.99	-3.772E-01	%(	1.003E+00	3.03E-01	G
AC-228	-1.4300E-02						
		911.07	-1.430E-02	&(P	1.024E-01	2.78E-02	G K
		968.90	-5.128E-03	& P	2.012E-01	5.64E-02	G
		338.40	-1.192E-01	% P	2.473E-01	7.44E-02	G
TH-227	2.4513E+00						
		236.00	2.451E+00	*(P	2.935E-01	1.18E-01	G K
		256.25	-3.924E-02	% P	4.049E-01	1.19E-01	G
PA-234	2.6022E-02						
		98.44	2.602E-02	%(	1.107E-01	3.31E-02	G K
		946.00	-5.103E-02	%	1.959E-01	5.79E-02	G
		131.28	-5.048E-02	&	1.640E-01	4.94E-02	G
		94.67	-1.055E-01	%	2.583E-01	7.81E-02	G
		883.24	7.801E-02	%	2.254E-01	6.70E-02	G
		926.70	7.863E-02	%	2.438E-01	7.21E-02	G
		569.26	-3.024E-03	%	2.934E-01	8.47E-02	G
TH-234	4.0488E-01						
		63.29	-2.064E-01	&(P	1.741E+00	5.15E-01	G K
		92.80	-2.069E-01	& P	1.385E+00	4.09E-01	G
		92.38	1.333E+00	(P	1.554E+00	4.77E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
AM-241	-2.4669E-02						
		59.54	-2.467E-02	&(P	2.322E-01	6.94E-02	G

(- This peak used in the nuclide activity average.

* - Peak is too wide, but only one peak in library.
! - Peak is part of a multiplet and this area went negative during deconvolution.
? - Peak is too narrow.
@ - Peak is too wide at FW25M, but ok at FWHM.
% - Peak fails sensitivity test.
$ - Peak identified, but first peak of this nuclide failed one or more qualification tests.
+ - Peak activity higher than counting uncertainty range.
- - Peak activity lower than counting uncertainty range.
= - Peak outside analysis energy range.
& - Calculated peak centroid is not close enough to the library energy centroid for positive identification.
P - Peakbackground subtraction
} - Peak is too close to another for the activity to be found directly.

Nuclide Codes:	Peak Codes:
T - Thermal Neutron Activation	G - Gamma Ray
F - Fast Neutron Activation	X - X-Ray
I - Fission Product	P - Positron Decay
N - Naturally Occurring Isotope	S - Single-Escape
P - Photon Reaction	D - Double-Escape
C - Charged Particle Reaction	K - Key Line
M - No MDA Calculation	A - Not in Average
R - Coincidence Corrected	C - Coincidence Peak
H - Halflife limit exceeded	

- -

***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	-4.8668E-02	-5.1344E-02	2.5229E-01	2.5231E-01	2.707E-01
K-40	#A	-5.0255E-02	-5.0255E-02	2.0356E+00	2.0357E+00	2.886E-01
MN-54	#A	-1.8955E-03	-1.9129E-03	3.2511E-02	3.2511E-02	2.698E-02
CO-57	#B	1.0331E-03	1.0440E-03	3.2716E-02	3.2716E-02	3.629E-02
CO-60	#B	2.7278E-03	2.7318E-03	2.3738E-02	2.3738E-02	2.919E-02
Sr-85	#A	-2.9022E-03	-3.0330E-03	2.1162E-02	2.1163E-02	2.328E-02
Kr-85	#A	-1.0392E+02	-1.0392E+02	9.6395E+02	9.6397E+02	5.469E+02
Y-88	#F	8.6691E-02	8.9048E-02	2.3518E-02	2.4099E-02	1.006E-02
NB-94	#B	1.6052E-03	1.6052E-03	2.6706E-02	2.6706E-02	3.122E-02
Ag-108M	#B	-2.5022E-04	-2.5023E-04	2.3846E-02	2.3846E-02	2.817E-02
CD-109	#A	7.7401E-01	7.7890E-01	9.4478E-01	9.4577E-01	1.021E+00

SN-113	#B	-5.7214E-04	-5.8653E-04	1.1151E-01	1.1151E-01	4.333E-02
SB-125	#F	2.8572E-01	2.8652E-01	7.5676E-02	7.7545E-02	8.585E-02
I-131	#B	3.5259E-03	5.0313E-03	3.9653E-02	3.9654E-02	3.153E-02
CS-134	#A	-4.2474E-02	-4.2635E-02	4.6222E-02	4.6290E-02	4.866E-02
CS-137	#A	-2.9289E-03	-2.9297E-03	5.3835E-01	5.3835E-01	3.420E-02
CE-139	#A	-8.9311E-05	-9.1187E-05	3.8022E-01	3.8022E-01	3.619E-02
EU-152	#B	1.0022E-02	1.0029E-02	9.6159E-02	9.6161E-02	1.074E-01
EU-154	#B	-3.1452E-04	-3.1481E-04	2.9623E+00	2.9623E+00	6.825E-02
EU-155	#B	8.9158E-02	8.9298E-02	1.1998E-01	1.2008E-01	1.307E-01
HG-203	#F	5.6851E-02	6.0449E-02	6.2982E-02	6.3083E-02	3.203E-02
TL-208	#A	4.4753E-03	4.4753E-03	2.7482E-02	2.7483E-02	3.181E-02
PB-212	#F	1.1615E-01	1.1615E-01	8.5829E-02	8.6103E-02	1.117E-01
PB-214	#B	-2.5030E-02	-2.5030E-02	1.0538E-01	1.0539E-01	7.749E-02
BI-212	#B	8.4995E-03	8.4995E-03	2.0034E-01	2.0034E-01	2.355E-01
BI-214	#B	-1.1544E-02	-1.1544E-02	1.5673E-01	1.5673E-01	6.433E-02
RA-224	#A	-3.2546E-01	-3.2546E-01	8.3087E-01	8.3109E-01	8.296E-01
RA-226	#A	-3.7723E-01	-3.7724E-01	9.0854E-01	9.0881E-01	1.003E+00
AC-228	#B	-1.4300E-02	-1.4300E-02	8.3815E-01	8.3815E-01	1.024E-01
TH-227	#	2.4513E+00	2.4513E+00	3.5377E-01	3.8225E-01	2.935E-01
PA-234	#B	2.6022E-02	2.6022E-02	9.9401E-02	9.9412E-02	1.107E-01
TH-234	#B	4.0488E-01	4.0488E-01	4.3470E-01	4.3528E-01	1.741E+00
AM-241	#A	-2.4669E-02	-2.4669E-02	2.2614E-01	2.2615E-01	2.322E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (50.2 to 2000.1 keV) 0.0000000E+00 pCi/gm
Total Decayed Activity (50.2 to 2000.1 keV) 0.0000000E+00 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JPK

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

Sample description
OOL-05-03-001-MTP

Spectrum Filename: C:\GammaVision\Spectra\107_31AUG2006_1725.An1

Acquisition information

Start time:	31-Aug-2006 17:25:44
Live time:	2000
Real time:	2002
Dead time:	0.10 %
Detector ID:	2

Detector system
Det 107- DSPE- 634

Calibration

Filename:	D7_1LSa.Clb

Detector 107 Calibration for 1 Liter Sand Marinelli

Energy Calibration

Created:	29-Oct-2004 06:48:53
Zero offset:	0.157 keV
Gain:	0.500 keV/channel
Quadratic:	-1.676E-08 keV/channel^2

Efficiency Calibration

Created:	29-Oct-2004 06:51:32
Type:	Polynomial
Uncertainty:	1.174 %
Coefficients:	-0.279532 -4.778179 0.614896
	-0.087174 0.005356 -0.000131

Library Files

Main analysis library:	FSS_Rev_1.Lib
Library Match Width:	1.000
Peak stripping:	Library based

Analysis parameters

Analysis engine:	Env32 G53W4.20
Start channel:	100 (50.16keV)
Stop channel:	4000 (2000.15keV)
Peak rejection level:	41.667%
Peak search sensitivity:	3
Sample Size:	1.7590E+03
Activity scaling factor:	1.0000E+06/(1.0000E+00* 1.7590E+03) = 5.6850E+02
Detection limit method:	Nureg 4.16
Random error:	1.0000000E+00
Systematic error:	1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	29-Aug-2006 10:45:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	107_150K_28APR05.Pbc 01-May-2005 05:30:33
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 18 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.0841

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
74.74	293.	15.20	1.18	2.854E-02	74.81	9.600	8.128E-01	PB212
77.13	471.	9.11	1.18	2.965E-02	77.11	10.700	1.133E+00	PB214
					77.11	17.500	6.996E-01	PB212
84.46	80.	40.41	0.95	3.226E-02				
93.10	120.	34.75	1.50	3.438E-02	88.04	3.790	PBC<MDA	CD109
					92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
186.15	185.	18.11	1.87	3.609E-02	185.99	3.280	1.200E+00	RA226
208.99	154.	26.88	1.04	3.431E-02				
238.75	1108.	3.92	1.30	3.189E-02	238.63	43.100	6.106E-01	PB212
					241.00	3.900	6.873E+00	RA224
241.83	194.	16.74	1.30	3.164E-02	241.92	7.470	6.269E-01	PB214
270.24	119.	21.28	2.27	2.944E-02				
295.29	221.	10.63	1.34	2.769E-02	295.22	19.200	3.127E-01	PB214
300.55	67.	28.91	1.34	2.734E-02				
328.11	77.	31.20	1.50	2.560E-02				
338.50	242.	9.77	1.56	2.500E-02	338.40	12.010	6.109E-01	AC228
351.98	550.	7.50	1.43	2.426E-02	351.99	37.100	4.648E-01	PB214
463.22	58.	30.94	1.50	1.953E-02	463.51	10.000	PBC<MDA	SB125
510.75	188.	18.60	1.95	1.808E-02	510.72	22.500	2.917E-01	TL208
583.15	403.	7.44	1.43	1.629E-02	583.14	86.000	2.186E-01	TL208
609.41	358.	6.48	1.63	1.574E-02	604.66	97.600	1.783E-01	CS134
					609.32	46.090	3.749E-01	BI214
727.34	132.	16.67	2.01	1.374E-02	727.17	11.800	6.183E-01	BI212
785.14	68.	25.68	1.78	1.297E-02	785.42	2.000	2.007E+00	BI212
794.92	73.	23.99	1.23	1.285E-02				
794.92	73.	23.99	1.23	1.285E-02	795.76	85.400	5.117E-02	CS134

911.28	276.	7.03	1.87	1.161E-02	911.07	29.000	6.193E-01	AC228
964.24	43.	35.47	1.80	1.113E-02	964.00	14.580	PBC<MDA	EU152
969.04	179.	9.28	1.80	1.109E-02	968.90	17.460	7.004E-01	AC228
1120.40	105.	17.82	1.30	9.969E-03	1120.28	15.040	5.334E-01	BI214
1460.82	1356.	2.84	2.46	8.191E-03	1460.75	10.700	1.185E+01	K40

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
1621.08	12.	38.12	2.21	7.569E-03	1620.56	2.750	PBC<MDA	BI212
1764.99	72.	11.70	0.94	7.084E-03	1764.51	15.920	4.912E-01	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
417.63	208.99	542.	154.	0.077	80.64	1.035	AC-228	s
540.10	270.24	226.	119.	0.059	63.84	2.273	AC-228	s
600.02	300.20	188.	67.	0.033	96.38	1.491	PB-212	M
655.84	328.11	207.	77.	0.038	93.59	1.504	AC-228	s

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.
M - Peak is close to a library peak.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-212	149.29	74.81	660.	292.	0.146	40.72	1.178D
PB-212	153.89	77.11	685.	429.	0.214	22.71	1.179A
TH-234	185.86	93.10	1132.	120.	0.060	104.26	1.500
RA-226	371.95	186.15	426.	185.	0.093	54.32	1.869s
TH-227	471.07	235.72	1067.	-121.	-0.061	117.62	1.500s
PB-212	476.89	238.63	347.	1093.	0.546	11.39	1.297D
RA-224	477.17	238.77	597.	1058.	0.529	13.42	1.500
PB-214	483.47	241.92	442.	184.	0.092	52.77	1.299D
PB-214	589.67	295.02	431.	331.	0.166	38.66	1.446s
AC-228	676.61	338.50	147.	239.	0.119	29.30	1.562s
PB-214	703.58	351.98	308.	544.	0.272	22.50	1.429s
SB-125	926.03	463.22	151.	58.	0.029	92.81	1.500s
TL-208	1021.09	510.75	275.	154.	0.077	55.80	1.953s
TL-208	1165.88	583.15	142.	399.	0.199	22.31	1.432
BI-214	1218.39	609.41	80.	354.	0.177	19.45	1.635
BI-212	1454.24	727.34	104.	131.	0.065	50.01	2.014s
BI-212	1569.85	785.14	71.	68.	0.034	77.04	1.778
CS-134	1589.73	795.08	62.	44.	0.022	87.63	1.684s
AC-228	1822.12	911.28	43.	271.	0.136	21.09	1.867
EU-152	1928.05	964.24	94.	43.	0.021	106.41	1.796
AC-228	1937.36	968.90	58.	176.	0.088	28.61	1.799D
BI-214	2240.36	1120.40	71.	104.	0.052	53.45	1.296s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
K-40	2921.23	1460.82	29.	1352.	0.676	8.51	2.456
BI-212	3241.78	1621.08	6.	12.	0.006	114.37	2.206s
BI-214	3529.63	1764.99	1.	72.	0.036	35.11	0.938s

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	Peak MDA Value pCi/gm	COMMENTS
BE-7		4.1178E-02					
			477.56	4.118E-02	&(	2.297E-01 6.76E-02	G
K-40		1.1848E+01					
			1460.75	1.185E+01	(P	2.450E-01 3.37E-01	G
MN-54		6.3029E-03					
			834.81	6.303E-03	%(P	3.011E-02 8.84E-03	G
CO-57		-1.1889E-02					
			122.07	-1.189E-02	%(P	3.353E-02 1.01E-02	G K
			136.43	-6.522E-02	% P	2.420E-01 7.27E-02	G
CO-60		1.8916E-04					
			1332.51	1.892E-04	%(P	2.974E-02 8.14E-03	G K
			1173.23	1.423E-02	& P	3.623E-02 1.07E-02	G K
Sr-85		-2.1011E-02					
			514.00	-2.101E-02	&(	3.546E-02 1.08E-02	G
Kr-85		-5.0310E+02					
			513.99	-5.031E+02	&(P	8.031E+02 2.44E+02	G
Y-88		-1.5318E-03					
			1836.01	-1.532E-03	&(P	2.654E-02 7.01E-03	G K
			898.02	2.413E-03	% P	2.949E-02 8.42E-03	G
NB-94		-8.7071E-05					
			871.10	-8.707E-05	&(P	2.511E-02 7.08E-03	G K
			702.50	4.364E-03	% P	2.748E-02 8.03E-03	G K
Ag-108M		-1.4027E-02					
			722.95	-1.403E-02	%(	3.898E-02 1.17E-02	G K
			614.37	-2.117E-02	&	3.498E-02 1.07E-02	G
			433.93	-1.040E-03	& P	2.444E-02 7.04E-03	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CD-109	1.7572E-01						
		88.04	1.757E-01	%(P	8.488E-01	2.55E-01	G
SN-113	7.5868E-03						
		391.71	7.587E-03	&(P	3.372E-02	9.97E-03	G K
		255.04	2.853E-01	&	9.989E-01	2.99E-01	G
SB-125	5.6686E-02						
		427.95	-1.753E-03	&(P	7.927E-02	2.29E-02	G K
		600.77	3.062E-02	% P	1.299E-01	3.82E-02	G
		636.15	-4.981E-02	& P	2.367E-01	6.95E-02	G
		463.51	2.297E-01	*(P	2.362E-01	7.45E-02	G
		176.29	-1.522E-02	% P	3.688E-01	1.09E-01	G
I-131	2.3012E-03						
		364.48	2.301E-03	%(	3.114E-02	9.11E-03	G K
		636.97	2.571E-04	&	4.141E-01	1.19E-01	G
		284.29	-1.107E-01	&	4.524E-01	1.35E-01	G
CS-134	7.8266E-03						
		604.66	-1.225E-02	%(P	4.184E-02	1.25E-02	G K
		795.76	3.077E-02	*(P	2.772E-02	9.10E-03	G
		569.29	4.914E-02	%	1.417E-01	4.23E-02	G
		801.84	-5.776E-02	% P	2.918E-01	8.50E-02	G
CS-137	1.4927E-02						
		661.62	1.493E-02	%(P	3.237E-02	9.73E-03	G
CE-139	7.2312E-03						
		165.85	7.231E-03	%(P	3.206E-02	9.61E-03	G
EU-152	4.5101E-02						
		121.78	-3.301E-02	%(P	1.001E-01	3.02E-02	G K
		344.30	1.716E-04	% P	7.881E-02	2.30E-02	G
		1408.08	-3.051E-03	% P	1.221E-01	3.31E-02	G
		964.00	2.018E-01	&(P	2.264E-01	7.18E-02	G
		1112.07	5.860E-02	& P	2.553E-01	7.50E-02	G
		778.90	-3.368E-02	% P	1.935E-01	5.61E-02	G
EU-154	-2.5981E-02						
		123.10	-2.598E-02	%(P	6.647E-02	2.01E-02	G K
		1274.80	-1.586E-02	& P	9.567E-02	2.77E-02	G
		723.30	-6.850E-02	% P	1.800E-01	5.40E-02	G
		1004.80	-2.481E-02	% P	1.375E-01	3.95E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
EU-155	7.0735E-02						
		86.45	7.074E-02	&(	1.204E-01	3.67E-02	G K
		105.31	2.831E-02	& P	1.415E-01	4.25E-02	G
HG-203	2.4287E-03						
		279.17	2.429E-03	&(P	3.056E-02	9.03E-03	G K
		72.87	-5.979E-01	% P	9.614E-01	2.93E-01	G
		70.83	6.414E-02	%	1.423E+00	4.25E-01	G
		82.50	-6.938E-01	%	1.855E+00	5.61E-01	G
TL-208	2.1862E-01						
		583.14	2.186E-01	(P	3.197E-02	1.64E-02	G
		510.72	2.917E-01	+ P	1.509E-01	6.61E-02	G
PB-212	6.3647E-01						
		238.63	6.107E-01	(P	5.005E-02	2.35E-02	G K
							Energy duplication
		77.11	6.365E-01	}	1.851E-01	4.82E-02	G
		74.81	8.190E-01	+ P	3.439E-01	1.13E-01	G
PB-214	4.6952E-01						
		351.99	4.648E-01	@(P	7.207E-02	3.52E-02	G K
		295.22	4.787E-01	*(P	1.438E-01	6.25E-02	G
							Energy duplication
		77.11	6.381E-02	} P	3.919E-01	1.10E-01	G
		241.92	5.989E-01	+ P	3.273E-01	1.06E-01	G
BI-212	6.1830E-01						
		727.17	6.183E-01	@(P	2.385E-01	1.04E-01	G K
		1620.56	4.475E-01	- P	5.133E-01	1.78E-01	G
		785.42	2.007E+00	+ P	1.246E+00	5.25E-01	G
BI-214	3.7491E-01						
		609.32	3.749E-01	(P	4.698E-02	2.46E-02	G K
		1764.51	4.912E-01	+ P	5.021E-02	5.82E-02	G
		1120.28	5.334E-01	+ P	2.149E-01	9.59E-02	G
RA-224	6.5765E+00						
		241.00	6.577E+00	?(P	7.245E-01	2.95E-01	G
RA-226	1.2003E+00						
		185.99	1.200E+00	(	6.416E-01	2.17E-01	G
AC-228	6.4137E-01						
		911.07	6.193E-01	(P	7.562E-02	4.42E-02	G K
		968.90	6.990E-01	(P	1.513E-01	6.75E-02	G
		338.40	6.109E-01	(P	1.516E-01	6.05E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TH-227	-2.5936E-01						
		236.00	-2.594E-01	?(P	3.310E-01	1.01E-01	G K
		256.25	-9.610E-03	& P	3.628E-01	1.07E-01	G
PA-234	3.8185E-02						
		98.44	3.819E-02	%(	1.226E-01	3.69E-02	G K
		946.00	1.674E-02	&	1.645E-01	4.77E-02	G
		131.28	2.436E-02	%	1.439E-01	4.31E-02	G
		94.67	-8.930E-02	%	2.347E-01	7.10E-02	G
		883.24	8.020E-02	&	1.857E-01	5.59E-02	G
		926.70	-3.620E-02	&	2.650E-01	7.69E-02	G
		569.26	7.174E-02	%	2.101E-01	6.27E-02	G
TH-234	6.0929E-01						
		63.29	3.896E-01	%(P	1.500E+00	4.50E-01	G K
		92.80	8.949E-01	(P	1.188E+00	3.62E-01	G
		92.38	-6.950E-02	% P	1.443E+00	4.29E-01	G
AM-241	-1.7709E-02						
		59.54	-1.771E-02	%(P	1.919E-01	5.73E-02	G

(- This peak used in the nuclide activity average.

* - Peak is too wide, but only one peak in library.
! - Peak is part of a multiplet and this area went negative during deconvolution.
? - Peak is too narrow.
@ - Peak is too wide at FW25M, but ok at FWHM.
% - Peak fails sensitivity test.
$ - Peak identified, but first peak of this nuclide failed one or more qualification tests.
\+ - Peak activity higher than counting uncertainty range.
\- - Peak activity lower than counting uncertainty range.
= - Peak outside analysis energy range.
& - Calculated peak centroid is not close enough to the library energy centroid for positive identification.
P - Peakbackground subtraction
} - Peak is too close to another for the activity to be found directly.

Nuclide Codes:	Peak Codes:
T - Thermal Neutron Activation	G - Gamma Ray
F - Fast Neutron Activation	X - X-Ray
I - Fission Product	P - Positron Decay
N - Naturally Occurring Isotope	S - Single-Escape
P - Photon Reaction	D - Double-Escape
C - Charged Particle Reaction	K - Key Line
M - No MDA Calculation	A - Not in Average

R - Coincidence Corrected C - Coincidence Peak
H - Halflife limit exceeded

- -

***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	3.9978E-02	4.1178E-02	2.0294E-01	2.0296E-01	2.231E-01
K-40		1.1848E+01	1.1848E+01	1.0123E+00	1.2306E+00	
MN-54	#A	6.2711E-03	6.3029E-03	2.6522E-02	2.6524E-02	2.996E-02
CO-57	#B	-1.1820E-02	-1.1889E-02	3.0691E-02	3.0698E-02	3.333E-02
CO-60	#B	1.8901E-04	1.8916E-04	2.4414E-02	2.4414E-02	2.971E-02
Sr-85	#A	-2.0505E-02	-2.1011E-02	3.2508E-02	3.2531E-02	3.461E-02
Kr-85	#A	-5.0309E+02	-5.0310E+02	8.2436E+02	8.2489E+02	8.031E+02
Y-88	#B	-1.5093E-03	-1.5318E-03	8.6048E-02	8.6049E-02	2.615E-02
NB-94	#B	-8.7071E-05	-8.7071E-05	5.7815E-03	5.7815E-03	2.511E-02
Ag-108M	#B	-1.4026E-02	-1.4027E-02	3.5091E-02	3.5101E-02	3.897E-02
CD-109	#A	1.7511E-01	1.7572E-01	7.6400E-01	7.6406E-01	8.459E-01
SN-113	#B	7.4834E-03	7.5868E-03	2.9901E-02	2.9904E-02	3.326E-02
SB-125	#B	5.6598E-02	5.6686E-02	5.5147E-02	5.5249E-02	7.915E-02
I-131	#B	1.8908E-03	2.3012E-03	2.7338E-02	2.7338E-02	2.559E-02
CS-134	#B	7.8102E-03	7.8266E-03	6.9415E-03	6.9569E-03	4.175E-02
CS-137	#A	1.4925E-02	1.4927E-02	2.9185E-02	2.9198E-02	3.236E-02
CE-139	#A	7.1486E-03	7.2312E-03	2.8835E-02	2.8839E-02	3.169E-02
EU-152	#B	4.5085E-02	4.5101E-02	4.8136E-02	4.8201E-02	1.001E-01
EU-154	#B	-2.5968E-02	-2.5981E-02	6.1499E-02	6.1516E-02	6.644E-02
EU-155	#B	7.0674E-02	7.0735E-02	1.0998E-01	1.1005E-01	1.203E-01
HG-203	#B	2.3478E-03	2.4287E-03	2.7096E-02	2.7096E-02	2.954E-02
TL-208		2.1862E-01	2.1862E-01	4.9335E-02	5.0996E-02	
PB-212		6.3647E-01	6.3647E-01	7.3550E-02	8.2599E-02	
PB-214		4.6952E-01	4.6952E-01	1.0634E-01	1.0989E-01	
BI-212		6.1830E-01	6.1830E-01	3.1225E-01	3.1437E-01	
BI-214		3.7491E-01	3.7491E-01	7.3806E-02	7.7056E-02	
RA-224	#	6.5765E+00	6.5765E+00	8.8434E-01	9.6587E-01	7.245E-01
RA-226		1.2003E+00	1.2003E+00	6.5202E-01	6.5586E-01	
AC-228		6.4137E-01	6.4137E-01	9.9824E-02	1.0677E-01	
TH-227	#A	-2.5936E-01	-2.5936E-01	3.0574E-01	3.0612E-01	3.310E-01
PA-234	#B	3.8185E-02	3.8185E-02	1.1083E-01	1.1085E-01	1.226E-01
TH-234	#B	6.0929E-01	6.0929E-01	7.3954E-01	7.4032E-01	1.500E+00
AM-241	#A	-1.7709E-02	-1.7709E-02	1.8915E-01	1.8916E-01	1.919E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.

H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (1120.2 to 2000.1 keV) 1.6007706E+01 pCi/gm
Total Decayed Activity (1120.2 to 2000.1 keV) 1.6007708E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JJM

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 107_31AUG2006_1801.An1

Sample description
OOL-05-03-003-MTP

Spectrum Filename: C:\GammaVision\Spectra\107_31AUG2006_1801.An1

Acquisition information
Start time: 31-Aug-2006 18:01:24
Live time: 2000
Real time: 2002
Dead time: 0.09 %
Detector ID: 2

Detector system
Det 107- DSPE- 634

Calibration
Filename: D7_1LSa.Clb
Detector 107 Calibration for 1 Liter Sand Marinelli

Energy Calibration
Created: 29-Oct-2004 06:48:53
Zero offset: 0.157 keV
Gain: 0.500 keV/channel
Quadratic: -1.676E-08 keV/channel^2

Efficiency Calibration
Created: 29-Oct-2004 06:51:32
Type: Polynomial
Uncertainty: 1.174 %
Coefficients: -0.279532 -4.778179 0.614896
-0.087174 0.005356 -0.000131

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.16keV)
Stop channel: 4000 (2000.15keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 1.3450E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.3450E+03) =
7.4349E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	29-Aug-2006 11:05:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	107_150K_28APR05.Pbc 01-May-2005 05:30:33
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 19 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.1481

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
69.52	106.	41.65	1.50	2.625E-02	70.83	3.520	PBC<MDA	HG203
74.58	261.	14.77	1.18	2.842E-02	74.81	9.600	9.452E-01	PB212
77.15	454.	8.99	1.18	2.963E-02	77.11	10.700	1.425E+00	PB214
					77.11	17.500	8.806E-01	PB212
87.23	134.	35.50	1.50	3.284E-02	86.45	32.740	PBC<MDA	EU155
					88.04	3.790	PBC<MDA	CD109
92.95	168.	26.53	1.50	3.429E-02	92.38	2.570	1.917E+00	TH234
					92.80	3.000	PBC<MDA	TH234
92.97	158.	25.81	1.50	3.438E-02	92.38	2.570	1.803E+00	TH234
					92.80	3.000	1.541E+00	TH234
128.72	101.	36.98	1.63	3.817E-02				
185.97	184.	21.99	1.16	3.610E-02	185.99	3.280	1.562E+00	RA226
209.35	125.	25.66	1.75	3.428E-02				
238.75	1002.	4.01	1.30	3.188E-02	238.63	43.100	7.211E-01	PB212
241.60	188.	20.14	1.30	3.165E-02	241.00	3.900	1.511E+00	RA224
					241.92	7.470	7.940E-01	PB214
270.61	116.	27.33	1.00	2.942E-02				
295.32	244.	9.50	1.34	2.767E-02	295.22	19.200	4.524E-01	PB214
300.18	82.	24.35	1.34	2.734E-02				
327.67	90.	34.41	1.88	2.562E-02				
338.29	295.	11.83	1.42	2.501E-02	338.40	12.010	9.756E-01	AC228
351.92	447.	9.34	1.59	2.426E-02	351.99	37.100	4.933E-01	PB214
462.79	56.	32.25	1.50	1.953E-02	463.51	10.000	PBC<MDA	SB125
511.27	207.	13.62	1.81	1.807E-02	510.72	22.500	4.286E-01	TL208
583.31	346.	6.58	1.77	1.629E-02	583.14	86.000	2.446E-01	TL208
609.28	378.	8.69	2.06	1.574E-02	609.32	46.090	5.169E-01	BI214
662.25	61.	29.00	1.27	1.476E-02	661.62	84.620	4.620E-02	CS137

727.60	87.	22.08	0.85	1.374E-02	727.17	11.800	5.310E-01	BI212
768.09	48.	40.33	1.50	1.319E-02				
794.99	30.	37.86	1.68	1.284E-02	795.76	85.400	PBC<MDA	CS134
911.26	306.	7.88	2.10	1.161E-02	911.07	29.000	9.013E-01	AC228
968.04	216.	10.32	2.65	1.110E-02	968.90	17.460	1.111E+00	AC228

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
1120.50	103.	27.16	2.29	9.970E-03	1120.28	15.040	6.882E-01	BI214
1460.86	1360.	2.75	2.41	8.190E-03	1460.75	10.700	1.554E+01	K40
1764.52	65.	12.31	2.44	7.084E-03	1764.51	15.920	5.800E-01	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
418.33	209.35	375.	125.	0.062	76.97	1.753	AC-228	s
540.85	270.61	308.	116.	0.058	82.00	1.000	AC-228	
599.99	300.19	188.	77.	0.038	86.79	1.790	PB-212	sM
654.96	327.67	262.	90.	0.045	103.24	1.876	AC-228	s
1535.74	768.09	101.	48.	0.024	120.99	1.502	BI-214	sM

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.
M - Peak is close to a library peak.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
HG-203	138.72	69.52	922.	106.	0.053	124.94	1.500
PB-212	149.29	74.81	602.	273.	0.136	41.61	1.178D
PB-212	153.89	77.11	602.	372.	0.186	25.64	1.179A
EU-155	174.13	87.23	1067.	134.	0.067	106.50	1.500
TH-234	185.57	92.95	1012.	168.	0.084	79.60	1.500
TH-234	185.60	92.97	985.	158.	0.079	77.43	1.500
RA-226	371.58	185.97	539.	184.	0.092	65.97	1.158s
TH-227	471.58	235.97	952.	-115.	-0.057	117.61	1.500s
PB-212	476.89	238.63	271.	987.	0.493	11.64	1.297D
RA-224	482.95	241.66	792.	99.	0.049	121.72	1.500
PB-214	483.47	241.92	374.	166.	0.083	54.16	1.299D
PB-214	590.87	295.62	317.	331.	0.165	32.34	1.575s
AC-228	676.20	338.29	274.	292.	0.146	35.50	1.417s
PB-214	703.45	351.92	329.	442.	0.221	28.02	1.594s
SB-125	925.17	462.79	152.	56.	0.028	96.76	1.500s
TL-208	1022.14	511.27	197.	174.	0.087	40.87	1.812s
TL-208	1166.20	583.31	76.	341.	0.171	19.74	1.774
BI-214	1218.15	609.28	171.	373.	0.187	26.07	2.057s
Ag-108M	1223.71	612.07	202.	-56.	-0.028	114.56	1.561s
CS-137	1324.07	662.25	88.	57.	0.029	87.01	1.272s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
BI-212	1454.76	727.60	95.	86.	0.043	66.24	0.846s
CS-134	1589.56	794.99	52.	30.	0.015	113.58	1.684s
AC-228	1822.08	911.26	77.	302.	0.151	23.65	2.103
AC-228	1935.65	968.04	75.	214.	0.107	30.96	2.651s
BI-214	2240.57	1120.50	141.	103.	0.051	81.47	2.291s
K-40	2921.32	1460.86	14.	1355.	0.678	8.24	2.409
BI-214	3528.70	1764.52	1.	65.	0.033	36.93	2.437

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	Peak MDA Value pCi/gm	COMMENTS
BE-7		1.4574E-01					
			477.56	1.457E-01	%(	2.918E-01 8.87E-02	G
K-40		1.5537E+01					
			1460.75	1.554E+01	(P	2.290E-01 4.28E-01	G
MN-54		-5.2912E-03					
			834.81	-5.291E-03	&(P	2.931E-02 8.43E-03	G
CO-57		3.0192E-03					
			122.07	3.019E-03	&(P	4.066E-02 1.21E-02	G K
			136.43	-1.519E-03	% P	2.763E-01 8.18E-02	G
CO-60		3.4520E-04					
			1332.51	3.452E-04	%(P	3.491E-02 9.41E-03	G K
			1173.23	4.920E-03	& P	4.244E-02 1.20E-02	G K
Sr-85		-1.9750E-02					
			514.00	-1.975E-02	%(	4.399E-02 1.33E-02	G
Kr-85		-4.8405E+02					
			513.99	-4.841E+02	%(P	9.968E+02 3.00E+02	G
Y-88		-1.2162E-03					
			1836.01	-1.216E-03	%(P	2.607E-02 6.40E-03	G K
			898.02	-2.289E-03	& P	3.332E-02 9.25E-03	G
NB-94		-3.9344E-03					
			871.10	-3.934E-03	&(P	3.165E-02 9.08E-03	G K
			702.50	-5.396E-04	& P	3.307E-02 9.43E-03	G K

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
Ag-108M	0.0000E+00						
		722.95	0.000E+00	&(	7.148E-02	2.10E-02	G K
		614.37	-3.996E-02	+	4.904E-02	1.53E-02	G
		433.93	9.572E-03	& P	2.671E-02	7.96E-03	G
CD-109	-9.6198E-02						
		88.04	-9.620E-02	%(P	1.354E+00	4.05E-01	G
SN-113	3.0110E-04						
		391.71	3.011E-04	&(P	4.621E-02	1.34E-02	G K
		255.04	-2.441E-01	%	1.473E+00	4.38E-01	G
SB-125	5.8801E-02						
		427.95	-1.840E-02	%(P	9.030E-02	2.64E-02	G K
		600.77	5.186E-02	& P	1.305E-01	3.89E-02	G
		636.15	-3.528E-03	% P	2.601E-01	7.38E-02	G
		463.51	2.873E-01	*(P	3.100E-01	9.73E-02	G
		176.29	-5.434E-02	& P	4.968E-01	1.48E-01	G
I-131	1.5280E-02						
		364.48	1.528E-02	%(	3.466E-02	1.05E-02	G K
		636.97	6.835E-02	%	4.795E-01	1.39E-01	G
		284.29	1.069E-01	%	5.379E-01	1.60E-01	G
CS-134	1.1147E-02						
		604.66	-3.216E-03	&(P	8.021E-02	2.38E-02	G K
		795.76	2.756E-02	(P	3.338E-02	1.06E-02	G
		569.29	2.243E-02	&	1.917E-01	5.57E-02	G
		801.84	-6.254E-02	% P	3.864E-01	1.12E-01	G
CS-137	4.6200E-02						
		661.62	4.620E-02	(P	3.723E-02	1.42E-02	G
CE-139	-9.1981E-05						
		165.85	-9.198E-05	&(P	4.176E-02	1.24E-02	G
EU-152	9.0082E-03						
		121.78	9.008E-03	&(P	1.178E-01	3.51E-02	G K
		344.30	-2.543E-02	% P	1.108E-01	3.29E-02	G
		1408.08	5.128E-02	% P	1.231E-01	3.66E-02	G
		964.00	1.681E-01	& P	3.882E-01	1.17E-01	G
		1112.07	-3.202E-02	% P	3.306E-01	9.51E-02	G
		778.90	-1.786E-02	% P	2.611E-01	7.47E-02	G
EU-154	5.8244E-03						
		123.10	5.824E-03	&(P	7.825E-02	2.33E-02	G K
		1274.80	-2.762E-02	% P	1.213E-01	3.53E-02	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          723.30-1.894E-02 & P 1.932E-01 5.61E-02 G
                         1004.80-2.510E-02 % P 2.043E-01 5.87E-02 G

EU-155       1.2545E-01
                           86.45 1.254E-01  (  1.449E-01 4.45E-02 G K
                          105.31 6.101E-02 % P 1.673E-01 5.05E-02 G

HG-203       4.8391E-02
                          279.17-1.045E-03 %(P 3.663E-02 1.07E-02 G K
                           72.87-2.847E-01 % P 1.190E+00 3.58E-01 G
                           70.83 1.193E+00 &(  1.623E+00 4.97E-01 G
                           82.50-5.352E-01 %   2.341E+00 7.04E-01 G

TL-208       2.4460E-01
                          583.14 2.446E-01  (P 3.107E-02 1.63E-02 G
                          510.72 4.286E-01 + P 1.684E-01 6.97E-02 G

PB-212       7.2124E-01
                          238.63 7.212E-01  (P 5.807E-02 2.84E-02 G K
                                                          Energy duplication
                           77.11 7.212E-01 }   2.272E-01 6.17E-02 G
                           74.81 1.002E+00 + P 4.299E-01 1.41E-01 G

PB-214       5.3824E-01
                          351.99 4.933E-01 @(P 9.740E-02 4.66E-02 G K
                          295.22 6.250E-01 *(P 1.621E-01 6.83E-02 G
                                                          Energy duplication
                           77.11 1.914E-01 } P 4.912E-01 1.38E-01 G
                          241.92 7.054E-01 + P 3.948E-01 1.28E-01 G

BI-212       5.3105E-01
                          727.17 5.310E-01  (P 2.986E-01 1.19E-01 G K
                         1620.56 3.174E-01 % P 1.003E+00 2.90E-01 G
                          785.42-4.393E-02 % P 1.361E+00 3.77E-01 G

BI-214       5.3311E-01
                          609.32 5.169E-01 *(P 8.807E-02 4.54E-02 G K
                         1764.51 5.800E-01  (P 6.566E-02 7.24E-02 G
                         1120.28 6.882E-01 + P 3.893E-01 1.89E-01 G

RA-224       8.0283E-01
                          241.00 8.028E-01 ?(P 1.088E+00 3.33E-01 G

RA-226       1.5621E+00
                          185.99 1.562E+00 *(  9.409E-01 3.44E-01 G

AC-228       9.7931E-01
                          911.07 9.013E-01  (P 1.302E-01 7.21E-02 G K
                          968.90 1.111E+00  (P 2.231E-01 1.16E-01 G
                          338.40 9.756E-01 *(P 2.674E-01 1.17E-01 G
```

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 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments

TH-227      -3.2100E-01
                          236.00-3.210E-01 ?(P 4.094E-01 1.26E-01 G K
                          256.25-5.080E-02 % P 4.092E-01 1.21E-01 G

PA-234       4.0903E-02
                           98.44 4.090E-02 %(  1.503E-01 4.52E-02 G K
                          946.00 8.038E-03 &   1.947E-01 5.58E-02 G
                          131.28-1.085E-02 &   1.723E-01 5.13E-02 G
                           94.67-9.047E-02 &   2.880E-01 8.69E-02 G
                          883.24 7.097E-02 &   2.625E-01 7.72E-02 G
                          926.70-9.039E-02 &   3.158E-01 9.32E-02 G
                          569.26 3.314E-02 &   2.727E-01 7.92E-02 G

TH-234       1.1808E+00
                           63.29 4.189E-01 %(P 1.895E+00 5.67E-01 G K
                           92.80 1.541E+00  (P 1.451E+00 4.47E-01 G
                           92.38 1.917E+00  (P 1.721E+00 5.33E-01 G

AM-241       4.1813E-04
                           59.54 4.181E-04 &(P 1.825E-01 5.40E-02 G
   ( - This peak used in the nuclide activity average.

   * - Peak is too wide, but only one peak in library.
   ! - Peak is part of a multiplet and this area went
       negative during deconvolution.
   ? - Peak is too narrow.
   @ - Peak is too wide at FW25M, but ok at FWHM.
   % - Peak fails sensitivity test.
   $ - Peak identified, but first peak of this nuclide
       failed one or more qualification tests.
   + - Peak activity higher than counting uncertainty range.
   - - Peak activity lower than counting uncertainty range.
   = - Peak outside analysis energy range.
   & - Calculated peak centroid is not close enough to the
       library energy centroid for positive identification.
   P - Peakbackground subtraction
   } - Peak is too close to another for the activity
       to be found directly.

   Nuclide Codes:                      Peak Codes:
   T - Thermal Neutron Activation      G - Gamma Ray
   F - Fast Neutron Activation         X - X-Ray
   I - Fission Product                 P - Positron Decay
   N - Naturally Occurring Isotope     S - Single-Escape
   P - Photon Reaction                 D - Double-Escape
   C - Charged Particle Reaction       K - Key Line
   M - No MDA Calculation              A - Not in Average
```

R - Coincidence Corrected C - Coincidence Peak
H - Halflife limit exceeded

- -

***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	1.4147E-01	1.4574E-01	2.6597E-01	2.6611E-01	2.832E-01
K-40		1.5537E+01	1.5537E+01	1.2850E+00	1.5790E+00	
MN-54	#A	-5.2644E-03	-5.2912E-03	2.8872E-02	2.8874E-02	2.916E-02
CO-57	#B	3.0015E-03	3.0192E-03	3.6364E-02	3.6364E-02	4.042E-02
CO-60	#B	3.4491E-04	3.4520E-04	2.8241E-02	2.8241E-02	3.488E-02
Sr-85	#A	-1.9273E-02	-1.9750E-02	3.9932E-02	3.9949E-02	4.293E-02
Kr-85	#A	-4.8405E+02	-4.8405E+02	1.0567E+03	1.0571E+03	9.968E+02
Y-88	#B	-1.1982E-03	-1.2162E-03	3.1246E-02	3.1246E-02	2.568E-02
NB-94	#B	-3.9344E-03	-3.9344E-03	2.8877E-02	2.8878E-02	3.165E-02
Ag-108M	#B	0.0000E+00	0.0000E+00	6.3091E-02	6.3091E-02	7.148E-02
CD-109	#A	-9.5862E-02	-9.6198E-02	1.2823E+00	1.2823E+00	1.349E+00
SN-113	#B	2.9698E-04	3.0110E-04	4.0239E-02	4.0239E-02	4.558E-02
SB-125	#B	5.8709E-02	5.8801E-02	5.9767E-02	5.9868E-02	9.016E-02
I-131	#B	1.2543E-02	1.5280E-02	3.1407E-02	3.1420E-02	2.845E-02
CS-134	#B	1.1124E-02	1.1147E-02	1.2884E-02	1.2901E-02	8.004E-02
CS-137	#	4.6193E-02	4.6200E-02	4.2669E-02	4.2756E-02	
CE-139	#A	-9.0926E-05	-9.1981E-05	3.2306E-01	3.2306E-01	4.128E-02
EU-152	#B	9.0051E-03	9.0082E-03	1.0537E-01	1.0537E-01	1.178E-01
EU-154	#B	5.8214E-03	5.8244E-03	6.9855E-02	6.9856E-02	7.821E-02
EU-155	#A	1.2534E-01	1.2545E-01	1.3361E-01	1.3379E-01	1.447E-01
HG-203	#F	4.6771E-02	4.8391E-02	6.0460E-02	6.0528E-02	3.541E-02
TL-208		2.4460E-01	2.4460E-01	4.8919E-02	5.1007E-02	
PB-212		7.2124E-01	7.2124E-01	8.5301E-02	9.5346E-02	
PB-214		5.3824E-01	5.3824E-01	1.1663E-01	1.2089E-01	
BI-212		5.3105E-01	5.3105E-01	3.5705E-01	3.5842E-01	
BI-214		5.3311E-01	5.3311E-01	1.2206E-01	1.2605E-01	
RA-224	#A	8.0283E-01	8.0283E-01	9.9930E-01	1.0004E+00	1.088E+00
RA-226	#	1.5621E+00	1.5621E+00	1.0306E+00	1.0347E+00	
AC-228		9.7931E-01	9.7931E-01	1.7403E-01	1.8339E-01	
TH-227	#A	-3.2100E-01	-3.2100E-01	3.7843E-01	3.7890E-01	4.094E-01
PA-234	#B	4.0903E-02	4.0903E-02	1.3560E-01	1.3561E-01	1.503E-01
TH-234	#B	1.1808E+00	1.1808E+00	9.8454E-01	9.8671E-01	1.895E+00
AM-241	#A	4.1813E-04	4.1813E-04	1.6189E-01	1.6189E-01	1.825E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.

H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (270.2 to 2000.1 keV) 2.0692312E+01 pCi/gm
Total Decayed Activity (270.2 to 2000.1 keV) 2.0692324E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JJM

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 107F_7SEP2006_1423.An1

Sample description
FSS-OOL-05-03-008-F-A

Spectrum Filename: C:\GammaVision\Spectra\107F_7SEP2006_1423.An1

Acquisition information
Start time: 07-Sep-2006 14:23:34
Live time: 2000
Real time: 2002
Dead time: 0.09 %
Detector ID: 2

Detector system
Det 107- DSPE- 634

Calibration
Filename: D7_1LSa.Clb
Detector 107 Calibration for 1 Liter Sand Marinelli

Energy Calibration
Created: 29-Oct-2004 06:48:53
Zero offset: 0.157 keV
Gain: 0.500 keV/channel
Quadratic: -1.676E-08 keV/channel^2

Efficiency Calibration
Created: 29-Oct-2004 06:51:32
Type: Polynomial
Uncertainty: 1.174 %
Coefficients: -0.279532 -4.778179 0.614896
-0.087174 0.005356 -0.000131

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.16keV)
Stop channel: 4000 (2000.15keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 1.4420E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.4420E+03) =
6.9348E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	05-Sep-2006 07:30:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	107_150K_28APR05.Pbc 01-May-2005 05:30:33
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 12 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.4362

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
76.13	566.	10.42	3.25	2.913E-02	72.87	6.400	3.114E+00	HG203
					74.81	9.600	1.927E+00	PB212
					77.11	10.700	1.663E+00	PB214
					77.11	17.500	1.025E+00	PB212
92.56	165.	25.12	1.51	3.433E-02	92.38	2.570	1.670E+00	TH234
					92.80	3.000	1.320E+00	TH234
185.90	94.	33.25	1.50	3.610E-02	185.99	3.280	PBC<MDA	RA226
238.75	546.	6.33	1.30	3.189E-02	238.63	43.100	3.614E-01	PB212
242.02	146.	20.54	1.30	3.163E-02	241.00	3.900	1.087E+00	RA224
					241.92	7.470	5.718E-01	PB214
295.06	185.	16.39	1.61	2.769E-02				
295.06	185.	16.39	1.61	2.769E-02	295.22	19.200	3.186E-01	PB214
338.45	170.	13.61	1.27	2.500E-02	338.40	12.010	5.211E-01	AC228
352.09	396.	7.39	2.35	2.425E-02	351.99	37.100	4.074E-01	PB214
462.90	34.	40.18	1.50	1.953E-02	463.51	10.000	PBC<MDA	SB125
510.99	100.	18.85	3.13	1.808E-02	510.72	22.500	2.312E-01	TL208
					513.99	0.004	1.216E+03	Kr85
					514.00	99.270	PBC<MDA	Sr85
583.61	270.	9.46	2.02	1.628E-02	583.14	86.000	1.777E-01	TL208
609.26	322.	7.62	2.36	1.574E-02	609.32	46.090	4.103E-01	BI214
727.84	70.	28.16	1.31	1.373E-02	723.30	19.700	2.392E-01	EU154
					727.17	11.800	3.959E-01	BI212
911.44	199.	12.70	1.75	1.160E-02	911.07	29.000	5.422E-01	AC228
968.43	166.	14.57	0.80	1.110E-02	968.90	17.460	7.933E-01	AC228
1119.86	95.	16.98	1.13	9.973E-03	1120.28	15.040	5.907E-01	BI214
1461.13	893.	3.35	2.60	8.189E-03	1460.75	10.700	9.498E+00	K40
1620.83	28.	24.17	1.02	7.569E-03	1620.56	2.750	1.247E+00	BI212

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
1765.18	57.	13.13	0.85	7.084E-03	1764.51	15.920	4.745E-01	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
477.14	238.73	324.	546.	0.273	18.99	1.297	PB-212	D
483.66	241.99	374.	146.	0.073	61.62	1.299	PB-214	D
703.79	352.09	448.	108.	0.054	88.20	2.350	PB-214	s

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-212	153.54	76.94	1030.	194.	0.097	71.87	1.500s
PB-214	153.89	77.11	988.	246.	0.123	56.30	1.500D
PB-212	153.89	77.11	983.	251.	0.125	56.30	1.500D
RA-226	371.43	185.90	445.	94.	0.047	99.76	1.500s
PB-212	477.12	238.74	671.	527.	0.264	23.77	1.500s
PB-214	590.00	295.19	275.	152.	0.076	50.51	1.500s
AC-228	676.51	338.45	144.	167.	0.083	40.82	1.266s
PB-214	703.77	352.08	199.	284.	0.142	27.03	1.500s
TL-208	1021.57	510.99	160.	100.	0.050	56.55	3.125s
TL-208	1166.81	583.61	105.	266.	0.133	28.38	2.022s
BI-214	1218.10	609.26	84.	318.	0.159	22.86	2.362s
BI-212	1455.26	727.84	82.	69.	0.034	84.49	1.308s
AC-228	1822.43	911.44	92.	195.	0.097	38.11	1.750s
AC-228	1936.43	968.43	88.	164.	0.082	43.72	0.804s
BI-214	2239.30	1119.86	51.	95.	0.047	50.94	1.134s
K-40	2921.86	1461.13	5.	888.	0.444	10.04	2.600s
BI-212	3241.29	1620.83	4.	28.	0.014	72.50	1.022s
BI-214	3530.02	1765.18	1.	57.	0.029	39.39	0.851s

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	MDA Value pCi/gm	COMMENTS
BE-7		5.9257E-02					
			477.56	5.926E-02	&(	2.288E-01 6.76E-02	G
K-40		9.4979E+00					
			1460.75	9.498E+00	*(P	1.373E-01 3.20E-01	G
MN-54		9.1820E-03					
			834.81	9.182E-03	&(P	2.862E-02 8.47E-03	G
CO-57		9.2331E-03					
			122.07	9.233E-03	&(P	3.153E-02 9.47E-03	G K
			136.43	7.969E-03	& P	2.485E-01 7.36E-02	G
CO-60		8.9170E-05					
			1332.51	8.917E-05	&(P	3.366E-02 9.11E-03	G K
			1173.23	5.090E-03	% P	3.982E-02 1.13E-02	G K
Sr-85		-1.2837E-02					
			514.00	-1.284E-02	%(	3.559E-02 1.07E-02	G
Kr-85		-3.2468E+02					
			513.99	-3.247E+02	%(P	8.080E+02 2.41E+02	G
Y-88		-4.5617E-03					
			1836.01	-4.562E-03	%(P	2.694E-02 7.14E-03	G K
			898.02	6.889E-03	& P	2.827E-02 8.17E-03	G
NB-94		3.6423E-03					
			871.10	3.642E-03	&(P	2.268E-02 6.46E-03	G K
			702.50	6.262E-03	% P	2.822E-02 8.26E-03	G K
Ag-108M		3.1252E-04					
			722.95	3.125E-04	%(	3.129E-02 8.89E-03	G K
			614.37	-1.753E-02	%	3.532E-02 1.07E-02	G
			433.93	-9.402E-03	% P	2.531E-02 7.50E-03	G
CD-109		6.5104E-01					
			88.04	6.510E-01	%(P	1.008E+00 3.08E-01	G
SN-113		9.6031E-03					
			391.71	9.603E-03	%(P	3.318E-02 9.81E-03	G K
			255.04	1.794E-01	%	1.132E+00 3.35E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	2.6272E-02						
		427.95	2.627E-02	%(P	6.881E-02	2.05E-02	G K
		600.77	-8.110E-03	& P	1.016E-01	2.79E-02	G
		636.15	4.864E-02	& P	1.981E-01	5.78E-02	G
		463.51	1.657E-01	% P	2.329E-01	7.20E-02	G
		176.29	8.476E-02	% P	3.953E-01	1.18E-01	G
I-131	-7.3209E-03						
		364.48	-7.321E-03	%(	3.664E-02	1.08E-02	G K
		636.97	3.002E-03	%	3.965E-01	1.12E-01	G
		284.29	7.448E-02	%	4.699E-01	1.39E-01	G
CS-134	-9.8085E-03						
		604.66	-9.809E-03	&(P	3.975E-02	1.18E-02	G K
		795.76	1.457E-02	% P	3.334E-02	1.00E-02	G
		569.29	2.020E-02	&	1.354E-01	3.90E-02	G
		801.84	1.055E-02	& P	3.384E-01	9.61E-02	G
CS-137	5.0667E-03						
		661.62	5.067E-03	&(P	3.060E-02	8.77E-03	G
CE-139	8.9636E-03						
		165.85	8.964E-03	%(P	2.990E-02	8.97E-03	G
EU-152	-1.6277E-03						
		121.78	-1.628E-03	&(P	8.507E-02	2.51E-02	G K
		344.30	-1.171E-02	% P	8.407E-02	2.46E-02	G
		1408.08	-1.534E-02	% P	1.310E-01	3.57E-02	G
		964.00	1.771E-03	& P	3.714E-01	1.08E-01	G
		1112.07	3.394E-02	& P	2.198E-01	6.27E-02	G
		778.90	-1.741E-02	% P	1.948E-01	5.50E-02	G
EU-154	1.8260E-02						
		123.10	1.826E-02	&(P	6.831E-02	2.05E-02	G K
		1274.80	1.604E-02	& P	9.715E-02	2.79E-02	G
		723.30	-4.786E-02	% P	1.584E-01	4.69E-02	G
		1004.80	-1.006E-03	% P	2.004E-01	5.67E-02	G
EU-155	5.6720E-02						
		86.45	5.672E-02	%(	1.247E-01	3.78E-02	G K
		105.31	-7.428E-04	% P	1.394E-01	4.13E-02	G
HG-203	1.3489E-02						
		279.17	1.349E-02	%(P	3.003E-02	9.07E-03	G K
		72.87	2.748E-01	% P	8.889E-01	2.68E-01	G
		70.83	-5.570E-01	%	1.582E+00	4.78E-01	G
		82.50	0.000E+00	%	2.056E+00	6.13E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	1.7771E-01						
		583.14	1.777E-01	*(P	3.381E-02	1.71E-02	G
		510.72	2.312E-01	+ P	1.419E-01	5.82E-02	G
PB-212	3.5956E-01						
		238.63	3.596E-01	*(P	8.411E-02	2.93E-02	G K
							Energy duplication
		77.11	4.543E-01	+	2.695E-01	8.53E-02	G
		74.81	6.651E-01	+ P	5.216E-01	1.62E-01	G
PB-214	2.8617E-01						
		351.99	2.952E-01	*(P	7.128E-02	2.71E-02	G K
		295.22	2.687E-01	*(P	1.411E-01	4.66E-02	G
							Energy duplication
		77.11	7.290E-01	+ P	4.418E-01	1.39E-01	G
		241.92	5.499E-02	& P	5.606E-01	1.67E-01	G
BI-212	3.9593E-01						
		727.17	3.959E-01	@(P	2.602E-01	1.14E-01	G K
		1620.56	1.247E+00	+ P	5.572E-01	3.07E-01	G
		785.42	7.355E-01	% P	1.189E+00	3.67E-01	G
BI-214	4.2680E-01						
		609.32	4.103E-01	*(P	5.877E-02	3.17E-02	G K
		1764.51	4.745E-01	(P	6.125E-02	6.33E-02	G
		1120.28	5.907E-01	+ P	2.259E-01	1.01E-01	G
RA-224	3.7938E-01						
		241.00	3.794E-01	&(P	9.736E-01	2.94E-01	G
RA-226	7.4669E-01						
		185.99	7.467E-01	*(	7.994E-01	2.48E-01	G
AC-228	5.3603E-01						
		911.07	5.422E-01	*(P	1.321E-01	7.04E-02	G K
		968.90	7.933E-01	+ P	2.247E-01	1.17E-01	G
		338.40	5.211E-01	*(P	1.830E-01	7.23E-02	G
TH-227	2.0615E-03						
		236.00	2.062E-03	%(P	3.712E-01	1.11E-01	G K
		256.25	4.812E-02	% P	3.525E-01	1.04E-01	G
PA-234	2.3301E-04						
		98.44	2.330E-04	%(	1.212E-01	3.59E-02	G K
		946.00	-2.938E-02	&	1.635E-01	4.75E-02	G
		131.28	-5.444E-02	&	1.254E-01	3.79E-02	G
		94.67	2.699E-02	%	1.885E-01	5.62E-02	G
		883.24	2.055E-03	&	2.056E-01	5.71E-02	G
		926.70	8.166E-04	%	2.296E-01	6.36E-02	G

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 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26 2.993E-02 &   2.004E-01 5.78E-02 G

TH-234       1.7270E-01
                           63.29 1.727E-01 %(P 1.557E+00 4.63E-01 G K
                           92.80 8.057E-01 % P 1.230E+00 3.74E-01 G
                           92.38 9.008E-01 % P 1.472E+00 4.48E-01 G

AM-241      -4.2847E-02
                           59.54-4.285E-02 &(P 2.121E-01 6.36E-02 G
   ( - This peak used in the nuclide activity average.

   * - Peak is too wide, but only one peak in library.
   ! - Peak is part of a multiplet and this area went
       negative during deconvolution.
   ? - Peak is too narrow.
   @ - Peak is too wide at FW25M, but ok at FWHM.
   % - Peak fails sensitivity test.
   $ - Peak identified, but first peak of this nuclide
       failed one or more qualification tests.
   + - Peak activity higher than counting uncertainty range.
   - - Peak activity lower than counting uncertainty range.
   = - Peak outside analysis energy range.
   & - Calculated peak centroid is not close enough to the
       library energy centroid for positive identification.
   P - Peakbackground subtraction
   } - Peak is too close to another for the activity
       to be found directly.

   Nuclide Codes:                      Peak Codes:
   T - Thermal Neutron Activation      G - Gamma Ray
   F - Fast Neutron Activation         X - X-Ray
   I - Fission Product                 P - Positron Decay
   N - Naturally Occurring Isotope     S - Single-Escape
   P - Photon Reaction                 D - Double-Escape
   C - Charged Particle Reaction       K - Key Line
   M - No MDA Calculation              A - Not in Average
   R - Coincidence Corrected           C - Coincidence Peak
   H - Halflife limit exceeded

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
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***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	5.7524E-02	5.9257E-02	2.0276E-01	2.0279E-01	2.221E-01
K-40	#	9.4979E+00	9.4979E+00	9.5859E-01	1.1107E+00	
MN-54	#A	9.1354E-03	9.1820E-03	2.5402E-02	2.5407E-02	2.847E-02
CO-57	#B	9.1790E-03	9.2331E-03	2.8410E-02	2.8415E-02	3.134E-02
CO-60	#B	8.9097E-05	8.9170E-05	2.7321E-02	2.7321E-02	3.363E-02

Sr-85	#A	-1.2527E-02	-1.2837E-02	3.2057E-02	3.2066E-02	3.473E-02
Kr-85	#A	-3.2467E+02	-3.2468E+02	9.0370E+02	9.0390E+02	8.080E+02
Y-88	#B	-4.4944E-03	-4.5617E-03	3.5609E-02	3.5610E-02	2.654E-02
NB-94	#B	3.6423E-03	3.6423E-03	1.9378E-02	1.9379E-02	2.268E-02
Ag-108M	#B	3.1251E-04	3.1252E-04	2.6680E-02	2.6680E-02	3.129E-02
CD-109	#A	6.4877E-01	6.5104E-01	9.2310E-01	9.2380E-01	1.004E+00
SN-113	#B	9.4718E-03	9.6031E-03	2.9438E-02	2.9443E-02	3.273E-02
SB-125	#B	2.6230E-02	2.6272E-02	6.1629E-02	6.1649E-02	6.870E-02
I-131	#B	-6.0107E-03	-7.3209E-03	3.2498E-02	3.2501E-02	3.008E-02
CS-134	#B	-9.7879E-03	-9.8085E-03	3.7754E-02	3.7758E-02	3.967E-02
CS-137	#A	5.0659E-03	5.0667E-03	2.6323E-02	2.6325E-02	3.060E-02
CE-139	#A	8.8609E-03	8.9636E-03	2.6918E-02	2.6923E-02	2.956E-02
EU-152	#B	-1.6271E-03	-1.6277E-03	8.7094E-02	8.7094E-02	8.504E-02
EU-154	#B	1.8251E-02	1.8260E-02	6.1493E-02	6.1501E-02	6.828E-02
EU-155	#B	5.6670E-02	5.6720E-02	1.1332E-01	1.1337E-01	1.245E-01
HG-203	#B	1.3038E-02	1.3489E-02	2.7223E-02	2.7235E-02	2.903E-02
TL-208	#	1.7771E-01	1.7771E-01	5.1291E-02	5.2354E-02	
PB-212	#	3.5956E-01	3.5956E-01	8.8035E-02	9.0560E-02	8.411E-02
PB-214	#	2.8617E-01	2.8617E-01	7.8761E-02	8.0554E-02	7.128E-02
BI-212	#	3.9593E-01	3.9593E-01	3.4083E-01	3.4163E-01	
BI-214		4.2680E-01	4.2680E-01	9.8666E-02	1.0184E-01	
RA-224	#A	3.7938E-01	3.7938E-01	8.8179E-01	8.8208E-01	9.736E-01
RA-226	#A	7.4669E-01	7.4669E-01	7.4489E-01	7.4620E-01	7.994E-01
AC-228	#	5.3603E-01	5.3603E-01	1.5272E-01	1.5597E-01	
TH-227	#B	2.0615E-03	2.0615E-03	3.3158E-01	3.3158E-01	3.712E-01
PA-234	#B	2.3301E-04	2.3301E-04	1.0780E-01	1.0780E-01	1.212E-01
TH-234	#B	1.7270E-01	1.7270E-01	1.3877E+00	1.3878E+00	1.557E+00
AM-241	#A	-4.2846E-02	-4.2847E-02	2.0003E-01	2.0004E-01	2.121E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (260.7 to 2000.1 keV) 1.1034416E+01 pCi/gm
Total Decayed Activity (260.7 to 2000.1 keV) 1.1034416E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JJM

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 107F_7SEPT2006_0932.An1

Sample description
FSS-OOL-05-03-015-F

Spectrum Filename: C:\GammaVision\Spectra\107F_7SEPT2006_0932.An1

Acquisition information
Start time: 07-Sep-2006 09:32:42
Live time: 2000
Real time: 2002
Dead time: 0.11 %
Detector ID: 2

Detector system
Det 107- DSPE- 634

Calibration
Filename: D7_1LSa.Clb
Detector 107 Calibration for 1 Liter Sand Marinelli

Energy Calibration
Created: 29-Oct-2004 06:48:53
Zero offset: 0.157 keV
Gain: 0.500 keV/channel
Quadratic: -1.676E-08 keV/channel^2

Efficiency Calibration
Created: 29-Oct-2004 06:51:32
Type: Polynomial
Uncertainty: 1.174 %
Coefficients: -0.279532 -4.778179 0.614896
-0.087174 0.005356 -0.000131

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.16keV)
Stop channel: 4000 (2000.15keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 1.6770E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.6770E+03) =
5.9630E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	01-Sep-2006 07:45:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	107_150K_28APR05.Pbc 01-May-2005 05:30:33
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 12 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.3489

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
76.10	755.	9.15	3.05	2.912E-02	74.81	9.600	2.213E+00	PB212
					77.11	10.700	1.911E+00	PB214
					77.11	17.500	1.176E+00	PB212
92.74	167.	29.48	1.40	3.437E-02	92.38	2.570	1.454E+00	TH234
					92.80	3.000	PBC<MDA	TH234
239.03	1258.	4.81	2.01	3.186E-02	238.63	43.100	7.282E-01	PB212
295.19	192.	12.65	1.34	2.766E-02	295.22	19.200	2.835E-01	PB214
300.39	67.	28.95	1.34	2.731E-02				
338.74	214.	14.22	1.89	2.498E-02	338.40	12.010	5.651E-01	AC228
352.08	514.	7.00	1.91	2.425E-02	351.99	37.100	4.552E-01	PB214
461.92	101.	20.66	1.61	1.958E-02				
461.92	101.	20.66	1.61	1.958E-02	463.51	10.000	4.085E-01	SB125
510.59	41.	26.27	1.50	1.808E-02	510.72	22.500	PBC<MDA	TL208
583.55	365.	7.08	2.42	1.628E-02	583.14	86.000	2.073E-01	TL208
609.47	379.	7.32	2.75	1.574E-02	609.32	46.090	4.158E-01	BI214
726.68	51.	25.55	1.64	1.380E-02	723.30	19.700	1.526E-01	EU154
728.58	97.	19.98	2.14	1.374E-02	723.30	19.700	2.886E-01	EU154
					727.17	11.800	4.831E-01	BI212
911.26	261.	8.48	2.44	1.161E-02	911.07	29.000	6.142E-01	AC228
968.23	207.	10.28	2.12	1.110E-02	968.90	17.460	8.503E-01	AC228
1121.27	93.	22.86	1.58	9.970E-03	1120.28	15.040	5.009E-01	BI214
1461.02	1135.	3.04	2.82	8.190E-03	1460.75	10.700	1.039E+01	K40
1764.47	81.	11.67	2.43	7.084E-03	1764.51	15.920	5.817E-01	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
151.86	76.10	1740.	313.	0.157	59.01	3.052	BI-207	s
185.15	92.74	903.	167.	0.083	88.45	1.402	TH-234	l
477.69	239.03	1416.	490.	0.245	35.29	2.006	PB-212	s
600.86	300.62	181.	49.	0.024	124.12	1.288	PB-212	
703.78	352.08	605.	131.	0.065	84.08	1.910	PB-214	s
923.43	461.92	120.	102.	0.051	54.11	1.610	CS-138	
1166.68	583.55	347.	110.	0.055	77.20	2.422	TL-208	s

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-212	152.96	76.65	1496.	218.	0.109	76.71	1.500s
PB-214	153.89	77.11	1459.	216.	0.108	76.03	1.500D
PB-212	153.89	77.11	1454.	221.	0.110	76.03	1.500D
TH-227	471.38	235.87	1296.	-166.	-0.083	95.08	1.500s
PB-212	477.17	238.77	815.	786.	0.393	18.34	1.500s
PB-214	590.07	295.22	361.	180.	0.090	48.58	1.500s
AC-228	677.10	338.74	225.	211.	0.105	42.67	1.889s
PB-214	703.72	352.06	191.	378.	0.189	21.53	1.500s
TL-208	1166.37	583.40	135.	250.	0.125	26.75	1.540s
BI-214	1218.53	609.47	110.	374.	0.187	21.96	2.752s
EU-154	1452.92	726.68	62.	51.	0.026	76.65	1.635s
BI-212	1456.73	728.58	84.	97.	0.049	59.94	2.137s
AC-228	1822.08	911.26	71.	257.	0.128	25.44	2.438s
AC-228	1936.01	968.23	67.	204.	0.102	30.85	2.116s
BI-214	2242.11	1121.27	91.	93.	0.047	68.58	1.584s
K-40	2921.64	1461.02	18.	1130.	0.565	9.13	2.817s
BI-214	3528.60	1764.47	4.	81.	0.041	35.02	2.426

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	Peak MDA Value pCi/gm	COMMENTS
BE-7		-6.3748E-02					
			477.56	-6.375E-02	%(	2.600E-01 7.71E-02	G
K-40		1.0390E+01					
			1460.75	1.039E+01	*(P	2.063E-01 3.17E-01	G
MN-54		1.6254E-03					
			834.81	1.625E-03	%(P	3.053E-02 8.77E-03	G
CO-57		1.7918E-04					
			122.07	1.792E-04	%(P	3.248E-02 9.65E-03	G K
			136.43	2.447E-02	& P	2.694E-01 8.04E-02	G
CO-60		-5.4594E-03					
			1332.51	-5.459E-03	&(P	2.835E-02 7.55E-03	G K
			1173.23	-9.283E-03	% P	3.843E-02 1.09E-02	G K
Sr-85		-4.4450E-03					
			514.00	-4.445E-03	%(	3.168E-02 9.33E-03	G
Kr-85		-1.2733E+02					
			513.99	-1.273E+02	%(P	6.908E+02 2.02E+02	G
Y-88		-2.4864E-03					
			1836.01	-2.486E-03	%(P	2.118E-02 5.36E-03	G K
			898.02	3.953E-03	% P	2.791E-02 7.98E-03	G
NB-94		4.7529E-03					
			871.10	4.753E-03	%(P	2.259E-02 6.55E-03	G K
			702.50	3.526E-04	& P	2.664E-02 7.62E-03	G K
Ag-108M		0.0000E+00					
			722.95	0.000E+00	%(	4.578E-02 1.34E-02	G K
			614.37	-1.297E-02	%	3.367E-02 1.01E-02	G
			433.93	5.401E-03	& P	2.251E-02 6.63E-03	G
CD-109		-2.3558E-03					
			88.04	-2.356E-03	%(P	1.108E+00 3.31E-01	G
SN-113		3.1503E-03					
			391.71	3.150E-03	&(P	2.957E-02 8.57E-03	G K
			255.04	1.121E-01	%	1.146E+00 3.39E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	2.5487E-03						
		427.95	2.549E-03	%(P	6.263E-02	1.80E-02	G K
		600.77	-1.469E-02	% P	1.311E-01	3.76E-02	G
		636.15	-4.830E-03	& P	2.022E-01	5.73E-02	G
		463.51	-1.607E-02	& P	2.733E-01	7.91E-02	G
		176.29	7.397E-03	% P	3.928E-01	1.16E-01	G
I-131	-4.1611E-03						
		364.48	-4.161E-03	&(	4.540E-02	1.33E-02	G K
		636.97	-7.418E-02	&	5.537E-01	1.61E-01	G
		284.29	-1.243E-01	%	6.671E-01	1.98E-01	G
CS-134	-2.6658E-03						
		604.66	-2.666E-03	%(P	2.868E-02	8.33E-03	G K
		795.76	1.818E-02	% P	2.668E-02	8.32E-03	G
		569.29	2.589E-02	%	1.454E-01	4.25E-02	G
		801.84	-6.034E-02	& P	3.208E-01	9.35E-02	G
CS-137	-1.1555E-02						
		661.62	-1.155E-02	%(P	3.524E-02	1.03E-02	G
CE-139	-1.7575E-03						
		165.85	-1.757E-03	%(P	3.439E-02	1.02E-02	G
EU-152	-2.0047E-02						
		121.78	-2.005E-02	%(P	8.734E-02	2.62E-02	G K
		344.30	-1.250E-02	% P	8.393E-02	2.47E-02	G
		1408.08	1.037E-02	% P	1.175E-01	3.25E-02	G
		964.00	1.679E-02	& P	1.844E-01	5.26E-02	G
		1112.07	1.311E-01	% P	2.086E-01	6.46E-02	G
		778.90	-2.694E-02	% P	2.126E-01	6.14E-02	G
EU-154	4.9930E-02						
		123.10	-7.572E-05	%(P	6.410E-02	1.90E-02	G K
		1274.80	-2.125E-02	% P	1.050E-01	3.06E-02	G
		723.30	1.526E-01	?(P	1.172E-01	3.93E-02	G
		1004.80	-3.061E-02	& P	1.719E-01	4.99E-02	G
EU-155	6.3530E-02						
		86.45	6.353E-02	%(	1.266E-01	3.84E-02	G K
		105.31	6.918E-05	& P	1.356E-01	4.03E-02	G
HG-203	2.5187E-03						
		279.17	2.519E-03	%(P	2.967E-02	8.74E-03	G K
		72.87	-2.785E-01	% P	9.494E-01	2.86E-01	G
		70.83	-3.872E-01	%	1.566E+00	4.71E-01	G
		82.50	-5.880E-01	%	1.770E+00	5.34E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	1.4396E-01						
		583.14	1.440E-01	*(P	3.273E-02	1.31E-02	G
		510.72	8.074E-02	% P	1.318E-01	3.87E-02	G
PB-212	4.6048E-01						
		238.63	4.605E-01	*(P	7.956E-02	2.87E-02	G K
							Energy duplication
		77.11	3.436E-01	-	2.809E-01	8.71E-02	G
		74.81	6.409E-01	+ P	5.389E-01	1.67E-01	G
PB-214	3.3820E-01						
		351.99	3.382E-01	*(P	6.013E-02	2.46E-02	G K
		295.22	2.737E-01	- P	1.383E-01	4.54E-02	G
							Energy duplication
		77.11	5.499E-01	+ P	4.601E-01	1.42E-01	G
		241.92	-2.450E-01	% P	5.716E-01	1.73E-01	G
BI-212	4.8306E-01						
		727.17	4.831E-01	*(P	2.254E-01	9.79E-02	G K
		1620.56	4.681E-02	% P	8.975E-01	2.43E-01	G
		785.42	7.795E-01	% P	1.109E+00	3.46E-01	G
BI-214	4.3674E-01						
		609.32	4.158E-01	*(P	5.720E-02	3.08E-02	G K
		1764.51	5.817E-01	+ P	8.251E-02	6.86E-02	G
		1120.28	5.009E-01	*(P	2.532E-01	1.16E-01	G
RA-224	-2.4008E-01						
		241.00	-2.401E-01	&(P	7.325E-01	2.20E-01	G
RA-226	5.0649E-01						
		185.99	5.065E-01	%(	8.188E-01	2.50E-01	G
AC-228	5.9979E-01						
		911.07	6.142E-01	*(P	1.008E-01	5.30E-02	G K
		968.90	8.503E-01	+ P	1.696E-01	8.83E-02	G
		338.40	5.651E-01	*(P	1.950E-01	8.17E-02	G
TH-227	-3.7187E-01						
		236.00	-3.719E-01	?(P	3.820E-01	1.18E-01	G K
		256.25	3.779E-02	% P	3.388E-01	1.00E-01	G
PA-234	1.2688E-03						
		98.44	1.269E-03	%(	1.247E-01	3.71E-02	G K
		946.00	-1.004E-03	&	1.242E-01	3.48E-02	G
		131.28	4.069E-03	%	1.406E-01	4.19E-02	G
		94.67	-1.272E-01	%	2.433E-01	7.39E-02	G
		883.24	-5.834E-02	&	2.216E-01	6.52E-02	G
		926.70	6.876E-02	&	2.176E-01	6.43E-02	G

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 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26 3.903E-02 %   2.143E-01 6.27E-02 G

TH-234       9.4359E-02
                           63.29 9.436E-02 &(P 1.412E+00 4.19E-01 G K
                           92.80 6.742E-01 % P 1.230E+00 3.72E-01 G
                           92.38 8.724E-01 % P 1.411E+00 4.29E-01 G

AM-241       3.9251E-02
                           59.54 3.925E-02 %(P 1.994E-01 5.98E-02 G
   ( - This peak used in the nuclide activity average.

   * - Peak is too wide, but only one peak in library.
   ! - Peak is part of a multiplet and this area went
       negative during deconvolution.
   ? - Peak is too narrow.
   @ - Peak is too wide at FW25M, but ok at FWHM.
   % - Peak fails sensitivity test.
   $ - Peak identified, but first peak of this nuclide
       failed one or more qualification tests.
   + - Peak activity higher than counting uncertainty range.
   - - Peak activity lower than counting uncertainty range.
   = - Peak outside analysis energy range.
   & - Calculated peak centroid is not close enough to the
       library energy centroid for positive identification.
   P - Peakbackground subtraction
   } - Peak is too close to another for the activity
       to be found directly.

   Nuclide Codes:                      Peak Codes:
   T - Thermal Neutron Activation      G - Gamma Ray
   F - Fast Neutron Activation         X - X-Ray
   I - Fission Product                 P - Positron Decay
   N - Naturally Occurring Isotope     S - Single-Escape
   P - Photon Reaction                 D - Double-Escape
   C - Charged Particle Reaction       K - Key Line
   M - No MDA Calculation              A - Not in Average
   R - Coincidence Corrected           C - Coincidence Peak
   H - Halflife limit exceeded

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
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***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	-5.8915E-02	-6.3748E-02	2.3136E-01	2.3139E-01	2.403E-01
K-40	#	1.0390E+01	1.0390E+01	9.5213E-01	1.1327E+00	
MN-54	#A	1.6036E-03	1.6254E-03	2.6324E-02	2.6324E-02	3.013E-02
CO-57	#B	1.7640E-04	1.7918E-04	2.8954E-02	2.8954E-02	3.198E-02
CO-60	#B	-5.4475E-03	-5.4594E-03	1.0130E-01	1.0130E-01	2.829E-02

Sr-85	#A	-4.1655E-03	-4.4450E-03	2.8004E-02	2.8005E-02	2.969E-02
Kr-85	#A	-1.2733E+02	-1.2733E+02	9.9856E+02	9.9859E+02	6.908E+02
Y-88	#B	-2.3901E-03	-2.4864E-03	3.7697E-02	3.7697E-02	2.036E-02
NB-94	#B	4.7529E-03	4.7529E-03	1.9644E-02	1.9646E-02	2.259E-02
Ag-108M	#B	0.0000E+00	0.0000E+00	4.0088E-02	4.0088E-02	4.578E-02
CD-109	#A	-2.3340E-03	-2.3558E-03	1.5043E+01	1.5043E+01	1.098E+00
SN-113	#B	3.0371E-03	3.1503E-03	2.5700E-02	2.5700E-02	2.851E-02
SB-125	#B	2.5381E-03	2.5487E-03	5.3858E-02	5.3859E-02	6.237E-02
I-131	#B	-2.4647E-03	-4.1611E-03	3.9915E-02	3.9915E-02	2.689E-02
CS-134	#B	-2.6510E-03	-2.6658E-03	3.0728E-02	3.0728E-02	2.852E-02
CS-137	#A	-1.1551E-02	-1.1555E-02	4.6140E-02	4.6145E-02	3.523E-02
CE-139	#A	-1.7045E-03	-1.7575E-03	3.4187E-02	3.4187E-02	3.336E-02
EU-152	#B	-2.0029E-02	-2.0047E-02	7.9339E-02	7.9347E-02	8.726E-02
EU-154	#B	4.9862E-02	4.9930E-02	3.8600E-02	3.8699E-02	6.401E-02
EU-155	#B	6.3382E-02	6.3530E-02	1.1532E-01	1.1537E-01	1.263E-01
HG-203	#B	2.3011E-03	2.5187E-03	2.6214E-02	2.6214E-02	2.710E-02
TL-208	#	1.4396E-01	1.4396E-01	3.9208E-02	4.0120E-02	3.273E-02
PB-212	#	4.6048E-01	4.6048E-01	8.6139E-02	9.0330E-02	7.956E-02
PB-214	#	3.3820E-01	3.3820E-01	7.3811E-02	7.6466E-02	6.013E-02
BI-212	#	4.8306E-01	4.8306E-01	2.9336E-01	2.9474E-01	
BI-214		4.3674E-01	4.3674E-01	9.7008E-02	1.0038E-01	
RA-224	#A	-2.4008E-01	-2.4008E-01	7.4473E-01	7.4487E-01	7.325E-01
RA-226	#A	5.0648E-01	5.0649E-01	7.4966E-01	7.5026E-01	8.188E-01
AC-228	#	5.9979E-01	5.9979E-01	1.5132E-01	1.5541E-01	
TH-227	#A	-3.7187E-01	-3.7187E-01	3.5417E-01	3.5485E-01	3.820E-01
PA-234	#B	1.2688E-03	1.2688E-03	1.1137E-01	1.1137E-01	1.247E-01
TH-234	#B	9.4359E-02	9.4359E-02	1.2584E+00	1.2584E+00	1.412E+00
AM-241	#A	3.9250E-02	3.9251E-02	1.7947E-01	1.7949E-01	1.994E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (50.2 to 2000.1 keV) 1.1909749E+01 pCi/gm
Total Decayed Activity (50.2 to 2000.1 keV) 1.1909749E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JPK

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 107F_7SEPT2006_1014.An1

Sample description
FSS-OOL-05-03-011-F

Spectrum Filename: C:\GammaVision\Spectra\107F_7SEPT2006_1014.An1

Acquisition information
Start time: 07-Sep-2006 10:13:58
Live time: 2000
Real time: 2003
Dead time: 0.13 %
Detector ID: 2

Detector system
Det 107- DSPE- 634

Calibration
Filename: D7_1LSa.Clb
Detector 107 Calibration for 1 Liter Sand Marinelli

Energy Calibration
Created: 29-Oct-2004 06:48:53
Zero offset: 0.157 keV
Gain: 0.500 keV/channel
Quadratic: -1.676E-08 keV/channel^2

Efficiency Calibration
Created: 29-Oct-2004 06:51:32
Type: Polynomial
Uncertainty: 1.174 %
Coefficients: -0.279532 -4.778179 0.614896
-0.087174 0.005356 -0.000131

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.16keV)
Stop channel: 4000 (2000.15keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 1.7860E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.7860E+03) =
5.5991E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	01-Sep-2006 07:35:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	107_150K_28APR05.Pbc 01-May-2005 05:30:33
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 17 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.3304

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
76.21	891.	8.76	3.28	2.917E-02	74.81	9.600	2.454E+00	PB212
					77.11	17.500	1.303E+00	PB212
					77.11	10.700	2.119E+00	PB214
86.64	137.	39.50	0.76	3.289E-02	86.45	32.740	9.636E-02	EU155
					88.04	3.790	PBC<MDA	CD109
186.38	175.	26.85	1.98	3.607E-02	185.99	3.280	1.119E+00	RA226
209.34	109.	32.64	1.59	3.428E-02				
239.11	1735.	4.06	2.44	3.186E-02	238.63	43.100	9.461E-01	PB212
242.07	172.	21.91	1.30	3.163E-02	241.92	7.470	5.513E-01	PB214
295.34	321.	13.18	1.56	2.767E-02	295.22	19.200	4.509E-01	PB214
338.65	234.	12.72	2.08	2.499E-02	338.40	12.010	5.815E-01	AC228
352.12	509.	6.53	1.94	2.425E-02	351.99	37.100	4.236E-01	PB214
463.52	77.	23.69	2.12	1.953E-02	463.51	10.000	2.894E-01	SB125
510.84	223.	15.32	2.68	1.808E-02	510.72	22.500	3.514E-01	TL208
583.29	467.	6.18	2.29	1.629E-02	583.14	86.000	2.496E-01	TL208
609.67	432.	8.27	2.08	1.574E-02	609.32	46.090	4.464E-01	BI214
727.76	124.	16.50	2.12	1.374E-02	727.17	11.800	5.791E-01	BI212
785.79	37.	38.73	1.68	1.297E-02	785.42	2.000	PBC<MDA	BI212
795.24	60.	31.78	1.75	1.285E-02				
795.24	60.	31.78	1.75	1.285E-02	795.76	85.400	4.127E-02	CS134
911.26	339.	9.80	2.66	1.161E-02	911.07	29.000	7.524E-01	AC228
968.39	278.	9.17	2.77	1.110E-02	964.00	14.580	1.296E+00	EU152
					968.90	17.460	1.077E+00	AC228
1120.29	93.	19.09	2.44	9.970E-03	1120.28	15.040	4.699E-01	BI214
1461.02	1647.	2.53	2.95	8.190E-03	1460.75	10.700	1.418E+01	K40
1621.43	17.	38.49	1.33	7.569E-03	1620.56	2.750	PBC<MDA	BI212
1765.03	84.	11.44	0.94	7.084E-03	1764.51	15.920	5.663E-01	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
172.95	86.64	1156.	137.	0.068	118.51	0.763	NP-237	l
418.31	209.34	506.	109.	0.055	97.91	1.592	AC-228	s

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-212	149.29	74.81	850.	241.	0.120	54.00	1.178D
PB-212	153.89	77.11	895.	262.	0.131	47.66	1.179A
PB-214	153.89	77.11	1537.	150.	0.075	99.47	1.500A
RA-226	372.40	186.38	755.	175.	0.088	80.56	1.977s
TH-227	470.67	235.52	1458.	-173.	-0.086	96.51	1.500s
PB-212	476.89	238.63	646.	960.	0.480	14.54	1.297D
PB-214	483.47	241.92	638.	172.	0.086	65.72	1.299D
PB-214	590.29	295.34	464.	317.	0.158	39.54	1.562s
AC-228	676.91	338.65	264.	231.	0.115	38.17	2.076s
PB-214	703.85	352.12	226.	504.	0.252	19.60	1.936s
SB-125	926.62	463.51	147.	67.	0.034	81.01	1.500D
TL-208	1021.27	510.84	263.	189.	0.094	45.96	2.676s
TL-208	1166.17	583.29	130.	462.	0.231	18.53	2.293s
BI-214	1218.91	609.67	206.	428.	0.214	24.81	2.077s
Ag-108M	1223.81	612.11	320.	-85.	-0.043	94.94	1.561s
BI-212	1455.09	727.76	96.	124.	0.062	49.50	2.116s
BI-212	1571.15	785.79	93.	37.	0.019	116.19	1.677
CS-134	1589.53	794.98	74.	46.	0.023	89.06	1.684s
AC-228	1822.09	911.26	160.	335.	0.167	29.40	2.661s
AC-228	1936.34	968.39	95.	276.	0.138	27.51	2.766s
BI-214	2240.15	1120.29	77.	93.	0.047	57.27	2.435s
K-40	2921.64	1461.02	26.	1643.	0.821	7.59	2.945s
BI-212	3242.48	1621.43	11.	17.	0.009	115.47	1.333s
BI-214	3529.71	1765.03	4.	84.	0.042	34.33	0.937s

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	MDA Value pCi/gm	COMMENTS
BE-7		7.4374E-02					
			477.56	7.437E-02	%(	2.309E-01 6.89E-02	G
K-40		1.4181E+01					
			1460.75	1.418E+01	*(P	2.302E-01 3.60E-01	G
MN-54		-1.0762E-03					
			834.81	-1.076E-03	&(P	3.268E-02 9.42E-03	G
CO-57		-1.1547E-02					
			122.07	-1.155E-02	%(P	3.722E-02 1.12E-02	G K
			136.43	3.048E-02	% P	2.801E-01 8.38E-02	G
CO-60		5.2458E-03					
			1332.51	5.246E-03	&(P	3.093E-02 8.77E-03	G K
			1173.23	-4.878E-03	% P	4.554E-02 1.30E-02	G K
Sr-85		-1.2599E-02					
			514.00	-1.260E-02	%(	3.631E-02 1.09E-02	G
Kr-85		-3.0180E+02					
			513.99	-3.018E+02	%(P	7.894E+02 2.36E+02	G
Y-88		1.7186E-03					
			1836.01	1.719E-03	%(P	2.141E-02 5.63E-03	G K
			898.02	2.243E-03	& P	3.461E-02 9.96E-03	G
NB-94		8.0366E-03					
			871.10	8.037E-03	%(P	2.254E-02 6.71E-03	G K
			702.50	-2.860E-04	& P	2.909E-02 8.37E-03	G K
Ag-108M		-1.5972E-02					
			722.95	-1.597E-02	%(	3.897E-02 1.17E-02	G K
			614.37	-4.555E-02	+	4.608E-02 1.44E-02	G
			433.93	9.902E-04	% P	2.654E-02 7.72E-03	G
CD-109		7.0853E-01					
			88.04	7.085E-01	&(P	1.079E+00 3.29E-01	G
SN-113		8.3457E-03					
			391.71	8.346E-03	%(P	3.686E-02 1.09E-02	G K
			255.04	1.551E-01	&	1.161E+00 3.45E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	4.7204E-02						
		427.95	-2.524E-02	&(P	8.718E-02	2.59E-02	G K
		600.77	-2.320E-02	& P	1.438E-01	4.19E-02	G
		636.15	-6.077E-02	& P	2.417E-01	7.14E-02	G
							Energy duplication
		463.51	2.616E-01	@(P	2.302E-01	7.36E-02	G
		176.29	-1.539E-01	% P	4.346E-01	1.31E-01	G
I-131	3.6548E-03						
		364.48	3.655E-03	%(	4.519E-02	1.33E-02	G K
		636.97	1.395E-01	&	5.109E-01	1.51E-01	G
		284.29	-1.412E-01	%	7.123E-01	2.13E-01	G
CS-134	1.8537E-02						
		604.66	6.635E-03	%(P	2.151E-02	6.37E-03	G K
		795.76	3.214E-02	(P	2.966E-02	9.65E-03	G
		569.29	-2.388E-02	%	1.648E-01	4.83E-02	G
		801.84	-8.918E-02	% P	3.386E-01	1.00E-01	G
CS-137	1.6847E-02						
		661.62	1.685E-02	%(P	3.266E-02	9.88E-03	G
CE-139	-9.6176E-03						
		165.85	-9.618E-03	%(P	3.603E-02	1.08E-02	G
EU-152	-3.4155E-02						
		121.78	-3.415E-02	%(P	1.046E-01	3.16E-02	G K
		344.30	-9.519E-05	% P	8.810E-02	2.58E-02	G
		1408.08	1.236E-03	% P	1.454E-01	4.05E-02	G
		964.00	2.001E-02	& P	3.419E-01	1.00E-01	G
		1112.07	8.640E-02	% P	2.245E-01	6.71E-02	G
		778.90	-2.465E-03	% P	1.921E-01	5.44E-02	G
EU-154	-2.3782E-02						
		123.10	-2.378E-02	%(P	7.550E-02	2.28E-02	G K
		1274.80	2.063E-03	% P	9.108E-02	2.58E-02	G
		723.30	-7.619E-02	% P	1.855E-01	5.58E-02	G
		1004.80	5.442E-03	% P	1.662E-01	4.74E-02	G
EU-155	8.4923E-02						
		86.45	8.492E-02	%(	1.306E-01	3.98E-02	G K
		105.31	1.602E-03	% P	1.529E-01	4.56E-02	G
HG-203	-8.1982E-03						
		279.17	-8.198E-03	&(P	3.599E-02	1.07E-02	G K
		72.87	-3.978E-01	% P	1.058E+00	3.20E-01	G
		70.83	-8.511E-01	%	1.689E+00	5.13E-01	G
		82.50	-3.915E-02	%	2.150E+00	6.43E-01	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments

TL-208       2.4956E-01
                          583.14 2.496E-01 *(P 3.015E-02 1.56E-02 G
                          510.72 3.514E-01 + P 1.456E-01 6.34E-02 G

PB-212       5.2849E-01
                          238.63 5.285E-01  (P 6.668E-02 2.60E-02 G K
                                                          Energy duplication
                           77.11 3.825E-01 }   2.078E-01 6.08E-02 G
                           74.81 6.658E-01 + P 3.834E-01 1.22E-01 G

PB-214       4.3293E-01
                          351.99 4.236E-01 *(P 6.119E-02 2.80E-02 G K
                          295.22 4.509E-01 *(P 1.468E-01 6.03E-02 G
                                                          Energy duplication
                           77.11 3.597E-01 } P 4.433E-01 1.19E-01 G
                          241.92 5.513E-01 + P 3.855E-01 1.22E-01 G

BI-212       5.8986E-01
                          727.17 5.791E-01 *(P 2.256E-01 9.66E-02 G K
                         1620.56 6.361E-01  (P 6.475E-01 2.52E-01 G
                          785.42 1.085E+00 + P 1.390E+00 4.35E-01 G

BI-214       4.5218E-01
                          609.32 4.464E-01 *(P 7.256E-02 3.73E-02 G K
                         1764.51 5.663E-01 + P 7.747E-02 6.55E-02 G
                         1120.28 4.699E-01 @(P 2.199E-01 9.05E-02 G

RA-224      -2.9378E-01
                          241.00-2.938E-01 &(P 8.723E-01 2.63E-01 G

RA-226       1.1195E+00
                          185.99 1.119E+00 *(  8.354E-01 3.01E-01 G

AC-228       7.5245E-01
                          911.07 7.524E-01 *(P 1.387E-01 7.47E-02 G K
                          968.90 1.077E+00 + P 1.883E-01 9.96E-02 G
                          338.40 5.815E-01 - P 1.977E-01 7.51E-02 G

TH-227      -3.6400E-01
                          236.00-3.640E-01 ?(P 3.801E-01 1.17E-01 G K
                          256.25-6.996E-03 & P 3.021E-01 8.84E-02 G

PA-234      -2.6774E-02
                           98.44-2.677E-02 %(  1.147E-01 3.45E-02 G K
                          946.00 4.242E-03 &   1.652E-01 4.75E-02 G
                          131.28-2.125E-02 &   1.480E-01 4.43E-02 G
                           94.67-9.918E-02 %   2.460E-01 7.44E-02 G
                          883.24 4.858E-02 &   1.890E-01 5.54E-02 G
                          926.70 8.856E-02 %   2.316E-01 6.93E-02 G
```

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 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26-3.527E-02 %   2.432E-01 7.13E-02 G

TH-234       4.7283E-01
                           63.29 4.728E-01 %(P 1.520E+00 4.57E-01 G K
                           92.80 6.365E-01 & P 1.317E+00 3.98E-01 G
                           92.38 8.439E-01 % P 1.565E+00 4.75E-01 G

AM-241       2.4846E-03
                           59.54 2.485E-03 %(P 1.869E-01 5.57E-02 G
   ( - This peak used in the nuclide activity average.

   * - Peak is too wide, but only one peak in library.
   ! - Peak is part of a multiplet and this area went
       negative during deconvolution.
   ? - Peak is too narrow.
   @ - Peak is too wide at FW25M, but ok at FWHM.
   % - Peak fails sensitivity test.
   $ - Peak identified, but first peak of this nuclide
       failed one or more qualification tests.
   + - Peak activity higher than counting uncertainty range.
   - - Peak activity lower than counting uncertainty range.
   = - Peak outside analysis energy range.
   & - Calculated peak centroid is not close enough to the
       library energy centroid for positive identification.
   P - Peakbackground subtraction
   } - Peak is too close to another for the activity
       to be found directly.

   Nuclide Codes:                      Peak Codes:
   T - Thermal Neutron Activation      G - Gamma Ray
   F - Fast Neutron Activation         X - X-Ray
   I - Fission Product                 P - Positron Decay
   N - Naturally Occurring Isotope     S - Single-Escape
   P - Photon Reaction                 D - Double-Escape
   C - Charged Particle Reaction       K - Key Line
   M - No MDA Calculation              A - Not in Average
   R - Coincidence Corrected           C - Coincidence Peak
   H - Halflife limit exceeded

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
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***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	6.8703E-02	7.4374E-02	2.0683E-01	2.0688E-01	2.133E-01
K-40	#	1.4181E+01	1.4181E+01	1.0792E+00	1.3660E+00	
MN-54	#A	-1.0617E-03	-1.0762E-03	4.6775E-02	4.6775E-02	3.224E-02
CO-57	#B	-1.1367E-02	-1.1547E-02	3.4049E-02	3.4055E-02	3.664E-02
CO-60	#B	5.2343E-03	5.2458E-03	2.6321E-02	2.6323E-02	3.086E-02

Sr-85	#A	-1.1802E-02	-1.2599E-02	3.2739E-02	3.2748E-02	3.402E-02
Kr-85	#A	-3.0179E+02	-3.0180E+02	8.6008E+02	8.6027E+02	7.894E+02
Y-88	#B	1.6517E-03	1.7186E-03	1.6888E-02	1.6888E-02	2.058E-02
NB-94	#B	8.0366E-03	8.0366E-03	2.0123E-02	2.0129E-02	2.254E-02
Ag-108M	#B	-1.5971E-02	-1.5972E-02	3.5240E-02	3.5253E-02	3.896E-02
CD-109	#A	7.0194E-01	7.0853E-01	9.8707E-01	9.8785E-01	1.069E+00
SN-113	#B	8.0442E-03	8.3457E-03	3.2763E-02	3.2767E-02	3.553E-02
SB-125	#B	4.7007E-02	4.7204E-02	3.9841E-02	3.9938E-02	8.682E-02
I-131	#B	2.1582E-03	3.6548E-03	3.9775E-02	3.9775E-02	2.669E-02
CS-134	#B	1.8433E-02	1.8537E-02	1.6696E-02	1.6732E-02	2.139E-02
CS-137	#A	1.6841E-02	1.6847E-02	2.9627E-02	2.9644E-02	3.265E-02
CE-139	#A	-9.3258E-03	-9.6176E-03	3.3108E-02	3.3113E-02	3.494E-02
EU-152	#B	-3.4124E-02	-3.4155E-02	9.5205E-02	9.5224E-02	1.045E-01
EU-154	#B	-2.3749E-02	-2.3782E-02	6.9818E-02	6.9830E-02	7.539E-02
EU-155	#B	8.4725E-02	8.4923E-02	1.1946E-01	1.1955E-01	1.303E-01
HG-203	#B	-7.4857E-03	-8.1982E-03	3.6043E-02	3.6046E-02	3.286E-02
TL-208	#	2.4956E-01	2.4956E-01	4.6687E-02	4.8958E-02	
PB-212		5.2849E-01	5.2849E-01	7.8083E-02	8.4091E-02	
PB-214		4.3293E-01	4.3293E-01	8.5709E-02	8.9442E-02	
BI-212		5.8986E-01	5.8986E-01	2.9501E-01	2.9706E-01	
BI-214	#	4.5218E-01	4.5218E-01	1.1334E-01	1.1644E-01	
RA-224	#A	-2.9378E-01	-2.9378E-01	8.6478E-01	8.6496E-01	8.723E-01
RA-226	#	1.1195E+00	1.1195E+00	9.0181E-01	9.0423E-01	
AC-228	#	7.5245E-01	7.5245E-01	2.2399E-01	2.2835E-01	
TH-227	#A	-3.6400E-01	-3.6400E-01	3.5186E-01	3.5252E-01	3.801E-01
PA-234	#B	-2.6774E-02	-2.6774E-02	1.0336E-01	1.0337E-01	1.147E-01
TH-234	#B	4.7283E-01	4.7283E-01	1.3704E+00	1.3706E+00	1.520E+00
AM-241	#A	2.4845E-03	2.4846E-03	1.6696E-01	1.6696E-01	1.869E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (295.2 to 2000.1 keV) 1.8305483E+01 pCi/gm
Total Decayed Activity (295.2 to 2000.1 keV) 1.8305490E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JPK

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 107F_7SEPT2006_1052.An1

Sample description
FSS-OOL-05-03-001-F

Spectrum Filename: C:\GammaVision\Spectra\FSS-OOL-05-03-001-F.An1

Acquisition information

Start time:	07-Sep-2006 10:53:01
Live time:	2000
Real time:	2003
Dead time:	0.13 %
Detector ID:	2

Detector system
Det 107- DSPE- 634

Calibration

Filename:	D7_1LSa.Clb

Detector 107 Calibration for 1 Liter Sand Marinelli

Energy Calibration

Created:	29-Oct-2004 06:48:53
Zero offset:	0.157 keV
Gain:	0.500 keV/channel
Quadratic:	-1.676E-08 keV/channel^2

Efficiency Calibration

Created:	29-Oct-2004 06:51:32
Type:	Polynomial
Uncertainty:	1.174 %
Coefficients:	-0.279532 -4.778179 0.614896
	-0.087174 0.005356 -0.000131

Library Files

Main analysis library:	FSS_Rev_1.Lib
Library Match Width:	1.000
Peak stripping:	Library based

Analysis parameters

Analysis engine:	Env32 G53W4.20
Start channel:	100 (50.16keV)
Stop channel:	4000 (2000.15keV)
Peak rejection level:	41.667%
Peak search sensitivity:	3
Sample Size:	1.2920E+03
Activity scaling factor:	1.0000E+06/(1.0000E+00* 1.2920E+03) = 7.7399E+02
Detection limit method:	Nureg 4.16
Random error:	1.0000000E+00
Systematic error:	1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	01-Sep-2006 07:25:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	107_150K_28APR05.Pbc 01-May-2005 05:30:33
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 15 cutoff 20.00000 %
Energy Calibration
Normalized diff: 1.0000

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
76.05	839.	9.05	3.71	2.909E-02	72.87	6.400	5.459E+00	HG203
					74.81	9.600	3.193E+00	PB212
					77.11	10.700	2.757E+00	PB214
					77.11	17.500	1.696E+00	PB212
87.35	208.	31.42	1.71	3.308E-02	86.45	32.740	2.024E-01	EU155
					88.04	3.790	1.736E+00	CD109
93.42	121.	38.17	1.49	3.451E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
99.14	106.	40.41	0.97	3.557E-02	98.44	25.100	1.245E-01	PA234
128.10	103.	40.19	1.27	3.816E-02				
185.94	170.	26.14	1.33	3.611E-02	185.99	3.280	1.503E+00	RA226
239.10	1464.	4.45	1.99	3.186E-02	238.63	43.100	1.102E+00	PB212
270.15	116.	30.63	1.49	2.945E-02				
295.43	235.	11.29	1.34	2.766E-02	295.22	19.200	4.529E-01	PB214
300.72	60.	35.49	1.34	2.731E-02				
338.36	284.	12.60	1.65	2.501E-02	338.40	12.010	9.769E-01	AC228
351.98	549.	8.40	1.91	2.426E-02				
351.98	549.	8.40	1.91	2.426E-02	351.99	37.100	6.316E-01	PB214
463.34	54.	35.73	1.50	1.953E-02	463.51	10.000	PBC<MDA	SB125
510.71	185.	17.48	2.39	1.808E-02	510.72	22.500	3.886E-01	TL208
583.21	388.	7.08	1.94	1.629E-02	583.14	86.000	2.860E-01	TL208
609.59	359.	8.45	2.23	1.574E-02	609.32	46.090	5.113E-01	BI214
661.83	360.	10.08	2.43	1.477E-02	661.62	84.620	2.988E-01	CS137
718.54	38.	26.57	1.64	1.380E-02	722.95	90.499	3.159E-02	Ag108M
727.60	129.	13.84	2.18	1.374E-02	727.17	11.800	8.263E-01	BI212
795.56	34.	37.92	1.68	1.284E-02	795.76	85.400	PBC<MDA	CS134
911.37	287.	8.34	1.73	1.161E-02	911.07	29.000	8.786E-01	AC228

968.61	182.	14.85	1.98	1.109E-02	968.90	17.460	9.692E-01	AC228
1120.67	101.	23.08	1.52	9.970E-03	1120.28	15.040	7.053E-01	BI214
1461.01	1404.	2.73	2.48	8.190E-03	1460.75	10.700	1.670E+01	K40

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
1764.69	78.	13.57	2.67	7.084E-03	1764.51	15.920	7.244E-01	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
151.77	76.05	2288.	191.	0.096	108.29	3.709	BI-207	s
186.50	93.42	908.	121.	0.060	114.51	1.492	U-235	l
197.95	99.14	750.	106.	0.053	121.22	0.966	AC-228	l
477.83	239.10	1687.	508.	0.254	36.77	1.992	PB-212	s
539.92	270.15	393.	116.	0.058	91.90	1.491	AC-228	s
601.07	300.70	197.	60.	0.030	106.48	1.341	PB-212	lD
703.57	351.98	765.	168.	0.084	73.61	1.907	PB-214	s

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-212	153.36	76.85	1766.	281.	0.140	65.07	1.500s
PB-214	153.89	77.11	1764.	358.	0.179	51.46	1.500D
PB-212	153.89	77.11	1759.	363.	0.182	51.46	1.500D
CD-109	174.35	87.34	1488.	134.	0.067	124.11	1.500s
RA-226	371.53	185.94	670.	170.	0.085	78.41	1.332s
TH-227	471.40	235.88	1209.	-132.	-0.066	115.29	1.500s
PB-212	477.11	238.74	935.	928.	0.464	16.78	1.500s
PB-214	590.41	295.39	410.	232.	0.116	40.97	1.500s
AC-228	676.34	338.36	305.	280.	0.140	37.80	1.652s
PB-214	703.85	352.12	302.	376.	0.188	24.59	1.500s
SB-125	926.27	463.34	178.	54.	0.027	107.18	1.500s
TL-208	1021.02	510.71	266.	151.	0.076	52.45	2.389s
TL-208	1166.01	583.21	119.	383.	0.192	21.25	1.944s
BI-214	1218.76	609.59	160.	355.	0.177	25.35	2.234s
CS-137	1323.24	661.83	217.	357.	0.178	30.25	2.429s
Ag-108M	1436.64	718.54	31.	38.	0.019	79.71	1.635s
BI-212	1454.78	727.60	75.	128.	0.064	41.52	2.178s
CS-134	1590.69	795.56	68.	34.	0.017	113.75	1.684s
AC-228	1822.30	911.37	88.	283.	0.141	25.01	1.728s
AC-228	1936.79	968.61	136.	179.	0.090	44.56	1.977s
BI-214	2240.90	1120.67	117.	101.	0.051	69.25	1.523s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
K-40	2921.61	1461.01	19.	1399.	0.700	8.18	2.477s
BI-214	3529.02	1764.69	10.	78.	0.039	40.72	2.673s

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	MDA Value pCi/gm	COMMENTS
BE-7		9.8673E-02					
			477.56	9.867E-02	&(	3.298E-01	9.83E-02 G
K-40		1.6699E+01					
			1460.75	1.670E+01	*(P	2.730E-01	4.57E-01 G
MN-54		1.1389E-02					
			834.81	1.139E-02	%(P	3.308E-02	9.83E-03 G
CO-57		-1.1796E-02					
			122.07	-1.180E-02	%(P	4.868E-02	1.46E-02 G K
			136.43	-1.205E-01	% P	3.729E-01	1.12E-01 G
CO-60		6.0798E-03					
			1332.51	6.080E-03	%(P	3.983E-02	1.12E-02 G K
			1173.23	-4.531E-03	% P	6.106E-02	1.74E-02 G K
Sr-85		-2.1829E-02					
			514.00	-2.183E-02	&(	5.194E-02	1.57E-02 G
Kr-85		-5.1237E+02					
			513.99	-5.124E+02	&(P	1.128E+03	3.39E+02 G
Y-88		-5.8262E-03					
			1836.01	-5.826E-03	%(P	3.298E-02	8.87E-03 G K
			898.02	-1.230E-02	% P	4.967E-02	1.45E-02 G
NB-94		1.2769E-02					
			871.10	1.277E-02	%(P	3.247E-02	9.72E-03 G K
			702.50	1.280E-02	% P	4.071E-02	1.21E-02 G K
Ag-108M		3.1588E-02					
			722.95	3.159E-02	?(	2.412E-02	8.39E-03 G K
			614.37	-1.950E-02	%	5.291E-02	1.59E-02 G
			433.93	-4.622E-03	& P	3.116E-02	9.05E-03 G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CD-109	1.1262E+00						
		88.04	1.126E+00	*(P	1.528E+00	4.67E-01	G
SN-113	-6.3320E-03						
		391.71	-6.332E-03	&(P	5.394E-02	1.58E-02	G K
		255.04	3.662E-01	%	1.663E+00	4.97E-01	G
SB-125	8.4339E-02						
		427.95	1.524E-02	&(P	1.124E-01	3.30E-02	G K
		600.77	2.188E-02	% P	1.668E-01	4.83E-02	G
		636.15	-9.363E-03	& P	2.701E-01	7.68E-02	G
		463.51	2.889E-01	*(P	3.494E-01	1.09E-01	G
		176.29	-1.175E-02	& P	5.154E-01	1.52E-01	G
I-131	9.0311E-04						
		364.48	9.031E-04	&(	6.129E-02	1.79E-02	G K
		636.97	-9.801E-02	%	8.460E-01	2.47E-01	G
		284.29	-7.217E-02	%	9.169E-01	2.71E-01	G
CS-134	-2.7466E-02						
		604.66	-2.747E-02	%(P	5.023E-02	1.53E-02	G K
		795.76	3.235E-02	+ P	3.940E-02	1.25E-02	G
		569.29	-4.566E-02	&	2.421E-01	7.14E-02	G
		801.84	-1.158E-01	% P	4.337E-01	1.28E-01	G
CS-137	2.9882E-01						
		661.62	2.988E-01	*(P	5.974E-02	3.04E-02	G
CE-139	7.6087E-03						
		165.85	7.609E-03	%(P	4.439E-02	1.33E-02	G
EU-152	-3.0955E-02						
		121.78	-3.096E-02	%(P	1.393E-01	4.19E-02	G K
		344.30	-5.580E-02	& P	1.199E-01	3.62E-02	G
		1408.08	-4.917E-03	% P	1.772E-01	4.85E-02	G
		964.00	-1.303E-01	& P	4.105E-01	1.23E-01	G
		1112.07	-3.451E-03	% P	3.274E-01	9.27E-02	G
		778.90	-5.553E-03	% P	2.681E-01	7.61E-02	G
EU-154	1.3695E-02						
		123.10	1.369E-02	%(P	8.070E-02	2.41E-02	G K
		1274.80	-3.480E-02	% P	1.422E-01	4.17E-02	G
		723.30	-1.544E-01	% P	2.780E-01	8.47E-02	G
		1004.80	-4.563E-02	% P	2.222E-01	6.47E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
EU-155	1.1406E-01						
		86.45	1.141E-01	%(	1.876E-01	5.71E-02	G K
		105.31	3.568E-02	& P	1.956E-01	5.87E-02	G
HG-203	-2.7119E-03						
		279.17	-2.712E-03	&(P	4.349E-02	1.28E-02	G K
		72.87	-4.526E-01	% P	1.391E+00	4.20E-01	G
		70.83	-1.320E-02	&	2.748E+00	8.24E-01	G
		82.50	-8.527E-01	%	3.029E+00	9.14E-01	G
TL-208	2.8599E-01						
		583.14	2.860E-01	*(P	3.997E-02	2.05E-02	G
		510.72	3.886E-01	+ P	2.023E-01	8.31E-02	G
PB-212	7.1389E-01						
		238.63	7.057E-01	*(P	1.105E-01	4.01E-02	G K
							Energy duplication
		77.11	7.340E-01	*(	4.005E-01	1.26E-01	G
		74.81	1.073E+00	& P	7.591E-01	2.36E-01	G
PB-214	4.4368E-01						
		351.99	4.365E-01	*(P	9.719E-02	3.63E-02	G K
		295.22	4.576E-01	*(P	1.911E-01	6.37E-02	G
							Energy duplication
		77.11	1.185E+00	+ P	6.559E-01	2.06E-01	G
		241.92	-3.233E-01	% P	7.884E-01	2.38E-01	G
BI-212	8.2631E-01						
		727.17	8.263E-01	*(P	2.776E-01	1.16E-01	G K
		1620.56	3.804E-02	& P	1.125E+00	3.01E-01	G
		785.42	9.589E-01	% P	1.830E+00	5.56E-01	G
BI-214	5.1129E-01						
		609.32	5.113E-01	*(P	8.897E-02	4.38E-02	G K
		1764.51	7.244E-01	+ P	1.611E-01	9.95E-02	G
		1120.28	7.053E-01	+ P	3.703E-01	1.64E-01	G
RA-224	8.8365E-02						
		241.00	8.837E-02	%(P	1.313E+00	3.92E-01	G
RA-226	1.5034E+00						
		185.99	1.503E+00	*(	1.089E+00	3.93E-01	G
AC-228	9.2583E-01						
		911.07	8.786E-01	*(P	1.444E-01	7.44E-02	G K
		968.90	9.692E-01	*(P	3.076E-01	1.46E-01	G
		338.40	9.769E-01	*(P	2.927E-01	1.25E-01	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments

TH-227      -3.8291E-01
                          236.00-3.829E-01 ?(P 4.792E-01 1.47E-01 G K
                          256.25-6.511E-02 % P 4.638E-01 1.37E-01 G

PA-234       1.0999E-01
                           98.44 1.100E-01 %(  1.821E-01 5.55E-02 G K
                          946.00-5.760E-02 %   2.330E-01 6.89E-02 G
                          131.28-3.337E-02 %   1.880E-01 5.63E-02 G
                           94.67-1.968E-01 %   3.372E-01 1.03E-01 G
                          883.24 1.490E-01 %   2.602E-01 8.01E-02 G
                          926.70 7.336E-02 %   3.057E-01 8.94E-02 G
                          569.26-6.738E-02 &   3.571E-01 1.05E-01 G

TH-234       7.6205E-01
                           63.29 7.621E-01 %(P 2.395E+00 7.21E-01 G K
                           92.80 1.034E+00 % P 1.826E+00 5.53E-01 G
                           92.38-1.902E-01 % P 2.212E+00 6.61E-01 G

AM-241       2.6959E-03
                           59.54 2.696E-03 %(P 3.325E-01 9.94E-02 G
   ( - This peak used in the nuclide activity average.

   * - Peak is too wide, but only one peak in library.
   ! - Peak is part of a multiplet and this area went
       negative during deconvolution.
   ? - Peak is too narrow.
   @ - Peak is too wide at FW25M, but ok at FWHM.
   % - Peak fails sensitivity test.
   $ - Peak identified, but first peak of this nuclide
       failed one or more qualification tests.
   + - Peak activity higher than counting uncertainty range.
   - - Peak activity lower than counting uncertainty range.
   = - Peak outside analysis energy range.
   & - Calculated peak centroid is not close enough to the
       library energy centroid for positive identification.
   P - Peakbackground subtraction
   } - Peak is too close to another for the activity
       to be found directly.

   Nuclide Codes:                      Peak Codes:
   T - Thermal Neutron Activation      G - Gamma Ray
   F - Fast Neutron Activation         X - X-Ray
   I - Fission Product                 P - Positron Decay
   N - Naturally Occurring Isotope     S - Single-Escape
   P - Photon Reaction                 D - Double-Escape
   C - Charged Particle Reaction       K - Key Line
   M - No MDA Calculation              A - Not in Average
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R - Coincidence Corrected C - Coincidence Peak
H - Halflife limit exceeded

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***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	9.1109E-02	9.8673E-02	2.9485E-01	2.9491E-01	3.045E-01
K-40	#	1.6699E+01	1.6699E+01	1.3713E+00	1.6891E+00	
MN-54	#A	1.1234E-02	1.1389E-02	2.9479E-02	2.9486E-02	3.263E-02
CO-57	#B	-1.1612E-02	-1.1796E-02	4.4581E-02	4.4586E-02	4.792E-02
CO-60	#B	6.0663E-03	6.0798E-03	3.3570E-02	3.3572E-02	3.974E-02
Sr-85	#A	-2.0441E-02	-2.1829E-02	4.7073E-02	4.7090E-02	4.864E-02
Kr-85	#A	-5.1235E+02	-5.1237E+02	1.1921E+03	1.1925E+03	1.128E+03
Y-88	#B	-5.5981E-03	-5.8262E-03	4.1880E-02	4.1882E-02	3.169E-02
NB-94	#B	1.2769E-02	1.2769E-02	2.9164E-02	2.9174E-02	3.247E-02
Ag-108M	#	3.1585E-02	3.1588E-02	2.5178E-02	2.5247E-02	2.412E-02
CD-109	#A	1.1156E+00	1.1262E+00	1.4010E+00	1.4024E+00	1.514E+00
SN-113	#B	-6.1019E-03	-6.3320E-03	7.3680E-02	7.3681E-02	5.198E-02
SB-125	#B	8.3985E-02	8.4339E-02	9.5133E-02	9.5263E-02	1.119E-01
I-131	#B	5.3172E-04	9.0311E-04	5.3586E-02	5.3586E-02	3.609E-02
CS-134	#B	-2.7311E-02	-2.7466E-02	4.7060E-02	4.7088E-02	4.995E-02
CS-137	#	2.9871E-01	2.9882E-01	9.1285E-02	9.2976E-02	
CE-139	#A	7.3766E-03	7.6087E-03	3.9832E-02	3.9835E-02	4.304E-02
EU-152	#B	-3.0927E-02	-3.0955E-02	1.2663E-01	1.2664E-01	1.392E-01
EU-154	#B	1.3676E-02	1.3695E-02	7.2356E-02	7.2360E-02	8.059E-02
EU-155	#B	1.1380E-01	1.1406E-01	1.7130E-01	1.7141E-01	1.871E-01
HG-203	#B	-2.4750E-03	-2.7119E-03	6.1824E-02	6.1824E-02	3.969E-02
TL-208	#	2.8599E-01	2.8599E-01	6.1490E-02	6.3767E-02	
PB-212	#	7.1389E-01	7.1389E-01	1.2179E-01	1.2888E-01	1.105E-01
PB-214	#	4.4368E-01	4.4368E-01	1.0791E-01	1.1104E-01	9.719E-02
BI-212	#	8.2631E-01	8.2631E-01	3.4655E-01	3.4997E-01	
BI-214	#	5.1129E-01	5.1129E-01	1.3122E-01	1.3465E-01	
RA-224	#A	8.8365E-02	8.8365E-02	1.1768E+00	1.1768E+00	1.313E+00
RA-226	#	1.5034E+00	1.5034E+00	1.1787E+00	1.1821E+00	
AC-228	#	9.2583E-01	9.2583E-01	1.9861E-01	2.0600E-01	
TH-227	#A	-3.8291E-01	-3.8291E-01	4.4236E-01	4.4294E-01	4.792E-01
PA-234	#B	1.0999E-01	1.0999E-01	1.6644E-01	1.6655E-01	1.821E-01
TH-234	#B	7.6205E-01	7.6205E-01	2.1633E+00	2.1637E+00	2.395E+00
AM-241	#A	2.6958E-03	2.6959E-03	2.9829E-01	2.9829E-01	3.325E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.

H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (50.2 to 2000.1 keV) 2.1050430E+01 pCi/gm
Total Decayed Activity (50.2 to 2000.1 keV) 2.1050558E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JPK

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 107F_7SEPT2006_1149.An1

Sample description
FSS-OOL-05-03-014-F

Spectrum Filename: C:\GammaVision\Spectra\107F_7SEPT2006_1149.An1

Acquisition information
Start time: 07-Sep-2006 11:49:29
Live time: 2000
Real time: 2003
Dead time: 0.14 %
Detector ID: 2

Detector system
Det 107- DSPE- 634

Calibration
Filename: D7_1LSa.Clb
Detector 107 Calibration for 1 Liter Sand Marinelli

Energy Calibration
Created: 29-Oct-2004 06:48:53
Zero offset: 0.157 keV
Gain: 0.500 keV/channel
Quadratic: -1.676E-08 keV/channel^2

Efficiency Calibration
Created: 29-Oct-2004 06:51:32
Type: Polynomial
Uncertainty: 1.174 %
Coefficients: -0.279532 -4.778179 0.614896
-0.087174 0.005356 -0.000131

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.16keV)
Stop channel: 4000 (2000.15keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 1.3270E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.3270E+03) =
7.5358E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	01-Sep-2006 08:30:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	107_150K_28APR05.Pbc 01-May-2005 05:30:33
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 20 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.3213

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
74.85	378.	12.06	1.18	2.849E-02	74.81	9.600	1.406E+00	PB212
77.15	255.	15.28	1.18	2.957E-02	77.11	17.500	9.318E-01	PB212
					77.11	10.700	1.509E+00	PB214
77.24	134.	39.19	1.50	2.957E-02	77.11	17.500	PBC<MDA	PB212
					77.11	10.700	PBC<MDA	PB214
93.61	139.	31.31	1.33	3.455E-02	92.80	3.000	PBC<MDA	TH234
98.81	125.	30.03	1.34	3.552E-02				
185.88	271.	16.74	2.15	3.611E-02	185.99	3.280	2.334E+00	RA226
238.99	2004.	3.69	2.25	3.187E-02	238.63	43.100	1.473E+00	PB212
					241.00	3.900	1.649E+01	RA224
242.02	181.	22.19	1.30	3.163E-02	241.00	3.900	PBC<MDA	RA224
					241.92	7.470	7.815E-01	PB214
295.06	240.	14.07	2.15	2.769E-02	295.22	19.200	4.513E-01	PB214
328.16	121.	24.81	2.19	2.559E-02				
338.57	315.	10.20	2.40	2.499E-02	338.40	12.010	1.057E+00	AC228
352.13	484.	9.43	2.32	2.425E-02	351.99	37.100	5.423E-01	PB214
462.69	134.	25.91	1.44	1.955E-02				
462.69	134.	25.91	1.44	1.955E-02	463.51	10.000	6.881E-01	SB125
511.03	232.	13.53	1.66	1.807E-02	510.72	22.500	4.970E-01	TL208
583.41	544.	6.40	2.18	1.628E-02	583.14	86.000	3.923E-01	TL208
609.50	379.	7.54	2.40	1.574E-02	609.32	46.090	5.259E-01	BI214
662.04	270.	10.37	2.51	1.476E-02	661.62	84.620	2.176E-01	CS137
727.45	137.	15.47	2.13	1.374E-02	727.17	11.800	8.522E-01	BI212
785.48	36.	36.91	1.68	1.297E-02	785.42	2.000	PBC<MDA	BI212
794.20	36.	39.90	1.68	1.284E-02	795.76	85.400	PBC<MDA	CS134
911.21	448.	6.87	2.95	1.161E-02	911.07	29.000	1.341E+00	AC228
968.29	283.	10.58	2.31	1.110E-02	964.00	14.580	1.775E+00	EU152

					968.90	17.460	1.475E+00	AC228
1120.16	123.	17.51	2.89	9.970E-03	1120.28	15.040	8.348E-01	BI214

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
1461.02	1648.	2.52	2.84	8.190E-03	1460.75	10.700	1.910E+01	K40
1621.50	50.	14.00	1.64	7.569E-03	1620.56	2.750	2.471E+00	BI212
1765.01	87.	11.93	2.31	7.084E-03	1764.51	15.920	7.812E-01	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
655.94	328.16	289.	121.	0.060	74.43	2.193	AC-228	s

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-212	149.29	74.81	871.	378.	0.189	36.17	1.178D
PB-212	153.89	77.11	979.	255.	0.128	45.84	1.179A
PB-214	153.89	77.11	1603.	134.	0.067	117.58	1.500A
PA-234	191.03	95.68	882.	-111.	-0.056	117.02	1.500
RA-226	371.40	185.88	690.	271.	0.136	50.22	2.154s
TH-227	470.90	235.63	1662.	-194.	-0.097	92.00	1.500s
PB-212	476.89	238.63	722.	1176.	0.588	12.84	1.297D
PB-214	483.47	241.92	733.	181.	0.091	66.57	1.299D
PB-214	589.75	295.06	365.	235.	0.118	42.20	2.155s
AC-228	676.75	338.57	278.	312.	0.156	30.59	2.396s
PB-214	703.87	352.13	450.	479.	0.240	28.28	2.323s
SB-125	925.23	462.82	175.	81.	0.041	73.88	1.500s
TL-208	1021.65	511.03	232.	199.	0.099	40.60	1.662s
TL-208	1166.41	583.41	201.	540.	0.270	19.20	2.184s
BI-214	1218.58	609.50	150.	375.	0.187	22.63	2.400s
CS-137	1323.66	662.04	151.	267.	0.133	31.11	2.508s
BI-212	1454.46	727.45	105.	136.	0.068	46.40	2.127s
BI-212	1570.52	785.48	78.	36.	0.018	110.74	1.677
CS-134	1587.98	794.20	90.	36.	0.018	119.71	1.684s
AC-228	1821.98	911.21	123.	443.	0.222	20.60	2.951s
AC-228	1936.15	968.29	135.	281.	0.140	31.75	2.312s
BI-214	2239.89	1120.16	97.	123.	0.061	52.54	2.887s
K-40	2921.63	1461.02	26.	1644.	0.822	7.57	2.840s
BI-212	3242.62	1621.50	1.	50.	0.025	42.01	1.641
BI-214	3529.67	1765.01	6.	87.	0.043	35.78	2.307

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	Peak MDA Value pCi/gm	COMMENTS
BE-7		-3.8798E-03					
			477.56	-3.880E-03	&(	3.608E-01 1.05E-01	G
K-40		1.9098E+01					
			1460.75	1.910E+01	*(P	3.093E-01 4.83E-01	G
MN-54		1.8077E-02					
			834.81	1.808E-02	%(P	4.394E-02 1.32E-02	G
CO-57		-4.8943E-03					
			122.07	-4.894E-03	%(P	4.701E-02 1.41E-02	G K
			136.43	1.031E-01	& P	3.621E-01 1.09E-01	G
CO-60		1.8303E-02					
			1332.51	1.830E-02	%(P	3.278E-02 9.85E-03	G K
			1173.23	1.383E-03	& P	4.299E-02 1.20E-02	G K
Sr-85		-2.3452E-02					
			514.00	-2.345E-02	%(	5.190E-02 1.57E-02	G
Kr-85		-5.4639E+02					
			513.99	-5.464E+02	%(P	1.127E+03 3.40E+02	G
Y-88		-2.4087E-03					
			1836.01	-2.409E-03	&(P	3.519E-02 9.29E-03	G K
			898.02	4.435E-03	% P	3.597E-02 1.03E-02	G
NB-94		5.4877E-03					
			871.10	5.488E-03	&(P	3.747E-02 1.09E-02	G K
			702.50	-6.034E-03	% P	3.420E-02 9.96E-03	G K
Ag-108M		-1.9760E-02					
			722.95	-1.976E-02	%(	5.694E-02 1.71E-02	G K
			614.37	-3.682E-02	%	5.626E-02 1.73E-02	G
			433.93	-8.263E-03	% P	3.690E-02 1.09E-02	G
CD-109		5.8246E-01					
			88.04	5.825E-01	%(P	1.482E+00 4.48E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SN-113	-7.9026E-03						
		391.71	-7.903E-03	&(P	5.585E-02	1.64E-02	G K
		255.04	1.188E-01	&	1.615E+00	4.78E-01	G
SB-125	9.4326E-02						
		427.95	-1.768E-02	%(P	1.143E-01	3.36E-02	G K
		600.77	-5.649E-03	% P	2.034E-01	5.86E-02	G
		636.15	-2.419E-02	% P	3.163E-01	9.15E-02	G
		463.51	4.259E-01	(P	3.374E-01	1.09E-01	G
		176.29	1.627E-01	% P	5.804E-01	1.74E-01	G
I-131	0.0000E+00						
		364.48	0.000E+00	%(	7.370E-02	2.16E-02	G K
		636.97	1.077E-01	%	8.586E-01	2.51E-01	G
		284.29	1.528E-01	&	9.697E-01	2.89E-01	G
CS-134	1.2896E-02						
		604.66	-5.464E-03	&(P	8.140E-02	2.42E-02	G K
		795.76	3.388E-02	*(P	4.381E-02	1.37E-02	G
		569.29	-6.580E-02	%	2.512E-01	7.47E-02	G
		801.84	-3.612E-04	% P	4.191E-01	1.20E-01	G
CS-137	2.1759E-01						
		661.62	2.176E-01	*(P	4.889E-02	2.29E-02	G
CE-139	9.6132E-04						
		165.85	9.613E-04	&(P	3.777E-02	1.12E-02	G
EU-152	-1.6096E-02						
		121.78	-1.610E-02	%(P	1.402E-01	4.20E-02	G K
		344.30	1.446E-02	% P	1.320E-01	3.91E-02	G
		1408.08	7.045E-02	% P	1.615E-01	4.84E-02	G
		964.00	-1.221E-01	% P	4.946E-01	1.48E-01	G
		1112.07	6.215E-03	& P	4.339E-01	1.26E-01	G
		778.90	-7.476E-02	% P	2.905E-01	8.55E-02	G
EU-154	-2.7953E-03						
		123.10	-2.795E-03	%(P	9.889E-02	2.95E-02	G K
		1274.80	-3.805E-02	& P	1.544E-01	4.55E-02	G
		723.30	-9.661E-02	% P	2.621E-01	7.87E-02	G
		1004.80	5.524E-02	& P	2.428E-01	7.13E-02	G
EU-155	7.8120E-02						
		86.45	7.812E-02	%(	1.871E-01	5.67E-02	G K
		105.31	6.495E-02	% P	1.988E-01	6.00E-02	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments

HG-203      -2.6480E-02
                          279.17-2.648E-02 &(P 5.160E-02 1.56E-02 G K
                           72.87 1.562E-01 % P 1.220E+00 3.66E-01 G
                           70.83-1.521E+00 %   2.423E+00 7.38E-01 G
                           82.50-1.438E+00 %   2.393E+00 7.29E-01 G

TL-208       3.9228E-01
                          583.14 3.923E-01 *(P 5.004E-02 2.53E-02 G
                          510.72 4.970E-01 + P 1.846E-01 7.87E-02 G

PB-212       8.8892E-01
                          238.63 8.715E-01  (P 9.474E-02 3.78E-02 G K
                                                          Energy duplication
                           77.11 5.022E-01 }   2.923E-01 7.67E-02 G
                           74.81 1.406E+00 + P 5.222E-01 1.71E-01 G

PB-214       5.1127E-01
                          351.99 5.423E-01 *(P 1.149E-01 5.17E-02 G K
                          295.22 4.513E-01 *(P 1.757E-01 6.47E-02 G
                                                          Energy duplication
                           77.11 4.323E-01 } P 6.092E-01 1.69E-01 G
                          241.92 7.815E-01 + P 5.553E-01 1.75E-01 G

BI-212       8.5224E-01
                          727.17 8.522E-01 *(P 3.173E-01 1.33E-01 G K
                         1620.56 2.471E+00 + P 3.606E-01 3.50E-01 G
                          785.42 1.419E+00 + P 1.721E+00 5.42E-01 G

BI-214       5.2587E-01
                          609.32 5.259E-01 *(P 8.400E-02 4.01E-02 G K
                         1764.51 7.812E-01 + P 1.317E-01 9.42E-02 G
                         1120.28 8.348E-01 + P 3.302E-01 1.47E-01 G

RA-224      -7.5858E-02
                          241.00-7.586E-02 %(P 1.564E+00 4.68E-01 G

RA-226       2.3340E+00
                          185.99 2.334E+00 *(  1.076E+00 3.91E-01 G

AC-228       1.3916E+00
                          911.07 1.341E+00 *(P 1.643E-01 9.30E-02 G K
                          968.90 1.475E+00 *(P 2.994E-01 1.57E-01 G
                          338.40 1.057E+00 - P 2.729E-01 1.09E-01 G

TH-227      -5.4833E-01
                          236.00-5.483E-01 ?(P 5.456E-01 1.68E-01 G K
                          256.25-7.062E-02 % P 5.402E-01 1.60E-01 G
```

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments

PA-234      -1.2702E-01
                           98.44-1.270E-01  (  1.615E-01 4.95E-02 G K
                          946.00-6.006E-02 %   1.933E-01 5.74E-02 G
                          131.28 5.836E-02 &   1.858E-01 5.60E-02 G
                           94.67-1.364E-01 %   2.862E-01 8.68E-02 G
                          883.24 9.717E-02 %   1.879E-01 5.75E-02 G
                          926.70-7.808E-02 %   3.720E-01 1.09E-01 G
                          569.26-9.832E-02 %   3.707E-01 1.10E-01 G

TH-234       6.5574E-01
                           63.29 6.557E-01 %(P 2.263E+00 6.80E-01 G K
                           92.80 1.268E+00 % P 1.797E+00 5.47E-01 G
                           92.38-3.433E-01 & P 1.837E+00 5.49E-01 G

AM-241      -2.3227E-03
                           59.54-2.323E-03 %(P 2.938E-01 8.77E-02 G
   ( - This peak used in the nuclide activity average.

   * - Peak is too wide, but only one peak in library.
   ! - Peak is part of a multiplet and this area went
       negative during deconvolution.
   ? - Peak is too narrow.
   @ - Peak is too wide at FW25M, but ok at FWHM.
   % - Peak fails sensitivity test.
   $ - Peak identified, but first peak of this nuclide
       failed one or more qualification tests.
   + - Peak activity higher than counting uncertainty range.
   - - Peak activity lower than counting uncertainty range.
   = - Peak outside analysis energy range.
   & - Calculated peak centroid is not close enough to the
       library energy centroid for positive identification.
   P - Peakbackground subtraction
   } - Peak is too close to another for the activity
       to be found directly.

   Nuclide Codes:                      Peak Codes:
   T - Thermal Neutron Activation      G - Gamma Ray
   F - Fast Neutron Activation         X - X-Ray
   I - Fission Product                 P - Positron Decay
   N - Naturally Occurring Isotope     S - Single-Escape
   P - Photon Reaction                 D - Double-Escape
   C - Charged Particle Reaction       K - Key Line
   M - No MDA Calculation              A - Not in Average
   R - Coincidence Corrected           C - Coincidence Peak
   H - Halflife limit exceeded

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
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***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	-3.5827E-03	-3.8798E-03	3.1492E-01	3.1492E-01	3.331E-01
K-40	#	1.9098E+01	1.9098E+01	1.4491E+00	1.8364E+00	
MN-54	#A	1.7833E-02	1.8077E-02	3.9661E-02	3.9675E-02	4.334E-02
CO-57	#B	-4.8177E-03	-4.8943E-03	4.3711E-02	4.3712E-02	4.627E-02
CO-60	#B	1.8262E-02	1.8303E-02	2.9556E-02	2.9576E-02	3.271E-02
Sr-85	#A	-2.1962E-02	-2.3452E-02	4.7130E-02	4.7150E-02	4.860E-02
Kr-85	#A	-5.4637E+02	-5.4639E+02	1.1773E+03	1.1777E+03	1.127E+03
Y-88	#B	-2.3144E-03	-2.4087E-03	8.9388E-02	8.9388E-02	3.382E-02
NB-94	#B	5.4877E-03	5.4877E-03	3.2651E-02	3.2653E-02	3.747E-02
Ag-108M	#B	-1.9758E-02	-1.9760E-02	5.1265E-02	5.1278E-02	5.694E-02
CD-109	#A	5.7701E-01	5.8246E-01	1.3451E+00	1.3455E+00	1.468E+00
SN-113	#B	-7.6158E-03	-7.9026E-03	6.9382E-02	6.9384E-02	5.382E-02
SB-125	#B	9.3930E-02	9.4326E-02	7.2100E-02	7.2315E-02	1.138E-01
I-131	#B	0.0000E+00	0.0000E+00	6.4876E-02	6.4876E-02	4.341E-02
CS-134	#B	1.2823E-02	1.2896E-02	1.5663E-02	1.5682E-02	8.094E-02
CS-137	#	2.1750E-01	2.1759E-01	6.8583E-02	6.9777E-02	
CE-139	#A	9.3202E-04	9.6132E-04	3.3557E-02	3.3557E-02	3.661E-02
EU-152	#B	-1.6081E-02	-1.6096E-02	1.2793E-01	1.2793E-01	1.401E-01
EU-154	#B	-2.7915E-03	-2.7953E-03	1.1450E-01	1.1450E-01	9.875E-02
EU-155	#B	7.7936E-02	7.8120E-02	1.6999E-01	1.7004E-01	1.867E-01
HG-203	#B	-2.4168E-02	-2.6480E-02	4.9173E-02	4.9198E-02	4.709E-02
TL-208	#	3.9228E-01	3.9228E-01	7.5961E-02	7.9415E-02	
PB-212		8.8892E-01	8.8892E-01	1.1567E-01	1.2703E-01	
PB-214		5.1127E-01	5.1127E-01	1.3203E-01	1.3544E-01	
BI-212		8.5224E-01	8.5224E-01	3.9920E-01	4.0236E-01	
BI-214		5.2587E-01	5.2587E-01	1.2036E-01	1.2430E-01	
RA-224	#A	-7.5858E-02	-7.5858E-02	2.3029E+00	2.3029E+00	1.564E+00
RA-226	#	2.3340E+00	2.3340E+00	1.1722E+00	1.1803E+00	
AC-228	#	1.3916E+00	1.3916E+00	2.6555E-01	2.7798E-01	
TH-227	#A	-5.4833E-01	-5.4833E-01	5.0519E-01	5.0622E-01	5.456E-01
PA-234	#A	-1.2702E-01	-1.2702E-01	1.4864E-01	1.4881E-01	1.615E-01
TH-234	#B	6.5574E-01	6.5574E-01	2.0414E+00	2.0417E+00	2.263E+00
AM-241	#A	-2.3226E-03	-2.3227E-03	7.5043E-01	7.5043E-01	2.938E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (278.7 to 2000.1 keV) 2.6211948E+01 pCi/gm
Total Decayed Activity (278.7 to 2000.1 keV) 2.6212049E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JPK

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 101f_22aug2006_0922.An1

Sample description
FSS-OOL-05-04-070-F

Spectrum Filename: C:\GammaVision\Spectra\101f_22aug2006_0922.An1

Acquisition information

Start time:	22-Aug-2006 09:23:01
Live time:	2000
Real time:	2002
Dead time:	0.09 %
Detector ID:	1

Detector system
Det 101- DSPE-633

Calibration

Filename:	D1_1LSa.Clb

Detector 101 1.0 Liter Marinelli Sand

Energy Calibration

Created:	03-Sep-2004 08:50:48
Zero offset:	0.244 keV
Gain:	0.500 keV/channel
Quadratic:	-2.493E-08 keV/channel^2

Efficiency Calibration

Created:	03-Sep-2004 08:52:26
Type:	Polynomial
Uncertainty:	0.626 %
Coefficients:	-0.321775 -5.816463 0.734234
	-0.099357 0.006049 -0.000149

Library Files

Main analysis library:	FSS_Rev_1.Lib
Library Match Width:	1.000
Peak stripping:	Library based

Analysis parameters

Analysis engine:	Env32 G53W4.20
Start channel:	100 (50.23keV)
Stop channel:	4000 (1999.11keV)
Peak rejection level:	41.667%
Peak search sensitivity:	3
Sample Size:	1.8740E+03
Activity scaling factor:	1.0000E+06/(1.0000E+00* 1.8740E+03) = 5.3362E+02
Detection limit method:	Nureg 4.16
Random error:	1.0000000E+00
Systematic error:	1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	19-Aug-2006 13:13:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	101_150K_28APR05.Pbc 01-May-2005 05:24:47
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 16 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.1171

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
74.75	212.	13.84	1.00	1.654E-02	74.81	9.600	9.649E-01	PB212
77.05	196.	14.83	1.01	1.720E-02	77.11	17.500	7.316E-01	PB212
					77.11	10.700	1.182E+00	PB214
77.11	99.	35.74	1.50	1.720E-02	77.11	17.500	PBC<MDA	PB212
					77.11	10.700	PBC<MDA	PB214
87.07	108.	38.87	1.50	1.910E-02	86.45	32.740	PBC<MDA	EU155
					88.04	3.790	PBC<MDA	CD109
92.92	131.	28.73	1.50	1.985E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
92.95	112.	34.19	1.50	1.989E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
186.40	70.	34.80	1.79	1.856E-02	185.99	3.280	8.305E-01	RA226
238.72	554.	5.21	1.12	1.557E-02	238.63	43.100	5.888E-01	PB212
241.70	94.	22.56	1.12	1.541E-02	241.00	3.900	PBC<MDA	RA224
					241.92	7.470	5.838E-01	PB214
270.28	48.	36.44	1.57	1.400E-02				
295.15	145.	14.32	1.11	1.292E-02	295.22	19.200	4.169E-01	PB214
300.11	48.	36.00	0.86	1.272E-02				
338.43	141.	16.89	1.18	1.135E-02	338.40	12.010	7.328E-01	AC228
351.92	289.	9.40	1.11	1.093E-02	351.99	37.100	5.108E-01	PB214
463.01	33.	31.05	1.04	8.350E-03				
463.01	33.	31.05	1.04	8.350E-03	463.51	10.000	PBC<MDA	SB125
510.57	130.	14.67	1.27	7.593E-03	510.72	22.500	4.833E-01	TL208
582.94	203.	10.62	1.60	6.687E-03	583.14	86.000	2.519E-01	TL208
609.19	165.	10.88	1.24	6.414E-03	609.32	46.090	3.989E-01	BI214
726.95	48.	22.94	1.18	5.444E-03				
726.95	48.	22.94	1.18	5.444E-03	727.17	11.800	5.257E-01	BI212

768.62	33.	39.59	1.32	5.176E-03				
795.06	23.	40.57	1.50	5.016E-03	795.76	85.400	PBC<MDA	CS134
910.92	126.	13.61	0.98	4.447E-03	911.07	29.000	6.942E-01	AC228
964.40	41.	20.93	1.61	4.230E-03	964.00	14.580	PBC<MDA	EU152

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
969.01	67.	15.07	1.62	4.212E-03	968.90	17.460	6.475E-01	AC228
1119.31	54.	27.59	1.71	3.711E-03	1120.28	15.040	6.928E-01	BI214
1460.42	574.	4.33	1.42	2.943E-03	1460.75	10.700	1.310E+01	K40
1764.21	29.	18.57	1.19	2.481E-03	1764.51	15.920	5.214E-01	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
540.28	270.28	129.	48.	0.024	109.33	1.567	AC-228	s
599.97	300.11	120.	48.	0.024	108.01	0.856	PB-212	s
1537.45	768.62	51.	33.	0.016	118.77	1.320	BI-214	s
1929.19	964.27	17.	41.	0.021	62.90	1.613	EU-152	D

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
HG-203	145.10	72.77	996.	-115.	-0.058	119.32	1.499s
PB-212	149.19	74.81	351.	212.	0.106	41.53	1.005D
PB-212	153.79	77.11	374.	196.	0.098	44.49	1.006A
PB-214	153.79	77.11	683.	99.	0.050	107.23	1.499A
EU-155	173.72	87.07	823.	108.	0.054	116.61	1.499
TH-234	185.41	92.92	766.	131.	0.065	86.18	1.499s
TH-234	185.49	92.95	762.	112.	0.056	102.57	1.499s
RA-226	371.98	186.16	394.	75.	0.037	117.62	1.499s
PB-212	476.96	238.63	146.	548.	0.274	15.63	1.122D
RA-224	482.51	241.41	421.	77.	0.039	116.38	1.499s
PB-214	483.54	241.92	145.	77.	0.038	73.92	1.124D
PB-214	590.05	295.15	127.	143.	0.072	42.96	1.107s
AC-228	676.65	338.43	148.	139.	0.069	50.68	1.175
PB-214	703.63	351.92	147.	287.	0.144	28.20	1.111s
SB-125	925.69	462.90	45.	34.	0.017	94.18	1.499
TL-208	1021.07	510.57	84.	114.	0.057	44.02	1.266s
TL-208	1165.90	582.94	75.	201.	0.100	31.85	1.602s
BI-214	1218.41	609.19	52.	163.	0.082	32.65	1.236
BI-212	1454.24	727.04	33.	39.	0.020	76.92	1.499s
CS-134	1590.34	795.06	32.	23.	0.011	121.72	1.502
AC-228	1822.18	910.92	44.	124.	0.062	40.82	0.976s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
AC-228	1938.21	968.90	18.	66.	0.033	45.23	1.616D
BI-214	2239.22	1119.31	42.	54.	0.027	82.78	1.711s
K-40	2921.85	1460.42	14.	572.	0.286	13.00	1.418
BI-214	3529.86	1764.21	0.	29.	0.014	55.71	1.187s

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	Peak MDA Value pCi/gm	COMMENTS
BE-7		2.1665E-01					
			477.56	2.167E-01	&(	2.945E-01 9.31E-02 G	
K-40		1.3104E+01					
			1460.75	1.310E+01	(P	4.597E-01 5.70E-01 G	
MN-54		1.9819E-02					
			834.81	1.982E-02	%(P	4.473E-02 1.35E-02 G	
CO-57		-8.5417E-04					
			122.07	-8.542E-04	&(	4.738E-02 1.41E-02 G K	
			136.43	-1.037E-02	%	3.762E-01 1.12E-01 G	
CO-60		-1.9614E-04					
			1332.51	-1.961E-04	%(P	5.793E-02 1.57E-02 G K	
			1173.23	1.871E-02	% P	5.801E-02 1.71E-02 G K	
Sr-85		-1.2285E-02					
			514.00	-1.229E-02	%(	5.217E-02 1.54E-02 G	
Kr-85		-2.9230E+02					
			513.99	-2.923E+02	%(P	1.172E+03 3.45E+02 G	
Y-88		0.0000E+00					
			1836.01	0.000E+00	%(	5.124E-02 1.30E-02 G K	
			898.02	-2.967E-03	% P	4.121E-02 1.12E-02 G	
NB-94		-1.2931E-03					
			871.10	-1.293E-03	%(P	4.201E-02 1.15E-02 G K	
			702.50	1.458E-04	& P	4.160E-02 1.16E-02 G K	
Ag-108M		-1.6421E-02					
			722.95	-1.642E-02	%(	6.409E-02 1.89E-02 G K	
			614.37	-7.380E-03	& P	4.837E-02 1.40E-02 G	

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
		433.93	-2.907E-04	%	3.718E-02	1.06E-02	G
CD-109	1.0063E-01						
		88.04	1.006E-01	%(P	1.441E+00	4.30E-01	G
SN-113	1.3092E-02						
		391.71	1.309E-02	&(	5.185E-02	1.53E-02	G K
		255.04	6.771E-01	% P	1.595E+00	4.81E-01	G
SB-125	7.3593E-02						
		427.95	-7.119E-04	%(P	1.327E-01	3.80E-02	G K
		600.77	-1.990E-02	& P	2.069E-01	5.86E-02	G
		636.15	3.557E-02	& P	3.498E-01	9.93E-02	G
		463.51	2.935E-01	(P	2.951E-01	9.61E-02	G
		176.29	-6.002E-02	% P	6.354E-01	1.88E-01	G
I-131	7.4981E-03						
		364.48	7.498E-03	%(	5.501E-02	1.61E-02	G K
		636.97	8.751E-02	&	6.335E-01	1.80E-01	G
		284.29	1.649E-01	%	7.578E-01	2.25E-01	G
CS-134	1.6762E-02						
		604.66	-1.930E-03	%(P	1.012E-01	2.98E-02	G K
		795.76	3.812E-02	(P	4.940E-02	1.58E-02	G
		569.29	8.285E-02	& P	2.744E-01	8.11E-02	G
		801.84	-6.122E-02	&	5.313E-01	1.51E-01	G
CS-137	6.9792E-03						
		661.62	6.979E-03	%(P	5.328E-02	1.53E-02	G
CE-139	6.2820E-03						
		165.85	6.282E-03	&(P	4.821E-02	1.43E-02	G
EU-152	2.8104E-03						
		121.78	2.810E-03	&(P	1.397E-01	4.15E-02	G K
		344.30	-2.448E-02	% P	1.308E-01	3.83E-02	G
		1408.08	-1.913E-02	& P	2.136E-01	5.69E-02	G
		964.00	1.714E-01	& P	5.489E-01	1.63E-01	G
		1112.07	-9.766E-02	% P	4.050E-01	1.17E-01	G
		778.90	3.635E-02	% P	3.426E-01	9.70E-02	G
EU-154	-9.3226E-03						
		123.10	-9.323E-03	&(P	9.693E-02	2.88E-02	G K
		1274.80	-2.495E-02	% P	1.801E-01	5.11E-02	G
		723.30	-7.101E-02	% P	2.962E-01	8.69E-02	G
		1004.80	1.171E-02	% P	2.684E-01	7.39E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
EU-155	1.2438E-01						
		86.45	1.244E-01	(	1.575E-01	4.83E-02	G K
		105.31	4.777E-02	%	1.907E-01	5.72E-02	G
HG-203	2.1415E-02						
		279.17	2.141E-02	&(	4.284E-02	1.30E-02	G K
		72.87	-7.977E-01	& P	1.265E+00	3.85E-01	G
		70.83	-1.631E+00	&	2.117E+00	6.49E-01	G
		82.50	-1.552E-01	%	2.837E+00	8.48E-01	G
TL-208	2.5191E-01						
		583.14	2.519E-01	@(P	5.408E-02	2.71E-02	G
		510.72	4.833E-01	+ P	1.913E-01	8.08E-02	G
PB-212	5.8872E-01						
		238.63	5.887E-01	(P	6.339E-02	3.10E-02	G K
							Energy duplication
		77.11	4.702E-01	}	2.222E-01	6.97E-02	G
		74.81	9.649E-01	+ P	4.085E-01	1.37E-01	G
PB-214	5.0610E-01						
		351.99	5.108E-01	@(P	1.053E-01	4.83E-02	G K
		295.22	4.169E-01	- P	1.603E-01	6.04E-02	G
							Energy duplication
		77.11	3.888E-01	} P	4.878E-01	1.39E-01	G
		241.92	4.826E-01	(P	3.687E-01	1.20E-01	G
BI-212	4.4033E-01						
		727.17	4.403E-01	*(P	3.312E-01	1.15E-01	G K
		1620.56	3.143E-01	%	1.421E+00	3.92E-01	G
		785.42	-4.844E-02	% P	2.452E+00	6.86E-01	G
BI-214	4.3034E-01						
		609.32	3.989E-01	(P	8.821E-02	4.37E-02	G K
		1764.51	5.214E-01	(P	1.345E-01	9.83E-02	G
		1120.28	6.928E-01	+ P	4.270E-01	1.92E-01	G
RA-224	9.2626E-01						
		241.00	9.263E-01	(P	1.176E+00	3.63E-01	G
RA-226	8.8671E-01						
		185.99	8.867E-01	(	1.127E+00	3.48E-01	G
AC-228	6.8814E-01						
		911.07	6.942E-01	(P	1.878E-01	9.59E-02	G K
		968.90	6.474E-01	(P	2.203E-01	9.87E-02	G
		338.40	7.328E-01	(P	3.147E-01	1.26E-01	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments

TH-227      -2.3016E-01
                          236.00-2.302E-01 %(P 4.431E-01 1.35E-01 G K
                          256.25-2.733E-02 % P 5.338E-01 1.56E-01 G

PA-234      -3.5227E-02
                           98.44-3.523E-02 &(  1.698E-01 5.09E-02 G K
                          946.00-2.018E-03 %   2.088E-01 5.66E-02 G
                          131.28 9.734E-03 %   1.956E-01 5.81E-02 G
                           94.67-5.632E-02 &   3.037E-01 9.10E-02 G
                          883.24 7.433E-02 %   3.274E-01 9.39E-02 G
                          926.70-1.538E-02 %   4.114E-01 1.14E-01 G
                          569.26 1.270E-01 &   4.047E-01 1.20E-01 G

TH-234       1.1876E+00
                           63.29 6.275E-01 %(P 2.049E+00 6.15E-01 G K
                           92.80 1.352E+00  (P 1.587E+00 4.88E-01 G
                           92.38 1.846E+00  (P 1.861E+00 5.74E-01 G

AM-241       4.8553E-02
                           59.54 4.855E-02 %(P 2.824E-01 8.44E-02 G
   ( - This peak used in the nuclide activity average.

   * - Peak is too wide, but only one peak in library.
   ! - Peak is part of a multiplet and this area went
       negative during deconvolution.
   ? - Peak is too narrow.
   @ - Peak is too wide at FW25M, but ok at FWHM.
   % - Peak fails sensitivity test.
   $ - Peak identified, but first peak of this nuclide
       failed one or more qualification tests.
   + - Peak activity higher than counting uncertainty range.
   - - Peak activity lower than counting uncertainty range.
   = - Peak outside analysis energy range.
   & - Calculated peak centroid is not close enough to the
       library energy centroid for positive identification.
   P - Peakbackground subtraction
   } - Peak is too close to another for the activity
       to be found directly.

   Nuclide Codes:                      Peak Codes:
   T - Thermal Neutron Activation      G - Gamma Ray
   F - Fast Neutron Activation         X - X-Ray
   I - Fission Product                 P - Positron Decay
   N - Naturally Occurring Isotope     S - Single-Escape
   P - Photon Reaction                 D - Double-Escape
   C - Charged Particle Reaction       K - Key Line
   M - No MDA Calculation              A - Not in Average
```

R - Coincidence Corrected C - Coincidence Peak
H - Halflife limit exceeded

- -

***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	2.0881E-01	2.1665E-01	2.7927E-01	2.7953E-01	2.838E-01
K-40		1.3104E+01	1.3104E+01	1.7104E+00	1.8638E+00	
MN-54	#A	1.9695E-02	1.9819E-02	4.0368E-02	4.0383E-02	4.445E-02
CO-57	#B	-8.4797E-04	-8.5417E-04	4.2179E-02	4.2179E-02	4.703E-02
CO-60	#B	-1.9594E-04	-1.9614E-04	8.1596E-03	8.1596E-03	5.787E-02
Sr-85	#A	-1.1918E-02	-1.2285E-02	4.6249E-02	4.6255E-02	5.061E-02
Kr-85	#A	-2.9229E+02	-2.9230E+02	1.2367E+03	1.2368E+03	1.172E+03
Y-88	#B	0.0000E+00	0.0000E+00	3.9025E-02	3.9025E-02	5.030E-02
NB-94	#B	-1.2931E-03	-1.2931E-03	4.7762E-02	4.7762E-02	4.201E-02
Ag-108M	#B	-1.6421E-02	-1.6421E-02	5.6686E-02	5.6694E-02	6.409E-02
CD-109	#A	1.0019E-01	1.0063E-01	1.2907E+00	1.2907E+00	1.435E+00
SN-113	#B	1.2870E-02	1.3092E-02	4.5859E-02	4.5865E-02	5.097E-02
SB-125	#B	7.3450E-02	7.3593E-02	7.2266E-02	7.2386E-02	1.325E-01
I-131	#B	5.8696E-03	7.4981E-03	4.8193E-02	4.8195E-02	4.306E-02
CS-134	#B	1.6718E-02	1.6762E-02	2.0780E-02	2.0801E-02	1.010E-01
CS-137	#A	6.9779E-03	6.9792E-03	4.5782E-02	4.5784E-02	5.327E-02
CE-139	#A	6.1927E-03	6.2820E-03	4.3042E-02	4.3043E-02	4.752E-02
EU-152	#B	2.8092E-03	2.8104E-03	1.2437E-01	1.2437E-01	1.396E-01
EU-154	#B	-9.3167E-03	-9.3226E-03	1.0204E-01	1.0204E-01	9.687E-02
EU-155	#A	1.2425E-01	1.2438E-01	1.4505E-01	1.4521E-01	1.573E-01
HG-203	#B	2.0529E-02	2.1415E-02	3.9039E-02	3.9058E-02	4.106E-02
TL-208	#	2.5191E-01	2.5191E-01	8.1173E-02	8.2412E-02	
PB-212		5.8872E-01	5.8872E-01	9.3060E-02	9.8827E-02	
PB-214		5.0610E-01	5.0610E-01	1.4368E-01	1.4650E-01	
BI-212	#	4.4033E-01	4.4033E-01	3.4457E-01	3.4547E-01	3.312E-01
BI-214		4.3034E-01	4.3034E-01	1.4076E-01	1.4284E-01	
RA-224	#A	9.2626E-01	9.2626E-01	1.0879E+00	1.0892E+00	1.176E+00
RA-226	#A	8.8670E-01	8.8671E-01	1.0429E+00	1.0441E+00	1.127E+00
AC-228		6.8814E-01	6.8814E-01	1.8433E-01	1.8838E-01	
TH-227	#B	-2.3016E-01	-2.3016E-01	4.1002E-01	4.1023E-01	4.431E-01
PA-234	#B	-3.5227E-02	-3.5227E-02	1.5260E-01	1.5261E-01	1.698E-01
TH-234	#B	1.1876E+00	1.1876E+00	1.1085E+00	1.1105E+00	2.049E+00
AM-241	#A	4.8553E-02	4.8553E-02	2.5332E-01	2.5334E-01	2.824E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.

H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (1120.2 to 1999.1 keV) 1.5568832E+01 pCi/gm
Total Decayed Activity (1120.2 to 1999.1 keV) 1.5568832E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JPK

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 101F_22AUG2006_1004.An1

Sample description
FSS-OOL-05-04-082-F

Spectrum Filename: C:\GammaVision\Spectra\101F_22AUG2006_1004.An1

Acquisition information

Start time:	22-Aug-2006 10:04:51
Live time:	2000
Real time:	2001
Dead time:	0.05 %
Detector ID:	1

Detector system
Det 101- DSPE-633

Calibration

Filename:	D1_1LSa.Clb

Detector 101 1.0 Liter Marinelli Sand

Energy Calibration

Created:	03-Sep-2004 08:50:48
Zero offset:	0.244 keV
Gain:	0.500 keV/channel
Quadratic:	-2.493E-08 keV/channel^2

Efficiency Calibration

Created:	03-Sep-2004 08:52:26
Type:	Polynomial
Uncertainty:	0.626 %
Coefficients:	-0.321775 -5.816463 0.734234
	-0.099357 0.006049 -0.000149

Library Files

Main analysis library:	FSS_Rev_1.Lib
Library Match Width:	1.000
Peak stripping:	Library based

Analysis parameters

Analysis engine:	Env32 G53W4.20
Start channel:	100 (50.23keV)
Stop channel:	4000 (1999.11keV)
Peak rejection level:	41.667%
Peak search sensitivity:	3
Sample Size:	9.9000E+02
Activity scaling factor:	1.0000E+06/(1.0000E+00* 9.9000E+02) = 1.0101E+03
Detection limit method:	Nureg 4.16
Random error:	1.0000000E+00
Systematic error:	1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	19-Aug-2006 11:30:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	101_150K_28APR05.Pbc 01-May-2005 05:24:47
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 12 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.0646

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
74.74	94.	22.58	1.00	1.651E-02	72.87	6.400	PBC<MDA	HG203
					74.81	9.600	PBC<MDA	PB212
75.07	66.	41.07	1.50	1.654E-02	72.87	6.400	PBC<MDA	HG203
					74.81	9.600	PBC<MDA	PB212
76.96	122.	23.45	1.50	1.720E-02	77.11	10.700	8.741E-01	PB214
					77.11	17.500	5.513E-01	PB212
77.13	138.	14.84	1.01	1.720E-02	77.11	10.700	1.021E+00	PB214
					77.11	17.500	6.243E-01	PB212
84.22	42.	37.85	1.01	1.868E-02				
93.39	70.	26.06	1.02	1.992E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
186.27	63.	31.39	1.02	1.857E-02	185.99	3.280	1.420E+00	RA226
238.76	338.	6.32	1.12	1.557E-02	238.63	43.100	6.755E-01	PB212
241.84	36.	39.88	1.12	1.541E-02	241.00	3.900	PBC<MDA	RA224
					241.92	7.470	PBC<MDA	PB214
295.26	107.	14.07	1.03	1.292E-02	295.22	19.200	5.790E-01	PB214
338.17	76.	26.85	1.10	1.136E-02				
338.17	76.	26.85	1.10	1.136E-02	338.40	12.010	7.372E-01	AC228
352.07	151.	12.05	0.79	1.092E-02	351.99	37.100	5.019E-01	PB214
462.82	23.	39.09	0.88	8.354E-03				
462.82	23.	39.09	0.88	8.354E-03	463.51	10.000	PBC<MDA	SB125
511.06	64.	18.28	1.59	7.586E-03	510.72	22.500	3.794E-01	TL208
583.08	98.	11.68	1.44	6.685E-03	583.14	86.000	2.261E-01	TL208
609.47	92.	15.92	1.02	6.411E-03	609.32	46.090	4.198E-01	BI214
660.76	35.	24.33	1.15	5.945E-03	661.62	84.620	9.270E-02	CS137
727.16	19.	37.33	1.50	5.443E-03	727.17	11.800	PBC<MDA	BI212
911.11	75.	14.05	1.33	4.446E-03	911.07	29.000	7.742E-01	AC228

1119.68	42.	18.33	2.08	3.711E-03	1120.28	15.040	1.037E+00	BI214
1460.61	271.	6.24	1.89	2.943E-03	1460.75	10.700	1.163E+01	K40

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
1764.35	8.	38.40	2.11	2.481E-03	1764.51	15.920	PBC<MDA	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
149.04	74.72	176.	94.	0.047	67.75	1.005	BI-207	D
168.01	83.90	106.	42.	0.021	113.54	1.012	TA-182	lD
477.21	238.71	60.	338.	0.169	18.97	1.122	PB-212	D

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-214	153.79	77.11	153.	138.	0.069	44.53	1.006D
PB-212	153.79	77.11	346.	122.	0.061	70.34	1.499D
TH-234	185.62	93.02	312.	82.	0.041	85.17	1.499s
TH-234	185.64	93.03	307.	76.	0.038	95.19	1.499s
RA-226	371.96	186.15	170.	55.	0.027	108.52	1.499s
PB-212	477.20	238.75	138.	294.	0.147	23.77	1.499
PB-214	483.54	241.92	59.	33.	0.017	107.50	1.124D
PB-214	590.26	295.26	54.	105.	0.053	42.21	1.028
AC-228	676.36	338.29	84.	64.	0.032	68.36	1.499
PB-214	703.93	352.07	62.	149.	0.075	36.15	0.786
TL-208	1022.05	511.06	45.	47.	0.024	54.84	1.594s
TL-208	1166.17	583.08	18.	95.	0.048	35.04	1.436
BI-214	1218.98	609.47	37.	91.	0.045	47.75	1.021
CS-137	1321.60	660.76	16.	34.	0.017	72.98	1.149s
BI-212	1454.46	727.16	17.	19.	0.009	111.99	1.499
AC-228	1822.69	911.17	18.	60.	0.030	46.83	1.578s
BI-214	2239.95	1119.68	6.	42.	0.021	54.98	2.082s
K-40	2922.24	1460.61	7.	268.	0.134	18.71	1.885
BI-214	3530.13	1764.35	1.	8.	0.004	115.20	2.106s

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	MDA Value pCi/gm	COMMENTS
BE-7		5.7189E-02					
			477.56	5.719E-02	%(	5.108E-01 1.44E-01	G
K-40		1.1633E+01					
			1460.75	1.163E+01	(P	6.397E-01 7.31E-01	G
MN-54		1.2030E-02					
			834.81	1.203E-02	&(P	6.880E-02 1.93E-02	G
CO-57		4.5187E-04					
			122.07	4.519E-04	&(	6.033E-02 1.77E-02	G K
			136.43	6.714E-02	&	4.264E-01 1.26E-01	G
CO-60		2.1282E-02					
			1332.51	2.128E-02	%(P	8.512E-02 2.42E-02	G K
			1173.23	3.008E-02	% P	6.871E-02 2.06E-02	G K
Sr-85		-1.9242E-02					
			514.00	-1.924E-02	%(	7.952E-02 2.34E-02	G
Kr-85		-4.8060E+02					
			513.99	-4.806E+02	%(P	1.792E+03 5.23E+02	G
Y-88		0.0000E+00					
			1836.01	0.000E+00	%(	4.315E-02 5.86E-03	G K
			898.02	-1.490E-02	% P	8.392E-02 2.37E-02	G
NB-94		-1.1543E-02					
			871.10	-1.154E-02	%(P	6.465E-02 1.81E-02	G K
			702.50	-1.037E-03	% P	4.765E-02 1.25E-02	G K
Ag-108M		-2.7350E-02					
			722.95	-2.735E-02	%(	8.794E-02 2.59E-02	G K
			614.37	-1.722E-02	& P	6.758E-02 1.96E-02	G
			433.93	2.777E-03	%	4.429E-02 1.22E-02	G
CD-109		1.5092E-01					
			88.04	1.509E-01	%(P	1.773E+00 5.25E-01	G
SN-113		-2.2936E-02					
			391.71	-2.294E-02	%(	8.707E-02 2.56E-02	G K
			255.04	-5.196E-01	% P	2.294E+00 6.76E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	-3.7025E-02						
		427.95	-3.702E-02	&(P	1.644E-01	4.74E-02	G K
		600.77	-5.935E-02	% P	3.424E-01	9.76E-02	G
		636.15	1.244E-01	& P	4.376E-01	1.26E-01	G
		463.51	3.685E-01	% P	4.949E-01	1.56E-01	G
		176.29	-1.303E-02	% P	7.487E-01	2.17E-01	G
I-131	-2.8567E-03						
		364.48	-2.857E-03	%(	7.483E-02	2.12E-02	G K
		636.97	2.533E-01	&	9.068E-01	2.63E-01	G
		284.29	-9.391E-02	&	1.074E+00	3.11E-01	G
CS-134	-1.3424E-03						
		604.66	-1.342E-03	&(P	1.093E-01	3.13E-02	G K
		795.76	4.763E-02	& P	7.231E-02	2.28E-02	G
		569.29	8.142E-02	% P	3.358E-01	9.65E-02	G
		801.84	0.000E+00	&	1.150E+00	3.23E-01	G
CS-137	9.2704E-02						
		661.62	9.270E-02	@(P	5.783E-02	2.31E-02	G
CE-139	-8.5808E-03						
		165.85	-8.581E-03	%(P	6.076E-02	1.79E-02	G
EU-152	2.9551E-03						
		121.78	2.955E-03	%(P	1.679E-01	4.92E-02	G K
		344.30	-4.458E-02	% P	1.908E-01	5.56E-02	G
		1408.08	1.535E-01	% P	2.482E-01	8.08E-02	G
		964.00	1.717E-01	% P	5.557E-01	1.62E-01	G
		1112.07	-3.314E-02	% P	5.900E-01	1.59E-01	G
		778.90	-5.446E-02	% P	4.221E-01	1.16E-01	G
EU-154	2.7865E-03						
		123.10	2.787E-03	%(P	1.201E-01	3.52E-02	G K
		1274.80	-4.051E-02	% P	2.923E-01	8.20E-02	G
		723.30	-1.280E-01	% P	4.178E-01	1.22E-01	G
		1004.80	-5.614E-02	% P	4.564E-01	1.27E-01	G
EU-155	1.3541E-01						
		86.45	1.354E-01	%(	1.953E-01	6.00E-02	G K
		105.31	-3.063E-02	&	2.042E-01	6.03E-02	G
HG-203	-1.4931E-03						
		279.17	-1.493E-03	&(	5.419E-02	1.54E-02	G K
		72.87	-2.807E-01	% P	1.504E+00	4.48E-01	G
		70.83	-7.712E-01	%	2.628E+00	7.89E-01	G
		82.50	-5.309E-01	&	3.096E+00	9.21E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	2.2611E-01						
		583.14	2.261E-01	(P	5.309E-02	2.71E-02	G
		510.72	3.794E-01	+ P	2.702E-01	9.28E-02	G
PB-212	5.8375E-01						
		238.63	5.969E-01	(P	1.169E-01	4.83E-02	G K
							Energy duplication
		77.11	5.513E-01	@(	4.051E-01	1.29E-01	G
		74.81	5.680E-01	& P	8.231E-01	2.52E-01	G
PB-214	5.2817E-01						
		351.99	5.019E-01	(P	1.327E-01	6.13E-02	G K
		295.22	5.790E-01	(P	2.030E-01	8.28E-02	G
							Energy duplication
		77.11	1.021E+00	+ P	4.479E-01	1.56E-01	G
		241.92	3.972E-01	- P	4.552E-01	1.45E-01	G
BI-212	3.9740E-01						
		727.17	3.974E-01	(P	4.677E-01	1.54E-01	G K
		1620.56	7.002E-03	&	2.495E+00	6.06E-01	G
		785.42	1.092E-01	& P	3.182E+00	8.61E-01	G
BI-214	4.1977E-01						
		609.32	4.198E-01	(P	1.436E-01	6.76E-02	G K
		1764.51	2.694E-01	- P	2.786E-01	1.09E-01	G
		1120.28	1.037E+00	+ P	3.356E-01	1.92E-01	G
RA-224	4.3922E-01						
		241.00	4.392E-01	&(P	1.555E+00	4.64E-01	G
RA-226	1.2301E+00						
		185.99	1.230E+00	*(	1.421E+00	4.45E-01	G
AC-228	6.3940E-01						
		911.07	6.371E-01	*(P	2.366E-01	1.03E-01	G K
		968.90	-1.332E-02	% P	5.394E-01	1.47E-01	G
		338.40	6.449E-01	(P	4.548E-01	1.52E-01	G
TH-227	-2.3783E-01						
		236.00	-2.378E-01	%(P	5.812E-01	1.75E-01	G K
		256.25	2.029E-01	% P	6.377E-01	1.89E-01	G
PA-234	2.0662E-02						
		98.44	2.066E-02	%(	2.127E-01	6.28E-02	G K
		946.00	-2.099E-02	%	3.808E-01	1.04E-01	G
		131.28	-3.090E-02	&	2.382E-01	7.04E-02	G
		94.67	-8.776E-02	%	3.972E-01	1.19E-01	G
		883.24	0.000E+00	&	6.460E-01	1.76E-01	G
		926.70	9.983E-02	&	5.069E-01	1.41E-01	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26 1.288E-01 %   4.930E-01 1.43E-01 G

TH-234       1.2637E+00
                           63.29 2.805E-01 %(P 2.654E+00 7.80E-01 G K
                           92.80 1.745E+00  (P 1.930E+00 5.98E-01 G
                           92.38 2.194E+00  (P 2.275E+00 7.05E-01 G

AM-241       6.9117E-04
                           59.54 6.912E-04 %(P 3.184E-01 9.29E-02 G
   ( - This peak used in the nuclide activity average.

   * - Peak is too wide, but only one peak in library.
   ! - Peak is part of a multiplet and this area went
       negative during deconvolution.
   ? - Peak is too narrow.
   @ - Peak is too wide at FW25M, but ok at FWHM.
   % - Peak fails sensitivity test.
   $ - Peak identified, but first peak of this nuclide
       failed one or more qualification tests.
   + - Peak activity higher than counting uncertainty range.
   - - Peak activity lower than counting uncertainty range.
   = - Peak outside analysis energy range.
   & - Calculated peak centroid is not close enough to the
       library energy centroid for positive identification.
   P - Peakbackground subtraction
   } - Peak is too close to another for the activity
       to be found directly.

   Nuclide Codes:                      Peak Codes:
   T - Thermal Neutron Activation      G - Gamma Ray
   F - Fast Neutron Activation         X - X-Ray
   I - Fission Product                 P - Positron Decay
   N - Naturally Occurring Isotope     S - Single-Escape
   P - Photon Reaction                 D - Double-Escape
   C - Charged Particle Reaction       K - Key Line
   M - No MDA Calculation              A - Not in Average
   R - Coincidence Corrected           C - Coincidence Peak
   H - Halflife limit exceeded

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
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***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	5.5048E-02	5.7189E-02	4.3332E-01	4.3333E-01	4.917E-01
K-40		1.1633E+01	1.1633E+01	2.1945E+00	2.2908E+00	
MN-54	#A	1.1952E-02	1.2030E-02	5.8041E-02	5.8045E-02	6.836E-02
CO-57	#B	4.4848E-04	4.5187E-04	5.3078E-02	5.3078E-02	5.987E-02
CO-60	#B	2.1259E-02	2.1282E-02	7.2701E-02	7.2711E-02	8.503E-02

Sr-85	#A	-1.8646E-02	-1.9242E-02	7.0121E-02	7.0129E-02	7.706E-02
Kr-85	#A	-4.8059E+02	-4.8060E+02	1.9289E+03	1.9291E+03	1.792E+03
Y-88	#B	0.0000E+00	0.0000E+00	1.7566E-02	1.7570E-02	4.234E-02
NB-94	#B	-1.1543E-02	-1.1543E-02	5.8005E-02	5.8008E-02	6.465E-02
Ag-108M	#B	-2.7349E-02	-2.7350E-02	7.7757E-02	7.7773E-02	8.794E-02
CD-109	#A	1.5024E-01	1.5092E-01	1.5757E+00	1.5757E+00	1.765E+00
SN-113	#B	-2.2534E-02	-2.2936E-02	7.6855E-02	7.6866E-02	8.554E-02
SB-125	#B	-3.6950E-02	-3.7025E-02	1.5572E-01	1.5573E-01	1.640E-01
I-131	#B	-2.2169E-03	-2.8567E-03	6.3489E-02	6.3489E-02	5.807E-02
CS-134	#B	-1.3388E-03	-1.3424E-03	1.1613E-01	1.1613E-01	1.090E-01
CS-137	#	9.2686E-02	9.2704E-02	6.9411E-02	6.9609E-02	
CE-139	#A	-8.4546E-03	-8.5808E-03	5.7447E-02	5.7449E-02	5.987E-02
EU-152	#B	2.9538E-03	2.9551E-03	1.4751E-01	1.4751E-01	1.678E-01
EU-154	#B	2.7847E-03	2.7865E-03	1.0549E-01	1.0549E-01	1.200E-01
EU-155	#B	1.3525E-01	1.3541E-01	1.8001E-01	1.8017E-01	1.951E-01
HG-203	#B	-1.4292E-03	-1.4931E-03	4.6347E-02	4.6347E-02	5.187E-02
TL-208		2.2611E-01	2.2611E-01	8.1201E-02	8.2200E-02	
PB-212	#	5.8375E-01	5.8375E-01	1.4164E-01	1.4543E-01	1.169E-01
PB-214		5.2817E-01	5.2817E-01	1.4900E-01	1.5196E-01	
BI-212	#A	3.9740E-01	3.9740E-01	4.6116E-01	4.6171E-01	4.677E-01
BI-214		4.1977E-01	4.1977E-01	2.0287E-01	2.0425E-01	
RA-224	#A	4.3922E-01	4.3922E-01	1.3908E+00	1.3910E+00	1.555E+00
RA-226	#A	1.2301E+00	1.2301E+00	1.3349E+00	1.3367E+00	1.421E+00
AC-228	#	6.3940E-01	6.3940E-01	2.7367E-01	2.7604E-01	2.366E-01
TH-227	#B	-2.3783E-01	-2.3783E-01	5.4050E-01	5.4067E-01	5.812E-01
PA-234	#B	2.0662E-02	2.0662E-02	1.8839E-01	1.8839E-01	2.127E-01
TH-234	#B	1.2637E+00	1.2637E+00	1.2189E+00	1.2209E+00	2.654E+00
AM-241	#A	6.9116E-04	6.9117E-04	2.7884E-01	2.7884E-01	3.184E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (295.1 to 1999.1 keV) 1.2899733E+01 pCi/gm
Total Decayed Activity (295.1 to 1999.1 keV) 1.2899750E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JPK

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 101F_22AUG2006_1049.An1

Sample description
FSS-OOL-05-04-078-F

Spectrum Filename: C:\GammaVision\Spectra\101F_22AUG2006_1049.An1

Acquisition information
Start time: 22-Aug-2006 10:49:52
Live time: 2000
Real time: 2001
Dead time: 0.06 %
Detector ID: 1

Detector system
Det 101- DSPE-633

Calibration
Filename: D1_1LSa.Clb
Detector 101 1.0 Liter Marinelli Sand

Energy Calibration
Created: 03-Sep-2004 08:50:48
Zero offset: 0.244 keV
Gain: 0.500 keV/channel
Quadratic: -2.493E-08 keV/channel^2

Efficiency Calibration
Created: 03-Sep-2004 08:52:26
Type: Polynomial
Uncertainty: 0.626 %
Coefficients: -0.321775 -5.816463 0.734234
-0.099357 0.006049 -0.000149

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.23keV)
Stop channel: 4000 (1999.11keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 1.7920E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.7920E+03) =
5.5804E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	19-Aug-2006 11:15:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	101_150K_28APR05.Pbc 01-May-2005 05:24:47
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 8 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.0836

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
74.74	87.	39.14	1.50	1.654E-02				
74.74	87.	39.14	1.50	1.654E-02	74.81	9.600	PBC<MDA	PB212
77.12	176.	20.22	1.50	1.720E-02	77.11	17.500	4.397E-01	PB212
					77.11	10.700	7.039E-01	PB214
77.12	172.	20.22	1.50	1.720E-02	77.11	17.500	PBC<MDA	PB212
					77.11	10.700	7.039E-01	PB214
84.21	49.	35.93	0.00	1.874E-02				
93.20	101.	31.88	1.37	1.994E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
185.80	96.	27.39	1.31	1.859E-02				
185.80	96.	27.39	1.31	1.859E-02	185.99	3.280	1.182E+00	RA226
209.30	52.	37.85	1.03	1.721E-02				
238.79	414.	6.01	1.12	1.557E-02	238.63	43.100	4.587E-01	PB212
242.02	68.	25.82	1.12	1.540E-02	241.00	3.900	PBC<MDA	RA224
					241.92	7.470	PBC<MDA	PB214
295.33	129.	11.67	1.16	1.292E-02	295.22	19.200	3.871E-01	PB214
338.21	97.	22.27	1.22	1.136E-02				
338.21	97.	22.27	1.22	1.136E-02	338.40	12.010	5.267E-01	AC228
351.62	180.	11.19	1.13	1.094E-02				
351.62	180.	11.19	1.13	1.094E-02	351.99	37.100	3.314E-01	PB214
510.74	73.	21.27	1.52	7.590E-03	510.72	22.500	2.516E-01	TL208
583.21	128.	14.07	1.57	6.684E-03	583.14	86.000	1.651E-01	TL208
609.36	150.	11.00	1.23	6.412E-03	609.32	46.090	3.799E-01	BI214
727.28	26.	41.66	1.29	5.442E-03	727.17	11.800	PBC<MDA	BI212
794.78	22.	36.86	1.14	5.022E-03				
794.78	22.	36.86	1.14	5.022E-03	795.76	85.400	PBC<MDA	CS134
911.18	62.	20.25	1.60	4.446E-03	911.07	29.000	3.546E-01	AC228

968.62	44.	32.58	1.10	4.213E-03				
968.62	44.	32.58	1.10	4.213E-03	968.90	17.460	4.418E-01	AC228
1120.18	31.	29.60	1.45	3.711E-03	1120.28	15.040	4.164E-01	BI214
1460.62	442.	4.84	2.15	2.943E-03	1460.75	10.700	1.052E+01	K40
1764.18	24.	20.41	2.00	2.481E-03	1764.51	15.920	4.498E-01	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
418.27	209.30	151.	52.	0.026	113.55	1.034	AC-228	
477.28	238.74	103.	414.	0.207	18.04	1.122	PB-212	D
483.74	241.97	118.	68.	0.034	77.46	1.124	PB-214	D
1589.79	794.78	17.	23.	0.012	96.13	1.144	AC-228	

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-212	149.04	74.74	615.	87.	0.044	117.42	1.499
PB-212	153.79	77.11	542.	176.	0.088	60.67	1.499D
PB-214	153.79	77.11	546.	172.	0.086	60.67	1.499D
TH-234	185.48	92.95	578.	99.	0.050	96.06	1.499s
TH-234	185.44	92.93	554.	105.	0.052	93.89	1.499s
RA-226	371.78	186.06	266.	87.	0.043	85.92	1.499
PB-212	477.21	238.75	263.	295.	0.147	28.46	1.499
PB-214	590.39	295.32	91.	128.	0.064	40.61	1.499s
AC-228	676.46	338.34	79.	81.	0.040	55.68	1.499
PB-214	703.59	351.90	84.	142.	0.071	36.71	1.499s
TL-208	1021.33	510.69	62.	41.	0.021	63.96	1.499s
TL-208	1166.53	583.26	41.	119.	0.059	34.82	1.499s
BI-214	1218.76	609.36	37.	149.	0.074	33.01	1.232
AC-228	1822.84	911.25	25.	57.	0.029	52.36	1.578
AC-228	1938.34	968.96	35.	33.	0.017	89.48	1.616
BI-214	2240.94	1120.18	21.	31.	0.015	88.80	1.453s
K-40	2922.26	1460.62	6.	439.	0.220	14.53	2.150
BI-214	3529.80	1764.18	0.	24.	0.012	61.24	1.999

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	MDA Value pCi/gm		COMMENTS
BE-7		2.5069E-02						
			477.56	2.507E-02	%(	3.604E-01	1.03E-01	G
K-40		1.0520E+01						
			1460.75	1.052E+01	(P	3.332E-01	5.12E-01	G
MN-54		1.5515E-02						
			834.81	1.552E-02	%(P	3.708E-02	1.11E-02	G
CO-57		5.5033E-03						
			122.07	5.503E-03	&(	3.875E-02	1.15E-02	G K
			136.43	9.435E-02	%	2.564E-01	7.71E-02	G
CO-60		1.5351E-02						
			1332.51	1.535E-02	&(P	4.033E-02	1.19E-02	G K
			1173.23	2.063E-02	% P	5.889E-02	1.74E-02	G K
Sr-85		-2.0402E-02						
			514.00	-2.040E-02	&(	5.325E-02	1.60E-02	G
Kr-85		-4.8370E+02						
			513.99	-4.837E+02	&(P	1.197E+03	3.57E+02	G
Y-88		-5.9075E-03						
			1836.01	-5.908E-03	%(	4.892E-02	1.29E-02	G K
			898.02	-7.695E-03	% P	4.747E-02	1.34E-02	G
NB-94		8.1400E-03						
			871.10	8.140E-03	&(P	4.033E-02	1.15E-02	G K
			702.50	-3.813E-03	& P	3.315E-02	9.23E-03	G K
Ag-108M		1.2268E-02						
			722.95	1.227E-02	%(	4.155E-02	1.22E-02	G K
			614.37	-9.275E-03	% P	4.475E-02	1.30E-02	G
			433.93	8.654E-03	%	3.336E-02	9.78E-03	G
CD-109		-7.0913E-02						
			88.04	-7.091E-02	%(P	1.355E+00	4.03E-01	G
SN-113		1.8954E-02						
			391.71	1.895E-02	&(	4.509E-02	1.36E-02	G K
			255.04	-6.151E-04	% P	1.459E+00	4.22E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	5.9267E-03						
		427.95	5.927E-03	%(P	8.483E-02	2.37E-02	G K
		600.77	-8.941E-04	& P	2.012E-01	5.57E-02	G
		636.15	8.548E-03	& P	3.398E-01	9.44E-02	G
		463.51	1.074E-01	% P	3.320E-01	9.78E-02	G
		176.29	-7.199E-03	& P	5.591E-01	1.64E-01	G
I-131	6.1189E-04						
		364.48	6.119E-04	%(	4.401E-02	1.24E-02	G K
		636.97	2.485E-01	&	5.795E-01	1.74E-01	G
		284.29	-1.372E-01	%	7.193E-01	2.12E-01	G
CS-134	-7.4166E-04						
		604.66	-7.417E-04	&(P	9.143E-02	2.67E-02	G K
		795.76	-2.620E-03	% P	4.900E-02	1.34E-02	G
		569.29	2.884E-02	% P	2.067E-01	5.84E-02	G
		801.84	-3.054E-02	%	4.102E-01	1.13E-01	G
CS-137	2.1305E-02						
		661.62	2.130E-02	%(P	4.955E-02	1.49E-02	G
CE-139	-2.9357E-05						
		165.85	-2.936E-05	&(P	4.011E-02	1.18E-02	G
EU-152	1.4445E-02						
		121.78	1.445E-02	%(P	1.163E-01	3.45E-02	G K
		344.30	2.739E-02	% P	8.012E-02	2.36E-02	G
		1408.08	-2.081E-03	% P	1.922E-01	4.82E-02	G
		964.00	-5.668E-02	& P	4.270E-01	1.22E-01	G
		1112.07	-9.513E-06	& P	4.569E-01	1.26E-01	G
		778.90	2.893E-02	% P	2.885E-01	8.02E-02	G
EU-154	-1.0932E-02						
		123.10	-1.093E-02	&(P	8.636E-02	2.56E-02	G K
		1274.80	1.313E-02	& P	1.623E-01	4.49E-02	G
		723.30	-3.880E-03	% P	2.286E-01	6.34E-02	G
		1004.80	-1.301E-03	% P	2.791E-01	7.60E-02	G
EU-155	9.4919E-02						
		86.45	9.492E-02	%(	1.374E-01	4.21E-02	G K
		105.31	1.435E-03	%	1.515E-01	4.46E-02	G
HG-203	-6.3784E-03						
		279.17	-6.378E-03	%(	4.400E-02	1.29E-02	G K
		72.87	-2.997E-01	% P	1.011E+00	3.04E-01	G
		70.83	-1.350E-01	%	1.650E+00	4.91E-01	G
		82.50	-9.368E-01	%	2.203E+00	6.66E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	1.6137E-01						
		583.14	1.559E-01	(P	4.258E-02	1.85E-02	G
		510.72	1.824E-01	*(P	1.741E-01	5.40E-02	G
PB-212	3.4617E-01						
		238.63	3.309E-01	(P	8.791E-02	3.21E-02	G K
							Energy duplication
		77.11	4.397E-01	+	2.786E-01	8.89E-02	G
		74.81	4.146E-01	&(P	5.618E-01	1.72E-01	G
PB-214	2.6332E-01						
		351.99	2.633E-01	@(P	8.471E-02	3.27E-02	G K
		295.22	3.894E-01	+ P	1.437E-01	5.34E-02	G
							Energy duplication
		77.11	7.039E-01	+ P	4.572E-01	1.45E-01	G
		241.92	1.637E-02	% P	6.669E-01	1.97E-01	G
BI-212	2.4380E-01						
		727.17	2.438E-01	%(P	3.221E-01	1.03E-01	G K
		1620.56	3.032E-01	%	1.444E+00	3.95E-01	G
		785.42	8.966E-01	% P	1.772E+00	5.41E-01	G
BI-214	4.0146E-01						
		609.32	3.799E-01	(P	7.934E-02	4.21E-02	G K
		1764.51	4.498E-01	(P	1.407E-01	9.35E-02	G
		1120.28	4.164E-01	(P	3.264E-01	1.25E-01	G
RA-224	7.5636E-01						
		241.00	7.564E-01	%(P	1.079E+00	3.32E-01	G
RA-226	1.0749E+00						
		185.99	1.075E+00	(	9.741E-01	3.08E-01	G
AC-228	3.5853E-01						
		911.07	3.338E-01	(P	1.530E-01	6.02E-02	G K
		968.90	3.396E-01	(P	3.093E-01	1.03E-01	G
		338.40	4.458E-01	(P	2.438E-01	8.50E-02	G
TH-227	-1.3295E-01						
		236.00	-1.329E-01	%(P	3.785E-01	1.14E-01	G K
		256.25	-9.353E-02	% P	4.476E-01	1.32E-01	G
PA-234	-2.5890E-02						
		98.44	-2.589E-02	&(	1.562E-01	4.66E-02	G K
		946.00	9.833E-03	&	2.108E-01	5.75E-02	G
		131.28	-2.433E-02	%	1.828E-01	5.44E-02	G
		94.67	1.032E-02	%	2.601E-01	7.71E-02	G
		883.24	-3.318E-04	%	3.371E-01	9.10E-02	G
		926.70	1.587E-03	&	4.077E-01	1.11E-01	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26 4.733E-02 %   3.038E-01 8.64E-02 G

TH-234       9.6572E-01
                           63.29 3.589E-01 %(P 1.749E+00 5.20E-01 G K
                           92.80 1.324E+00 *(P 1.420E+00 4.39E-01 G
                           92.38 1.468E+00 *(P 1.696E+00 5.21E-01 G

AM-241       1.8346E-02
                           59.54 1.835E-02 %(P 2.098E-01 6.20E-02 G
   ( - This peak used in the nuclide activity average.

   * - Peak is too wide, but only one peak in library.
   ! - Peak is part of a multiplet and this area went
       negative during deconvolution.
   ? - Peak is too narrow.
   @ - Peak is too wide at FW25M, but ok at FWHM.
   % - Peak fails sensitivity test.
   $ - Peak identified, but first peak of this nuclide
       failed one or more qualification tests.
   + - Peak activity higher than counting uncertainty range.
   - - Peak activity lower than counting uncertainty range.
   = - Peak outside analysis energy range.
   & - Calculated peak centroid is not close enough to the
       library energy centroid for positive identification.
   P - Peakbackground subtraction
   } - Peak is too close to another for the activity
       to be found directly.

   Nuclide Codes:                      Peak Codes:
   T - Thermal Neutron Activation      G - Gamma Ray
   F - Fast Neutron Activation         X - X-Ray
   I - Fission Product                 P - Positron Decay
   N - Naturally Occurring Isotope     S - Single-Escape
   P - Photon Reaction                 D - Double-Escape
   C - Charged Particle Reaction       K - Key Line
   M - No MDA Calculation              A - Not in Average
   R - Coincidence Corrected           C - Coincidence Peak
   H - Halflife limit exceeded

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
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***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	2.4117E-02	2.5069E-02	3.0843E-01	3.0844E-01	3.467E-01
K-40		1.0520E+01	1.0520E+01	1.5365E+00	1.6475E+00	
MN-54	#A	1.5413E-02	1.5515E-02	3.3207E-02	3.3218E-02	3.683E-02
CO-57	#B	5.4613E-03	5.5033E-03	3.4547E-02	3.4548E-02	3.845E-02
CO-60	#B	1.5335E-02	1.5351E-02	3.5725E-02	3.5735E-02	4.029E-02

Sr-85	#A	-1.9762E-02	-2.0402E-02	4.7951E-02	4.7965E-02	5.158E-02
Kr-85	#A	-4.8369E+02	-4.8370E+02	1.2008E+03	1.2011E+03	1.197E+03
Y-88	#B	-5.7941E-03	-5.9075E-03	3.8833E-02	3.8835E-02	4.798E-02
NB-94	#B	8.1400E-03	8.1400E-03	3.4428E-02	3.4431E-02	4.033E-02
Ag-108M	#B	1.2268E-02	1.2268E-02	3.6454E-02	3.6460E-02	4.155E-02
CD-109	#A	-7.0590E-02	-7.0913E-02	1.3875E+00	1.3875E+00	1.348E+00
SN-113	#B	1.8617E-02	1.8954E-02	4.0682E-02	4.0696E-02	4.428E-02
SB-125	#B	5.9146E-03	5.9267E-03	7.1154E-02	7.1155E-02	8.466E-02
I-131	#B	4.7315E-04	6.1189E-04	3.7348E-02	3.7348E-02	3.403E-02
CS-134	#B	-7.3962E-04	-7.4166E-04	9.9160E-02	9.9160E-02	9.118E-02
CS-137	#A	2.1301E-02	2.1305E-02	4.4550E-02	4.4567E-02	4.954E-02
CE-139	#A	-2.8919E-05	-2.9357E-05	5.1318E-02	5.1318E-02	3.952E-02
EU-152	#B	1.4439E-02	1.4445E-02	1.0360E-01	1.0360E-01	1.163E-01
EU-154	#B	-1.0925E-02	-1.0932E-02	8.9111E-02	8.9113E-02	8.630E-02
EU-155	#B	9.4811E-02	9.4919E-02	1.2628E-01	1.2639E-01	1.373E-01
HG-203	#B	-6.1015E-03	-6.3784E-03	3.8836E-02	3.8838E-02	4.209E-02
TL-208	#	1.6137E-01	1.6137E-01	5.7322E-02	5.8042E-02	4.258E-02
PB-212	#	3.4617E-01	3.4617E-01	1.0059E-01	1.0247E-01	8.791E-02
PB-214	#	2.6332E-01	2.6332E-01	9.8026E-02	9.9148E-02	8.471E-02
BI-212	#B	2.4380E-01	2.4380E-01	3.0787E-01	3.0817E-01	3.221E-01
BI-214		4.0146E-01	4.0146E-01	1.3350E-01	1.3542E-01	
RA-224	#A	7.5636E-01	7.5636E-01	9.9450E-01	9.9542E-01	1.079E+00
RA-226	#	1.0749E+00	1.0749E+00	9.2357E-01	9.2556E-01	9.741E-01
AC-228	#	3.5853E-01	3.5853E-01	1.4416E-01	1.4558E-01	1.530E-01
TH-227	#B	-1.3295E-01	-1.3295E-01	3.5107E-01	3.5115E-01	3.785E-01
PA-234	#B	-2.5890E-02	-2.5890E-02	1.3977E-01	1.3978E-01	1.562E-01
TH-234	#B	9.6572E-01	9.6572E-01	9.6019E-01	9.6168E-01	1.749E+00
AM-241	#A	1.8346E-02	1.8346E-02	1.8595E-01	1.8596E-01	2.098E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (295.1 to 1999.1 keV) 1.0921511E+01 pCi/gm
Total Decayed Activity (295.1 to 1999.1 keV) 1.0921511E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JPK

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 101F_22AUG2006_1143.An1

Sample description
FSS-OOL-05-04-075-F

Spectrum Filename: C:\GammaVision\Spectra\101F_22AUG2006_1143.An1

Acquisition information

Start time:	22-Aug-2006 11:43:27
Live time:	2000
Real time:	2001
Dead time:	0.05 %
Detector ID:	1

Detector system
Det 101- DSPE-633

Calibration
Filename: D1_1LSa.Clb
Detector 101 1.0 Liter Marinelli Sand

Energy Calibration

Created:	03-Sep-2004 08:50:48
Zero offset:	0.244 keV
Gain:	0.500 keV/channel
Quadratic:	-2.493E-08 keV/channel^2

Efficiency Calibration

Created:	03-Sep-2004 08:52:26
Type:	Polynomial
Uncertainty:	0.626 %
Coefficients:	-0.321775 -5.816463 0.734234
	-0.099357 0.006049 -0.000149

Library Files

Main analysis library:	FSS_Rev_1.Lib
Library Match Width:	1.000
Peak stripping:	Library based

Analysis parameters

Analysis engine:	Env32 G53W4.20
Start channel:	100 (50.23keV)
Stop channel:	4000 (1999.11keV)
Peak rejection level:	41.667%
Peak search sensitivity:	3
Sample Size:	6.9000E+02
Activity scaling factor:	1.0000E+06/(1.0000E+00* 6.9000E+02) = 1.4493E+03
Detection limit method:	Nureg 4.16
Random error:	1.0000000E+00
Systematic error:	1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	19-Aug-2006 08:20:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	101_150K_28APR05.Pbc 01-May-2005 05:24:47
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 7 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.0491

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
74.66	70.	30.39	1.50	1.654E-02				
74.66	70.	30.39	1.50	1.654E-02	74.81	9.600	PBC<MDA	PB212
77.07	79.	25.90	1.50	1.720E-02	77.11	10.700	8.385E-01	PB214
					77.11	17.500	PBC<MDA	PB212
77.07	83.	25.90	1.50	1.720E-02	77.11	10.700	8.385E-01	PB214
					77.11	17.500	5.369E-01	PB212
92.89	66.	31.47	1.32	1.990E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
185.93	63.	19.17	1.08	1.858E-02	185.99	3.280	2.031E+00	RA226
209.51	52.	28.82	1.03	1.720E-02				
238.88	290.	8.67	1.19	1.556E-02	238.63	43.100	8.287E-01	PB212
241.60	39.	37.17	1.50	1.545E-02	241.00	3.900	PBC<MDA	RA224
					241.92	7.470	PBC<MDA	PB214
295.28	58.	19.81	1.12	1.292E-02	295.22	19.200	4.439E-01	PB214
338.82	77.	16.69	1.06	1.134E-02	338.40	12.010	1.071E+00	AC228
351.95	108.	13.09	1.10	1.093E-02				
351.95	108.	13.09	1.10	1.093E-02	351.99	37.100	5.123E-01	PB214
511.02	8.	36.48	1.50	7.590E-03	510.72	22.500	PBC<MDA	TL208
583.35	79.	12.47	1.29	6.682E-03	583.14	86.000	2.610E-01	TL208
609.22	66.	16.43	1.16	6.414E-03	609.32	46.090	4.313E-01	BI214
661.74	18.	40.07	1.50	5.937E-03	661.62	84.620	PBC<MDA	CS137
911.24	56.	14.87	1.22	4.446E-03	911.07	29.000	8.191E-01	AC228
968.00	50.	20.02	1.42	4.216E-03				
968.00	50.	20.02	1.42	4.216E-03	968.90	17.460	1.302E+00	AC228
1119.10	26.	28.21	0.70	3.711E-03	1120.28	15.040	9.270E-01	BI214
1460.70	160.	7.91	2.06	2.943E-03	1460.75	10.700	9.811E+00	K40

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
371.51	186.08	42.	63.	0.032	57.50	1.084	PA-234	D
418.70	209.51	68.	52.	0.026	86.45	1.031	AC-228	
477.46	238.88	323.	68.	0.034	117.20	1.187	PB-212	
1936.42	968.00	37.	27.	0.013	113.47	1.424	SB-124	s

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-212	148.88	74.66	226.	70.	0.035	91.17	1.499
PB-214	153.79	77.11	191.	79.	0.039	77.71	1.499D
PB-212	153.79	77.11	187.	83.	0.041	77.71	1.499D
TH-234	185.54	92.98	189.	58.	0.029	89.40	1.499s
TH-234	185.49	92.95	180.	63.	0.031	89.09	1.499s
RA-226	371.48	185.91	87.	60.	0.030	76.13	1.499
PB-212	477.41	238.85	94.	176.	0.088	31.10	1.499
RA-224	482.90	241.60	88.	39.	0.019	111.51	1.499
PB-214	590.32	295.29	58.	59.	0.029	65.11	1.499
AC-228	676.75	338.48	44.	58.	0.029	59.53	1.499s
PB-214	703.87	352.04	25.	96.	0.048	36.69	1.499
TL-208	1166.54	583.27	11.	67.	0.034	40.32	1.499
BI-214	1218.48	609.22	18.	65.	0.033	49.29	1.165
AC-228	1822.67	911.16	10.	42.	0.021	53.12	1.578s
AC-228	1938.32	968.95	19.	24.	0.012	94.53	1.616s
BI-214	2238.80	1119.10	10.	26.	0.013	84.63	0.698s
K-40	2922.42	1460.70	2.	158.	0.079	23.72	2.057

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	Peak MDA Value pCi/gm	COMMENTS
BE-7		-5.0519E-03					
			477.56	-5.052E-03	%(	5.756E-01 1.55E-01	G
K-40		9.8110E+00					
			1460.75	9.811E+00	(P	6.063E-01 7.87E-01	G
MN-54		-1.6946E-03					
			834.81	-1.695E-03	%(P	6.686E-02 1.65E-02	G
CO-57		-1.1562E-02					
			122.07	-1.156E-02	%(	6.199E-02 1.83E-02	G K
			136.43	-1.368E-02	&	4.682E-01 1.35E-01	G
CO-60		-3.6345E-03					
			1332.51	-3.634E-03	%(P	1.128E-01 2.94E-02	G K
			1173.23	2.184E-02	& P	1.017E-01 2.84E-02	G K
Sr-85		-2.2897E-02					
			514.00	-2.290E-02	&(	9.601E-02 2.80E-02	G
Kr-85		-5.8219E+02					
			513.99	-5.822E+02	&(P	2.167E+03 6.26E+02	G
Y-88		0.0000E+00					
			1836.01	0.000E+00	%(	6.200E-02 8.41E-03	G K
			898.02	6.838E-04	% P	9.797E-02 2.58E-02	G
NB-94		-6.9672E-04					
			871.10	-6.967E-04	%(P	9.130E-02 2.41E-02	G K
			702.50	1.553E-02	% P	6.137E-02 1.74E-02	G K
Ag-108M		8.5547E-03					
			722.95	8.555E-03	%(	8.265E-02 2.26E-02	G K
			614.37	-2.243E-03	% P	9.228E-02 2.53E-02	G
			433.93	-2.087E-04	%	6.460E-02 1.76E-02	G
CD-109		-1.4277E+00					
			88.04	-1.428E+00	%(P	2.067E+00 6.35E-01	G
SN-113		-1.3007E-02					
			391.71	-1.301E-02	%(	9.470E-02 2.69E-02	G K
			255.04	2.151E-01	& P	2.535E+00 7.25E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	1.9275E-02						
		427.95	1.928E-02	&(P	1.692E-01	4.66E-02	G K
		600.77	-3.350E-02	% P	3.844E-01	1.05E-01	G
		636.15	4.937E-02	& P	5.055E-01	1.34E-01	G
		463.51	6.776E-02	& P	6.232E-01	1.72E-01	G
		176.29	1.475E-02	& P	8.047E-01	2.30E-01	G
I-131	1.3151E-02						
		364.48	1.315E-02	%(	6.800E-02	1.92E-02	G K
		636.97	-2.248E-03	&	1.421E+00	3.84E-01	G
		284.29	1.578E-01	&	9.409E-01	2.69E-01	G
CS-134	-1.0281E-02						
		604.66	-1.028E-02	%(P	7.723E-02	2.12E-02	G K
		795.76	-1.667E-02	% P	9.726E-02	2.67E-02	G
		569.29	2.167E-02	& P	4.551E-01	1.24E-01	G
		801.84	1.132E-01	%	6.774E-01	1.83E-01	G
CS-137	6.9412E-02						
		661.62	6.941E-02	%(P	9.094E-02	2.92E-02	G
CE-139	4.7210E-04						
		165.85	4.721E-04	&(P	6.718E-02	1.94E-02	G
EU-152	-3.8940E-02						
		121.78	-3.894E-02	%(P	1.869E-01	5.50E-02	G K
		344.30	-4.918E-02	& P	2.228E-01	6.40E-02	G
		1408.08	9.646E-02	% P	3.671E-01	1.01E-01	G
		964.00	-1.624E-01	% P	8.267E-01	2.33E-01	G
		1112.07	-4.921E-02	& P	7.531E-01	2.00E-01	G
		778.90	8.416E-02	% P	4.714E-01	1.28E-01	G
EU-154	-5.2833E-05						
		123.10	-5.283E-05	%(P	9.512E-02	2.69E-02	G K
		1274.80	-5.279E-02	% P	3.268E-01	9.04E-02	G
		723.30	-1.283E-01	% P	4.966E-01	1.43E-01	G
		1004.80	-5.883E-02	% P	6.096E-01	1.67E-01	G
EU-155	1.4990E-01						
		86.45	1.499E-01	%(	2.312E-01	7.10E-02	G K
		105.31	9.061E-02	%	2.420E-01	7.26E-02	G
HG-203	4.1553E-03						
		279.17	4.155E-03	%(	5.412E-02	1.52E-02	G K
		72.87	-5.424E-01	% P	1.766E+00	5.27E-01	G
		70.83	1.034E+00	%	2.325E+00	7.03E-01	G
		82.50	6.258E-01	&	3.727E+00	1.10E+00	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	2.2890E-01						
		583.14	2.289E-01	(P	6.260E-02	3.19E-02	G
		510.72	8.786E-02	% P	3.754E-01	9.91E-02	G
PB-212	5.2088E-01						
		238.63	5.144E-01	(P	1.396E-01	5.52E-02	G K
							Energy duplication
		77.11	5.369E-01	(	4.325E-01	1.39E-01	G
		74.81	8.580E-01	& P	8.980E-01	2.80E-01	G
PB-214	4.6372E-01						
		351.99	4.640E-01	(P	1.252E-01	5.79E-02	G K
		295.22	4.631E-01	(P	3.006E-01	1.04E-01	G
							Energy duplication
		77.11	8.385E-01	+ P	7.141E-01	2.27E-01	G
		241.92	-1.516E-02	% P	9.576E-01	2.76E-01	G
BI-212	4.1393E-01						
		727.17	4.139E-01	%(P	5.750E-01	1.85E-01	G K
		1620.56	0.000E+00	%	4.221E+00	1.06E+00	G
		785.42	1.151E+00	& P	3.213E+00	9.38E-01	G
BI-214	4.3132E-01						
		609.32	4.313E-01	(P	1.486E-01	7.21E-02	G K
		1764.51	1.998E-01	% P	7.612E-01	2.12E-01	G
		1120.28	9.270E-01	+ P	6.013E-01	2.65E-01	G
RA-224	1.2564E+00						
		241.00	1.256E+00	(P	1.510E+00	4.76E-01	G
RA-226	1.9389E+00						
		185.99	1.939E+00	(	1.484E+00	4.92E-01	G
AC-228	6.7972E-01						
		911.07	6.370E-01	(P	2.654E-01	1.18E-01	G K
		968.90	6.438E-01	@(P	6.135E-01	2.09E-01	G
		338.40	8.351E-01	*(P	4.813E-01	1.72E-01	G
TH-227	-9.0027E-02						
		236.00	-9.003E-02	%(P	6.202E-01	1.81E-01	G K
		256.25	1.079E-01	& P	7.441E-01	2.14E-01	G
PA-234	7.7313E-03						
		98.44	7.731E-03	&(	2.338E-01	6.80E-02	G K
		946.00	-1.714E-03	%	4.611E-01	1.21E-01	G
		131.28	1.962E-03	&	2.713E-01	7.86E-02	G
		94.67	6.699E-03	%	4.210E-01	1.23E-01	G
		883.24	1.639E-02	&	6.668E-01	1.75E-01	G
		926.70	-1.310E-01	%	8.349E-01	2.32E-01	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26 4.423E-02 &   6.671E-01 1.83E-01 G

TH-234       1.6133E+00
                           63.29 8.611E-01 %(P 3.101E+00 9.16E-01 G K
                           92.80 2.053E+00 *(P 2.141E+00 6.70E-01 G
                           92.38 2.242E+00 *(P 2.565E+00 7.92E-01 G

AM-241       1.8776E-02
                           59.54 1.878E-02 &(P 3.848E-01 1.12E-01 G
   ( - This peak used in the nuclide activity average.

   * - Peak is too wide, but only one peak in library.
   ! - Peak is part of a multiplet and this area went
       negative during deconvolution.
   ? - Peak is too narrow.
   @ - Peak is too wide at FW25M, but ok at FWHM.
   % - Peak fails sensitivity test.
   $ - Peak identified, but first peak of this nuclide
       failed one or more qualification tests.
   + - Peak activity higher than counting uncertainty range.
   - - Peak activity lower than counting uncertainty range.
   = - Peak outside analysis energy range.
   & - Calculated peak centroid is not close enough to the
       library energy centroid for positive identification.
   P - Peakbackground subtraction
   } - Peak is too close to another for the activity
       to be found directly.

   Nuclide Codes:                      Peak Codes:
   T - Thermal Neutron Activation      G - Gamma Ray
   F - Fast Neutron Activation         X - X-Ray
   I - Fission Product                 P - Positron Decay
   N - Naturally Occurring Isotope     S - Single-Escape
   P - Photon Reaction                 D - Double-Escape
   C - Charged Particle Reaction       K - Key Line
   M - No MDA Calculation              A - Not in Average
   R - Coincidence Corrected           C - Coincidence Peak
   H - Halflife limit exceeded

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
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***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	-4.8500E-03	-5.0519E-03	4.6490E-01	4.6490E-01	5.526E-01
K-40		9.8110E+00	9.8110E+00	2.3605E+00	2.4247E+00	
MN-54	#A	-1.6828E-03	-1.6946E-03	8.2654E+00	8.2654E+00	6.640E-02
CO-57	#B	-1.1469E-02	-1.1562E-02	5.4791E-02	5.4795E-02	6.149E-02
CO-60	#B	-3.6304E-03	-3.6345E-03	1.1847E-01	1.1847E-01	1.127E-01

Sr-85	#A	-2.2141E-02	-2.2897E-02	8.4118E-02	8.4128E-02	9.284E-02
Kr-85	#A	-5.8217E+02	-5.8219E+02	2.3997E+03	2.4000E+03	2.167E+03
Y-88	#B	0.0000E+00	0.0000E+00	2.5237E-02	2.5241E-02	6.074E-02
NB-94	#B	-6.9672E-04	-6.9672E-04	6.9021E-01	6.9021E-01	9.130E-02
Ag-108M	#B	8.5543E-03	8.5547E-03	6.7777E-02	6.7779E-02	8.265E-02
CD-109	#A	-1.4208E+00	-1.4277E+00	1.9398E+00	1.9414E+00	2.057E+00
SN-113	#B	-1.2763E-02	-1.3007E-02	8.0745E-02	8.0748E-02	9.293E-02
SB-125	#B	1.9234E-02	1.9275E-02	1.3992E-01	1.3992E-01	1.688E-01
I-131	#B	1.0031E-02	1.3151E-02	5.7684E-02	5.7688E-02	5.187E-02
CS-134	#B	-1.0251E-02	-1.0281E-02	9.2962E-02	9.2964E-02	7.700E-02
CS-137	#A	6.9398E-02	6.9412E-02	8.7578E-02	8.7666E-02	9.093E-02
CE-139	#A	4.6469E-04	4.7210E-04	5.8053E-02	5.8053E-02	6.612E-02
EU-152	#B	-3.8921E-02	-3.8940E-02	1.8763E-01	1.8764E-01	1.868E-01
EU-154	#B	-5.2796E-05	-5.2833E-05	8.4855E-02	8.4855E-02	9.505E-02
EU-155	#B	1.4972E-01	1.4990E-01	2.1292E-01	2.1309E-01	2.309E-01
HG-203	#B	3.9655E-03	4.1553E-03	4.5477E-02	4.5477E-02	5.165E-02
TL-208	#	2.2890E-01	2.2890E-01	9.5556E-02	9.6427E-02	6.260E-02
PB-212	#	5.2088E-01	5.2088E-01	1.6765E-01	1.7022E-01	1.396E-01
PB-214	#	4.6372E-01	4.6372E-01	1.7363E-01	1.7559E-01	1.252E-01
BI-212	#B	4.1393E-01	4.1393E-01	5.5576E-01	5.5625E-01	5.750E-01
BI-214		4.3132E-01	4.3132E-01	2.1620E-01	2.1757E-01	
RA-224	#A	1.2564E+00	1.2564E+00	1.4269E+00	1.4286E+00	1.510E+00
RA-226	#	1.9389E+00	1.9389E+00	1.4761E+00	1.4802E+00	1.484E+00
AC-228	#	6.7972E-01	6.7972E-01	2.8987E-01	2.9240E-01	2.654E-01
TH-227	#B	-9.0027E-02	-9.0027E-02	6.0624E-01	6.0626E-01	6.202E-01
PA-234	#B	7.7313E-03	7.7313E-03	2.0405E-01	2.0405E-01	2.338E-01
TH-234	#B	1.6133E+00	1.6133E+00	1.5793E+00	1.5818E+00	3.101E+00
AM-241	#A	1.8776E-02	1.8776E-02	3.3587E-01	3.3587E-01	3.848E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (209.2 to 1999.1 keV) 1.0242278E+01 pCi/gm
Total Decayed Activity (209.2 to 1999.1 keV) 1.0242278E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JJM

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 101F_23AUG2006_1111.An1

Sample description
FSS-OOL-05-04-085-F-B

Spectrum Filename: C:\GammaVision\Spectra\101F_23AUG2006_1111.An1

Acquisition information

Start time:	23-Aug-2006 11:11:28
Live time:	2000
Real time:	2002
Dead time:	0.09 %
Detector ID:	1

Detector system
Det 101- DSPE-633

Calibration
Filename: D1_1LSa.Clb
Detector 101 1.0 Liter Marinelli Sand

Energy Calibration

Created:	03-Sep-2004 08:50:48
Zero offset:	0.244 keV
Gain:	0.500 keV/channel
Quadratic:	-2.493E-08 keV/channel^2

Efficiency Calibration

Created:	03-Sep-2004 08:52:26
Type:	Polynomial
Uncertainty:	0.626 %
Coefficients:	-0.321775 -5.816463 0.734234
	-0.099357 0.006049 -0.000149

Library Files

Main analysis library:	FSS_Rev_1.Lib
Library Match Width:	1.000
Peak stripping:	Library based

Analysis parameters

Analysis engine:	Env32 G53W4.20
Start channel:	100 (50.23keV)
Stop channel:	4000 (1999.11keV)
Peak rejection level:	41.667%
Peak search sensitivity:	3
Sample Size:	1.8760E+03
Activity scaling factor:	1.0000E+06/(1.0000E+00* 1.8760E+03) = 5.3305E+02
Detection limit method:	Nureg 4.16
Random error:	1.0000000E+00
Systematic error:	1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	19-Aug-2006 15:38:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	101_150K_28APR05.Pbc 01-May-2005 05:24:47
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 14 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.1092

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
74.91	158.	29.45	1.50	1.654E-02				
74.91	158.	29.45	1.50	1.654E-02	74.81	9.600	7.185E-01	PB212
77.04	304.	15.32	1.50	1.720E-02	77.11	17.500	7.282E-01	PB212
					77.11	10.700	1.176E+00	PB214
77.04	301.	15.32	1.50	1.720E-02	77.11	17.500	7.193E-01	PB212
					77.11	10.700	1.176E+00	PB214
93.36	127.	23.20	1.02	1.995E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
186.27	163.	21.28	1.23	1.857E-02	185.99	3.280	1.926E+00	RA226
209.62	72.	38.08	0.96	1.720E-02				
238.75	744.	4.31	1.12	1.557E-02	238.63	43.100	7.923E-01	PB212
242.01	95.	21.09	1.12	1.540E-02	241.00	3.900	PBC<MDA	RA224
					241.92	7.470	PBC<MDA	PB214
270.13	63.	35.84	0.96	1.401E-02				
295.38	170.	12.67	1.15	1.291E-02	295.22	19.200	4.879E-01	PB214
327.53	96.	20.73	0.72	1.171E-02				
338.20	153.	16.89	1.24	1.136E-02	338.40	12.010	7.991E-01	AC228
352.04	244.	10.42	1.32	1.092E-02	351.99	37.100	4.301E-01	PB214
462.95	44.	36.08	0.84	8.351E-03				
462.95	44.	36.08	0.84	8.351E-03	463.51	10.000	PBC<MDA	SB125
510.67	132.	17.47	1.43	7.591E-03	510.72	22.500	4.892E-01	TL208
583.26	252.	9.02	1.33	6.683E-03	583.14	86.000	3.134E-01	TL208
609.33	185.	12.89	1.00	6.413E-03	609.32	46.090	4.482E-01	BI214
					614.37	90.393	2.316E-01	Ag108M
661.67	108.	18.11	1.42	5.937E-03	661.62	84.620	1.533E-01	CS137
727.38	58.	28.00	0.96	5.442E-03	727.17	11.800	6.418E-01	BI212
794.81	23.	37.12	1.50	5.016E-03	795.76	85.400	PBC<MDA	CS134

911.06	172.	10.72	1.66	4.447E-03	911.07	29.000	9.515E-01	AC228
968.31	142.	12.49	1.55	4.214E-03	968.90	17.460	1.380E+00	AC228
1460.64	583.	4.16	2.09	2.943E-03	1460.75	10.700	1.329E+01	K40
1588.41	39.	16.01	1.42	2.731E-03				
1764.67	15.	31.99	2.11	2.481E-03	1764.51	15.920	2.757E-01	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
418.91	209.62	307.	72.	0.036	114.25	0.964	NP-239	s
477.20	238.69	142.	744.	0.372	12.93	1.122	PB-212	D
483.72	241.94	152.	95.	0.047	63.26	1.124	PB-214	D
539.99	270.13	200.	63.	0.031	107.53	0.964	AC-228	
654.84	327.53	122.	96.	0.048	62.20	0.724	AC-228	s
925.80	462.95	80.	44.	0.022	108.24	0.840	AC-228	l
3178.00	1588.41	0.	39.	0.020	48.04	1.424	AC-228	s

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-212	149.39	74.91	1085.	158.	0.079	88.35	1.499
PB-212	153.79	77.11	934.	304.	0.152	45.95	1.499D
PB-214	153.79	77.11	938.	301.	0.150	45.95	1.499D
TH-234	186.09	93.25	867.	151.	0.075	80.37	1.499s
TH-234	186.07	93.25	893.	158.	0.079	80.55	1.499s
RA-226	372.19	186.27	400.	163.	0.082	63.84	1.231s
PB-212	477.23	238.77	380.	587.	0.294	18.51	1.499
PB-214	590.60	295.43	201.	162.	0.081	43.52	1.499s
AC-228	676.19	338.20	181.	151.	0.076	50.67	1.237
PB-214	704.03	352.12	118.	216.	0.108	29.14	1.499
TL-208	1021.28	510.67	124.	116.	0.058	52.40	1.430s
TL-208	1166.53	583.26	83.	250.	0.125	27.05	1.327
BI-214	1218.70	609.33	97.	184.	0.092	38.68	0.996
CS-137	1323.43	661.67	89.	107.	0.053	54.34	1.421
BI-212	1454.91	727.38	63.	57.	0.029	84.00	0.964s
CS-134	1589.84	794.81	28.	23.	0.012	111.36	1.502
AC-228	1822.46	911.06	49.	170.	0.085	32.16	1.661
AC-228	1937.03	968.31	51.	141.	0.070	37.48	1.553
K-40	2922.30	1460.64	4.	581.	0.290	12.49	2.091
BI-214	3530.77	1764.67	5.	15.	0.008	95.97	2.106

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	Peak MDA Value pCi/gm	COMMENTS
BE-7		-2.5959E-03					
			477.56	-2.596E-03	%(	4.273E-01 1.22E-01	G
K-40		1.3286E+01					
			1460.75	1.329E+01	(P	2.826E-01 5.55E-01	G
MN-54		-7.8117E-03					
			834.81	-7.812E-03	&(P	4.678E-02 1.33E-02	G
CO-57		-3.3466E-03					
			122.07	-3.347E-03	%(	5.079E-02 1.51E-02	G K
			136.43	-1.534E-01	%	4.144E-01 1.25E-01	G
CO-60		3.9351E-02					
			1332.51	3.935E-02	%(P	5.426E-02 1.74E-02	G K
			1173.23	4.852E-02	% P	6.732E-02 2.12E-02	G K
Sr-85		-1.4901E-02					
			514.00	-1.490E-02	%(	5.536E-02 1.64E-02	G
Kr-85		-3.5574E+02					
			513.99	-3.557E+02	%(P	1.232E+03 3.64E+02	G
Y-88		-7.7823E-03					
			1836.01	-7.782E-03	%(	5.626E-02 1.53E-02	G K
			898.02	-6.257E-04	% P	4.420E-02 1.20E-02	G
NB-94		-8.1327E-03					
			871.10	-8.133E-03	&(P	5.280E-02 1.51E-02	G K
			702.50	8.854E-03	& P	4.546E-02 1.32E-02	G K
Ag-108M		-3.0970E-03					
			722.95	-3.097E-03	%(	1.006E-01 2.94E-02	G K
			614.37	6.144E-03	% P	4.099E-02 1.17E-02	G
			433.93	0.000E+00	&	4.821E-02 1.39E-02	G
CD-109		-3.6231E-02					
			88.04	-3.623E-02	%(P	1.552E+00 4.63E-01	G
SN-113		-8.3915E-03					
			391.71	-8.392E-03	&(	6.463E-02 1.89E-02	G K
			255.04	1.825E-01	% P	1.879E+00 5.54E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	2.0088E-02						
		427.95	2.009E-02	&(P	1.271E-01	3.70E-02	G K
		600.77	-3.484E-02	% P	2.306E-01	6.64E-02	G
		636.15	-6.339E-03	% P	3.470E-01	9.66E-02	G
		463.51	2.334E-01	% P	4.033E-01	1.23E-01	G
		176.29	1.733E-01	% P	5.982E-01	1.79E-01	G
I-131	0.0000E+00						
		364.48	0.000E+00	%(	7.213E-02	2.09E-02	G K
		636.97	4.681E-03	%	7.515E-01	2.10E-01	G
		284.29	-1.244E-01	%	9.228E-01	2.73E-01	G
CS-134	1.7631E-02						
		604.66	-1.553E-03	%(P	3.701E-02	1.03E-02	G K
		795.76	3.956E-02	(P	4.596E-02	1.49E-02	G
		569.29	8.777E-02	% P	2.739E-01	8.11E-02	G
		801.84	8.404E-02	&	4.980E-01	1.42E-01	G
CS-137	1.5332E-01						
		661.62	1.533E-01	(P	6.696E-02	2.80E-02	G
CE-139	2.9614E-03						
		165.85	2.961E-03	%(P	5.265E-02	1.56E-02	G
EU-152	-9.1397E-04						
		121.78	-9.140E-04	%(P	1.475E-01	4.38E-02	G K
		344.30	-1.568E-02	& P	1.401E-01	4.09E-02	G
		1408.08	5.444E-02	% P	1.794E-01	5.13E-02	G
		964.00	-5.462E-03	% P	6.141E-01	1.76E-01	G
		1112.07	-1.513E-03	% P	4.230E-01	1.16E-01	G
		778.90	-2.943E-02	% P	3.854E-01	1.09E-01	G
EU-154	2.0024E-02						
		123.10	2.002E-02	%(P	9.696E-02	2.90E-02	G K
		1274.80	4.399E-02	& P	1.380E-01	4.03E-02	G
		723.30	-9.939E-02	% P	3.406E-01	1.01E-01	G
		1004.80	-3.581E-02	% P	3.170E-01	8.99E-02	G
EU-155	8.6430E-02						
		86.45	8.643E-02	%(	1.703E-01	5.17E-02	G K
		105.31	-1.693E-03	&	2.097E-01	6.24E-02	G
HG-203	-1.1662E-02						
		279.17	-1.166E-02	%(	5.783E-02	1.72E-02	G K
		72.87	7.352E-02	% P	7.689E-01	2.28E-01	G
		70.83	6.793E-01	&	1.617E+00	4.89E-01	G
		82.50	-8.122E-01	%	2.705E+00	8.15E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	3.1342E-01						
		583.14	3.134E-01	(P	5.655E-02	2.85E-02	G
		510.72	4.892E-01	+ P	2.303E-01	9.72E-02	G
PB-212	6.6686E-01						
		238.63	6.304E-01	(P	1.004E-01	3.93E-02	G K
							Energy duplication
		77.11	7.282E-01	(	3.473E-01	1.12E-01	G
		74.81	7.185E-01	&(P	7.085E-01	2.19E-01	G
PB-214	4.1343E-01						
		351.99	3.844E-01	(P	9.464E-02	3.77E-02	G K
		295.22	4.695E-01	(P	1.998E-01	6.89E-02	G
							Energy duplication
		77.11	1.176E+00	+ P	5.691E-01	1.82E-01	G
		241.92	-1.590E-02	% P	7.653E-01	2.27E-01	G
BI-212	6.4178E-01						
		727.17	6.418E-01	(P	4.445E-01	1.82E-01	G K
		1620.56	2.444E-01	%	1.820E+00	4.97E-01	G
		785.42	3.787E-02	% P	2.750E+00	7.77E-01	G
BI-214	4.4818E-01						
		609.32	4.482E-01	(P	1.185E-01	5.81E-02	G K
		1764.51	2.757E-01	- P	2.402E-01	9.07E-02	G
		1120.28	3.014E-01	% P	4.615E-01	1.43E-01	G
RA-224	8.4977E-01						
		241.00	8.498E-01	%(P	1.290E+00	3.94E-01	G
RA-226	1.9264E+00						
		185.99	1.926E+00	*(	1.133E+00	4.10E-01	G
AC-228	9.0688E-01						
		911.07	9.515E-01	(P	1.967E-01	1.03E-01	G K
		968.90	1.380E+00	+ P	3.529E-01	1.73E-01	G
		338.40	7.991E-01	(P	3.454E-01	1.37E-01	G
TH-227	-2.2028E-01						
		236.00	-2.203E-01	%(P	4.507E-01	1.37E-01	G K
		256.25	-4.442E-02	& P	5.971E-01	1.76E-01	G
PA-234	-6.6495E-02						
		98.44	-6.649E-02	%(	1.650E-01	4.99E-02	G K
		946.00	-3.953E-02	%	2.725E-01	7.80E-02	G
		131.28	4.926E-03	&	2.265E-01	6.74E-02	G
		94.67	-8.502E-02	&	3.188E-01	9.59E-02	G
		883.24	7.440E-02	%	2.973E-01	8.54E-02	G
		926.70	1.017E-01	%	4.843E-01	1.40E-01	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26 1.341E-01 %   4.037E-01 1.20E-01 G

TH-234       1.5416E+00
                           63.29 8.764E-01 %(P 2.117E+00 6.38E-01 G K
                           92.80 1.904E+00 *(P 1.713E+00 5.31E-01 G
                           92.38 2.128E+00 *(P 1.976E+00 6.11E-01 G

AM-241      -3.8755E-02
                           59.54-3.876E-02 %(P 2.685E-01 8.01E-02 G
   ( - This peak used in the nuclide activity average.

   * - Peak is too wide, but only one peak in library.
   ! - Peak is part of a multiplet and this area went
       negative during deconvolution.
   ? - Peak is too narrow.
   @ - Peak is too wide at FW25M, but ok at FWHM.
   % - Peak fails sensitivity test.
   $ - Peak identified, but first peak of this nuclide
       failed one or more qualification tests.
   + - Peak activity higher than counting uncertainty range.
   - - Peak activity lower than counting uncertainty range.
   = - Peak outside analysis energy range.
   & - Calculated peak centroid is not close enough to the
       library energy centroid for positive identification.
   P - Peakbackground subtraction
   } - Peak is too close to another for the activity
       to be found directly.

   Nuclide Codes:                      Peak Codes:
   T - Thermal Neutron Activation      G - Gamma Ray
   F - Fast Neutron Activation         X - X-Ray
   I - Fission Product                 P - Positron Decay
   N - Naturally Occurring Isotope     S - Single-Escape
   P - Photon Reaction                 D - Double-Escape
   C - Charged Particle Reaction       K - Key Line
   M - No MDA Calculation              A - Not in Average
   R - Coincidence Corrected           C - Coincidence Peak
   H - Halflife limit exceeded

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
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***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	-2.4705E-03	-2.5959E-03	3.6696E-01	3.6696E-01	4.067E-01
K-40		1.3286E+01	1.3286E+01	1.6658E+00	1.8271E+00	
MN-54	#A	-7.7459E-03	-7.8117E-03	4.6900E-02	4.6902E-02	4.639E-02
CO-57	#B	-3.3140E-03	-3.3466E-03	4.5385E-02	4.5386E-02	5.030E-02
CO-60	#B	3.9297E-02	3.9351E-02	5.2127E-02	5.2175E-02	5.419E-02

Sr-85	#A	-1.4305E-02	-1.4901E-02	4.9309E-02	4.9316E-02	5.315E-02
Kr-85	#A	-3.5573E+02	-3.5574E+02	1.2659E+03	1.2661E+03	1.232E+03
Y-88	#B	-7.5917E-03	-7.7823E-03	4.5983E-02	4.5985E-02	5.488E-02
NB-94	#B	-8.1327E-03	-8.1327E-03	4.7781E-02	4.7783E-02	5.280E-02
Ag-108M	#B	-3.0968E-03	-3.0970E-03	8.8200E-02	8.8200E-02	1.006E-01
CD-109	#A	-3.6020E-02	-3.6231E-02	1.7971E+00	1.7971E+00	1.543E+00
SN-113	#B	-8.2009E-03	-8.3915E-03	5.6744E-02	5.6746E-02	6.316E-02
SB-125	#B	2.0036E-02	2.0088E-02	1.1114E-01	1.1114E-01	1.267E-01
I-131	#B	0.0000E+00	0.0000E+00	6.2794E-02	6.2794E-02	5.192E-02
CS-134	#B	1.7569E-02	1.7631E-02	1.9984E-02	2.0009E-02	3.688E-02
CS-137		1.5329E-01	1.5332E-01	8.3999E-02	8.4445E-02	
CE-139	#A	2.9050E-03	2.9614E-03	4.6909E-02	4.6910E-02	5.164E-02
EU-152	#B	-9.1345E-04	-9.1397E-04	2.0593E-01	2.0593E-01	1.474E-01
EU-154	#B	2.0007E-02	2.0024E-02	8.7037E-02	8.7044E-02	9.687E-02
EU-155	#B	8.6304E-02	8.6430E-02	1.5516E-01	1.5523E-01	1.701E-01
HG-203	#B	-1.1018E-02	-1.1662E-02	5.1659E-02	5.1663E-02	5.464E-02
TL-208		3.1342E-01	3.1342E-01	8.5569E-02	8.7383E-02	
PB-212	#	6.6686E-01	6.6686E-01	1.2473E-01	1.3030E-01	1.004E-01
PB-214	#	4.1343E-01	4.1343E-01	1.0939E-01	1.1186E-01	9.464E-02
BI-212		6.4178E-01	6.4178E-01	5.4548E-01	5.4668E-01	
BI-214		4.4818E-01	4.4818E-01	1.7441E-01	1.7624E-01	
RA-224	#A	8.4977E-01	8.4977E-01	1.1835E+00	1.1845E+00	1.290E+00
RA-226	#	1.9264E+00	1.9264E+00	1.2297E+00	1.2345E+00	
AC-228		9.0688E-01	9.0688E-01	2.7579E-01	2.8051E-01	
TH-227	#B	-2.2028E-01	-2.2028E-01	4.1673E-01	4.1692E-01	4.507E-01
PA-234	#B	-6.6495E-02	-6.6495E-02	1.4956E-01	1.4961E-01	1.650E-01
TH-234	#B	1.5416E+00	1.5416E+00	1.2814E+00	1.2842E+00	2.117E+00
AM-241	#A	-3.8754E-02	-3.8755E-02	2.6718E-01	2.6719E-01	2.685E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (269.6 to 1999.1 keV) 1.7676331E+01 pCi/gm
Total Decayed Activity (269.6 to 1999.1 keV) 1.7676374E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JPK

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 101F_24AUG2006_0847.An1

Sample description
FSS-OOL-05-04-087-F-I

Spectrum Filename: C:\GammaVision\Spectra\101F_24AUG2006_0847.An1

Acquisition information
Start time: 24-Aug-2006 08:47:54
Live time: 2000
Real time: 2002
Dead time: 0.10 %
Detector ID: 1

Detector system
Det 101- DSPE-633

Calibration
Filename: D1_1LSa.Clb
Detector 101 1.0 Liter Marinelli Sand

Energy Calibration
Created: 03-Sep-2004 08:50:48
Zero offset: 0.244 keV
Gain: 0.500 keV/channel
Quadratic: -2.493E-08 keV/channel^2

Efficiency Calibration
Created: 03-Sep-2004 08:52:26
Type: Polynomial
Uncertainty: 0.626 %
Coefficients: -0.321775 -5.816463 0.734234
-0.099357 0.006049 -0.000149

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.23keV)
Stop channel: 4000 (1999.11keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 1.7340E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.7340E+03) =
5.7670E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	23-Aug-2006 16:00:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	101_150K_28APR05.Pbc 01-May-2005 05:24:47
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 12 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.1960

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
74.82	116.	35.19	1.50	1.654E-02				
74.82	116.	35.19	1.50	1.654E-02	74.81	9.600	PBC<MDA	PB212
77.11	234.	17.71	1.50	1.720E-02	77.11	17.500	6.060E-01	PB212
					77.11	10.700	9.754E-01	PB214
77.11	230.	17.71	1.50	1.720E-02	77.11	17.500	5.964E-01	PB212
					77.11	10.700	9.754E-01	PB214
93.06	107.	33.74	1.50	1.989E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
93.09	101.	35.01	1.50	1.985E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
185.63	104.	27.07	0.99	1.860E-02				
185.63	104.	27.07	0.99	1.860E-02	185.99	3.280	1.330E+00	RA226
209.41	70.	27.63	1.07	1.721E-02				
238.71	628.	4.75	1.12	1.557E-02	238.63	43.100	7.217E-01	PB212
241.54	80.	25.14	1.12	1.542E-02	241.00	3.900	PBC<MDA	RA224
					241.92	7.470	PBC<MDA	PB214
270.07	79.	25.49	1.52	1.401E-02				
295.29	111.	14.96	1.16	1.291E-02	295.22	19.200	3.442E-01	PB214
300.04	41.	34.35	1.16	1.272E-02				
327.97	45.	39.37	0.92	1.170E-02				
338.51	155.	15.97	1.31	1.135E-02	338.40	12.010	8.737E-01	AC228
351.85	227.	11.63	1.18	1.093E-02				
351.85	227.	11.63	1.18	1.093E-02	351.99	37.100	4.323E-01	PB214
463.02	55.	33.08	1.08	8.350E-03				
463.02	55.	33.08	1.08	8.350E-03	463.51	10.000	5.006E-01	SB125
511.56	86.	21.00	0.86	7.578E-03	510.72	22.500	3.211E-01	TL208
583.02	209.	9.31	1.41	6.686E-03	583.14	86.000	2.802E-01	TL208

609.23	139.	13.69	1.50	6.414E-03	609.32	46.090	3.625E-01	BI214
661.54	186.	9.56	1.66	5.938E-03	661.62	84.620	2.871E-01	CS137
794.86	45.	32.47	1.12	5.021E-03				
794.86	45.	32.47	1.12	5.021E-03	795.76	85.400	8.152E-02	CS134
860.52	44.	25.42	1.42	4.677E-03				
910.83	137.	11.28	1.62	4.448E-03				
910.83	137.	11.28	1.62	4.448E-03	911.07	29.000	8.191E-01	AC228
967.86	107.	14.21	2.07	4.216E-03				
967.86	107.	14.21	2.07	4.216E-03	968.90	17.460	1.127E+00	AC228
1120.24	41.	24.38	0.79	3.711E-03	1120.28	15.040	5.728E-01	BI214
1460.41	504.	4.49	1.90	2.943E-03	1460.75	10.700	1.243E+01	K40

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
1763.60	31.	20.94	1.04	2.481E-03	1764.51	15.920	6.207E-01	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
370.92	185.63	287.	104.	0.052	81.22	0.986	U-235	l
418.50	209.41	158.	70.	0.035	82.89	1.069	AC-228	
477.11	238.70	131.	628.	0.314	14.26	1.122	PB-212	D
482.78	241.53	161.	80.	0.040	75.43	1.124	PB-214	D
539.86	270.07	140.	79.	0.039	76.48	1.524	AC-228	s
599.95	300.10	88.	42.	0.021	105.46	1.008	PB-212	
655.72	327.97	112.	45.	0.023	118.10	0.923	AC-228	s
1589.93	794.86	43.	47.	0.024	73.04	1.116	AC-228	s
1721.34	860.52	22.	44.	0.022	76.25	1.416	TL-208	s
1936.12	967.86	90.	49.	0.025	92.23	2.071	SB-124	s

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-212	149.20	74.82	861.	116.	0.058	105.56	1.499
PB-212	153.79	77.11	743.	234.	0.117	53.14	1.499D
PB-214	153.79	77.11	747.	230.	0.115	53.14	1.499D
TH-234	185.76	93.09	723.	101.	0.051	105.04	1.499s
TH-234	185.71	93.06	683.	107.	0.054	101.22	1.499s
PB-212	477.10	238.70	334.	526.	0.263	19.43	1.499
PB-214	590.41	295.33	158.	104.	0.052	58.21	1.499
AC-228	676.59	338.40	129.	110.	0.055	51.07	1.499
PB-214	703.64	351.92	121.	187.	0.094	32.82	1.499
SB-125	926.14	463.12	65.	49.	0.025	78.88	1.499
TL-208	1023.07	511.56	90.	70.	0.035	63.01	0.861s
TL-208	1166.05	583.02	65.	207.	0.103	27.93	1.407
BI-214	1218.50	609.23	73.	137.	0.069	41.07	1.496
CS-137	1323.17	661.54	43.	185.	0.093	28.68	1.657s
AC-228	1822.30	910.98	22.	112.	0.056	32.65	1.578
AC-228	1937.84	968.71	51.	57.	0.029	65.24	1.616s
BI-214	2241.06	1120.24	22.	41.	0.021	73.14	0.792s
K-40	2921.84	1460.41	5.	502.	0.251	13.48	1.904s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
BI-214	3528.63	1763.60	4.	31.	0.016	62.81	1.045s

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

Nuclide Name	Code	Average Activity pCi/gm	Peak Energy keV	Activity pCi/gm	Code	MDA Value pCi/gm	COMMENTS
BE-7		1.5290E-02					
			477.56	1.529E-02	&(	3.457E-01 9.79E-02	G
K-40		1.2429E+01					
			1460.75	1.243E+01	@(P	3.219E-01 5.61E-01	G
MN-54		-8.6171E-04					
			834.81	-8.617E-04	%(P	4.637E-02 1.27E-02	G
CO-57		-1.7255E-03					
			122.07	-1.725E-03	%(	4.888E-02 1.45E-02	G K
			136.43	-3.222E-03	%	3.683E-01 1.09E-01	G
CO-60		7.4805E-03					
			1332.51	7.480E-03	%(P	3.862E-02 1.06E-02	G K
			1173.23	3.425E-02	% P	7.209E-02 2.18E-02	G K
Sr-85		-1.4636E-02					
			514.00	-1.464E-02	&(	5.514E-02 1.63E-02	G
Kr-85		-3.6370E+02					
			513.99	-3.637E+02	&(P	1.270E+03 3.75E+02	G
Y-88		-8.9310E-03					
			1836.01	-8.931E-03	%(	5.350E-02 1.46E-02	G K
			898.02	-1.406E-04	% P	4.197E-02 1.12E-02	G
NB-94		-2.0807E-03					
			871.10	-2.081E-03	&(P	5.564E-02 1.56E-02	G K
			702.50	-8.993E-03	% P	4.935E-02 1.43E-02	G K
Ag-108M		-3.9223E-03					
			722.95	-3.922E-03	%(	5.038E-02 1.42E-02	G K
			614.37	-9.164E-03	% P	5.911E-02 1.72E-02	G
			433.93	1.905E-03	%	4.710E-02 1.36E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CD-109	8.9910E-01						
		88.04	8.991E-01	%(P	1.340E+00	4.10E-01	G
SN-113	5.9439E-03						
		391.71	5.944E-03	%(	5.694E-02	1.65E-02	G K
		255.04	-4.913E-01	& P	2.029E+00	6.05E-01	G
SB-125	1.1860E-01						
		427.95	2.566E-03	&(P	1.114E-01	3.15E-02	G K
		600.77	-3.347E-02	% P	2.360E-01	6.77E-02	G
		636.15	-1.950E-02	& P	3.789E-01	1.06E-01	G
		463.51	4.620E-01	(P	3.778E-01	1.25E-01	G
		176.29	-1.390E-01	% P	5.950E-01	1.77E-01	G
I-131	4.7801E-03						
		364.48	4.780E-03	%(	5.219E-02	1.52E-02	G K
		636.97	-1.069E-01	&	6.472E-01	1.87E-01	G
		284.29	1.638E-01	%	6.149E-01	1.83E-01	G
CS-134	1.5930E-03						
		604.66	1.593E-03	&(P	4.628E-02	1.31E-02	G K
		795.76	-4.644E-03	% P	5.992E-02	1.68E-02	G
		569.29	9.917E-02	% P	2.819E-01	8.38E-02	G
		801.84	-3.699E-02	%	4.874E-01	1.36E-01	G
CS-137	2.8715E-01						
		661.62	2.871E-01	*(P	5.154E-02	2.76E-02	G
CE-139	1.0565E-02						
		165.85	1.057E-02	%(P	4.117E-02	1.23E-02	G
EU-152	-1.1594E-02						
		121.78	-1.159E-02	%(P	1.404E-01	4.17E-02	G K
		344.30	-3.799E-02	% P	1.459E-01	4.31E-02	G
		1408.08	6.369E-02	% P	1.754E-01	5.12E-02	G
		964.00	3.600E-02	% P	3.003E-01	8.31E-02	G
		1112.07	1.521E-01	% P	3.788E-01	1.13E-01	G
		778.90	-4.820E-02	% P	3.601E-01	1.02E-01	G
EU-154	5.4085E-03						
		123.10	5.409E-03	%(P	9.867E-02	2.93E-02	G K
		1274.80	-6.534E-03	% P	1.653E-01	4.52E-02	G
		723.30	-3.564E-02	& P	2.986E-01	8.58E-02	G
		1004.80	9.016E-02	& P	2.735E-01	8.04E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
EU-155	8.9228E-02						
		86.45	8.923E-02	%(	1.711E-01	5.20E-02	G K
		105.31	3.365E-02	%	2.035E-01	6.08E-02	G
HG-203	1.7733E-04						
		279.17	1.773E-04	%(	5.104E-02	1.49E-02	G K
		72.87	3.458E-03	% P	1.372E+00	4.10E-01	G
		70.83	1.819E-01	%	2.002E+00	5.98E-01	G
		82.50	-6.965E-01	&	2.560E+00	7.70E-01	G
TL-208	2.8873E-01						
		583.14	2.802E-01	(P	5.471E-02	2.64E-02	G
		510.72	3.211E-01	*(P	2.137E-01	8.28E-02	G
PB-212	6.0420E-01						
		238.63	6.108E-01	(P	1.020E-01	4.00E-02	G K
							Energy duplication
		77.11	6.060E-01	(	3.358E-01	1.07E-01	G
		74.81	5.713E-01	&(P	6.842E-01	2.10E-01	G
PB-214	3.4799E-01						
		351.99	3.597E-01	(P	1.039E-01	3.98E-02	G K
		295.22	3.253E-01	(P	1.925E-01	6.42E-02	G
							Energy duplication
		77.11	9.754E-01	+ P	5.505E-01	1.76E-01	G
		241.92	7.442E-02	% P	6.784E-01	2.01E-01	G
BI-212	2.7225E-01						
		727.17	2.723E-01	%(P	4.181E-01	1.30E-01	G K
		1620.56	4.399E-01	%	1.701E+00	4.80E-01	G
		785.42	6.704E-01	& P	2.005E+00	5.89E-01	G
BI-214	3.6254E-01						
		609.32	3.625E-01	(P	1.118E-01	5.00E-02	G K
		1764.51	6.207E-01	+ P	2.264E-01	1.32E-01	G
		1120.28	5.728E-01	+ P	3.429E-01	1.41E-01	G
RA-224	7.0238E-01						
		241.00	7.024E-01	%(P	1.248E+00	3.80E-01	G
RA-226	8.2144E-01						
		185.99	8.214E-01	%(	1.188E+00	3.65E-01	G
AC-228	6.4573E-01						
		911.07	6.763E-01	(P	1.474E-01	7.48E-02	G K
		968.90	6.059E-01	*(P	3.815E-01	1.33E-01	G
		338.40	6.299E-01	(P	3.180E-01	1.09E-01	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments

TH-227      -1.1518E-01
                          236.00-1.152E-01 %(P 4.689E-01 1.40E-01 G K
                          256.25-7.615E-03 % P 5.849E-01 1.71E-01 G

PA-234      -2.1706E-03
                           98.44-2.171E-03 &(  1.742E-01 5.17E-02 G K
                          946.00-1.028E-03 &   1.909E-01 5.06E-02 G
                          131.28-8.191E-03 &   2.196E-01 6.52E-02 G
                           94.67-1.599E-02 %   3.135E-01 9.33E-02 G
                          883.24 5.309E-02 %   4.501E-01 1.28E-01 G
                          926.70-3.991E-02 &   4.489E-01 1.26E-01 G
                          569.26 1.516E-01 %   4.166E-01 1.24E-01 G

TH-234       1.0309E+00
                           63.29 4.074E-01 &(P 2.207E+00 6.59E-01 G K
                           92.80 1.402E+00  (P 1.626E+00 5.00E-01 G
                           92.38 1.544E+00 &(P 1.955E+00 5.99E-01 G

AM-241      -4.8049E-02
                           59.54-4.805E-02 &(P 3.037E-01 9.07E-02 G
   ( - This peak used in the nuclide activity average.

   * - Peak is too wide, but only one peak in library.
   ! - Peak is part of a multiplet and this area went
       negative during deconvolution.
   ? - Peak is too narrow.
   @ - Peak is too wide at FW25M, but ok at FWHM.
   % - Peak fails sensitivity test.
   $ - Peak identified, but first peak of this nuclide
       failed one or more qualification tests.
   + - Peak activity higher than counting uncertainty range.
   - - Peak activity lower than counting uncertainty range.
   = - Peak outside analysis energy range.
   & - Calculated peak centroid is not close enough to the
       library energy centroid for positive identification.
   P - Peakbackground subtraction
   } - Peak is too close to another for the activity
       to be found directly.

   Nuclide Codes:                      Peak Codes:
   T - Thermal Neutron Activation      G - Gamma Ray
   F - Fast Neutron Activation         X - X-Ray
   I - Fission Product                 P - Positron Decay
   N - Naturally Occurring Isotope     S - Single-Escape
   P - Photon Reaction                 D - Double-Escape
   C - Charged Particle Reaction       K - Key Line
   M - No MDA Calculation              A - Not in Average
```

R - Coincidence Corrected C - Coincidence Peak
H - Halflife limit exceeded

- -

***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	1.5151E-02	1.5290E-02	2.9369E-01	2.9369E-01	3.426E-01
K-40	#	1.2429E+01	1.2429E+01	1.6832E+00	1.8238E+00	
MN-54	#A	-8.6038E-04	-8.6171E-04	3.1980E-01	3.1980E-01	4.630E-02
CO-57	#B	-1.7224E-03	-1.7255E-03	4.3512E-02	4.3512E-02	4.879E-02
CO-60	#B	7.4786E-03	7.4805E-03	3.1761E-02	3.1763E-02	3.861E-02
Sr-85	#A	-1.4527E-02	-1.4636E-02	4.9045E-02	4.9052E-02	5.473E-02
Kr-85	#A	-3.6370E+02	-3.6370E+02	1.3132E+03	1.3134E+03	1.270E+03
Y-88	#B	-8.8904E-03	-8.9310E-03	4.3720E-02	4.3723E-02	5.326E-02
NB-94	#B	-2.0807E-03	-2.0807E-03	5.8043E-02	5.8043E-02	5.564E-02
Ag-108M	#B	-3.9223E-03	-3.9223E-03	4.2643E-02	4.2643E-02	5.038E-02
CD-109	#A	8.9814E-01	8.9910E-01	1.2293E+00	1.2303E+00	1.339E+00
SN-113	#B	5.9189E-03	5.9439E-03	4.9460E-02	4.9461E-02	5.670E-02
SB-125	#F	1.1854E-01	1.1860E-01	9.6281E-02	9.6514E-02	1.113E-01
I-131	#B	4.5002E-03	4.7801E-03	4.5591E-02	4.5591E-02	4.913E-02
CS-134	#B	1.5920E-03	1.5930E-03	3.9204E-02	3.9204E-02	4.625E-02
CS-137	#	2.8714E-01	2.8715E-01	8.2750E-02	8.4325E-02	
CE-139	#A	1.0528E-02	1.0565E-02	3.6892E-02	3.6896E-02	4.102E-02
EU-152	#B	-1.1592E-02	-1.1594E-02	1.4838E-01	1.4838E-01	1.403E-01
EU-154	#B	5.4077E-03	5.4085E-03	8.7796E-02	8.7796E-02	9.865E-02
EU-155	#B	8.9204E-02	8.9228E-02	1.5597E-01	1.5605E-01	1.711E-01
HG-203	#B	1.7549E-04	1.7733E-04	4.4733E-02	4.4733E-02	5.052E-02
TL-208		2.8873E-01	2.8873E-01	8.1564E-02	8.3179E-02	
PB-212	#	6.0420E-01	6.0420E-01	1.1875E-01	1.2356E-01	1.020E-01
PB-214	#	3.4799E-01	3.4799E-01	1.1543E-01	1.1710E-01	1.039E-01
BI-212	#B	2.7225E-01	2.7225E-01	3.8970E-01	3.9000E-01	4.181E-01
BI-214		3.6254E-01	3.6254E-01	1.5008E-01	1.5147E-01	
RA-224	#A	7.0238E-01	7.0238E-01	1.1404E+00	1.1411E+00	1.248E+00
RA-226	#A	8.2144E-01	8.2144E-01	1.0937E+00	1.0947E+00	1.188E+00
AC-228	#	6.4573E-01	6.4573E-01	1.9466E-01	1.9805E-01	1.474E-01
TH-227	#B	-1.1518E-01	-1.1518E-01	4.3558E-01	4.3563E-01	4.689E-01
PA-234	#B	-2.1706E-03	-2.1706E-03	1.5495E-01	1.5495E-01	1.742E-01
TH-234	#B	1.0309E+00	1.0309E+00	1.1036E+00	1.1050E+00	2.207E+00
AM-241	#A	-4.8049E-02	-4.8049E-02	2.9848E-01	2.9849E-01	3.037E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.

H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (269.6 to 1999.1 keV) 1.3367285E+01 pCi/gm
Total Decayed Activity (269.6 to 1999.1 keV) 1.3367297E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JPK

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 101F_24AUG2006_0928.An1

Sample description
FSS-OOL-05-04-090-F-I

Spectrum Filename: C:\GammaVision\Spectra\101F_24AUG2006_0928.An1

Acquisition information
Start time: 24-Aug-2006 09:27:59
Live time: 2000
Real time: 2003
Dead time: 0.13 %
Detector ID: 1

Detector system
Det 101- DSPE-633

Calibration
Filename: D1_1LSa.Clb
Detector 101 1.0 Liter Marinelli Sand

Energy Calibration
Created: 03-Sep-2004 08:50:48
Zero offset: 0.244 keV
Gain: 0.500 keV/channel
Quadratic: -2.493E-08 keV/channel^2

Efficiency Calibration
Created: 03-Sep-2004 08:52:26
Type: Polynomial
Uncertainty: 0.626 %
Coefficients: -0.321775 -5.816463 0.734234
-0.099357 0.006049 -0.000149

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.23keV)
Stop channel: 4000 (1999.11keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 1.7980E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.7980E+03) =
5.5617E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	23-Aug-2006 16:25:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	101_150K_28APR05.Pbc 01-May-2005 05:24:47
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 20 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.1196

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
74.43	227.	16.53	1.00	1.651E-02	74.81	9.600	1.051E+00	PB212
77.19	528.	7.12	1.01	1.730E-02	77.11	10.700	2.139E+00	PB214
					77.11	17.500	1.317E+00	PB212
87.73	128.	26.23	1.01	1.930E-02				
87.73	128.	26.23	1.01	1.930E-02	88.04	3.790	PBC<MDA	CD109
89.76	146.	21.36	1.02	1.956E-02				
93.05	166.	19.04	1.02	1.993E-02	92.38	2.570	2.291E+00	TH234
					92.80	3.000	2.017E+00	TH234
128.75	104.	39.99	0.97	2.110E-02				
185.96	178.	24.54	1.60	1.858E-02				
185.96	178.	24.54	1.60	1.858E-02	185.99	3.280	2.192E+00	RA226
209.53	108.	27.25	1.09	1.720E-02				
238.74	988.	3.78	1.12	1.557E-02	238.63	43.100	1.100E+00	PB212
241.71	150.	17.77	1.12	1.541E-02	241.00	3.900	1.857E+00	RA224
					241.92	7.470	9.728E-01	PB214
269.98	108.	27.83	1.10	1.402E-02				
295.35	198.	10.68	1.16	1.292E-02	295.22	19.200	5.956E-01	PB214
299.98	65.	24.69	1.16	1.273E-02				
327.98	65.	32.49	1.26	1.170E-02				
338.37	237.	12.42	1.32	1.135E-02	338.40	12.010	1.295E+00	AC228
352.07	330.	9.00	0.96	1.092E-02	351.99	37.100	6.083E-01	PB214
463.19	76.	24.48	1.41	8.347E-03				
463.19	76.	24.48	1.41	8.347E-03	463.51	10.000	6.721E-01	SB125
510.51	141.	16.24	1.87	7.594E-03	510.72	22.500	5.504E-01	TL208
583.13	366.	7.67	1.41	6.685E-03	583.14	86.000	4.754E-01	TL208
609.16	222.	9.84	1.46	6.414E-03	609.32	46.090	5.607E-01	BI214
726.77	65.	24.83	1.72	5.446E-03	727.17	11.800	7.480E-01	BI212

767.98	27.	37.22	1.49	5.179E-03				
794.99	35.	35.08	1.50	5.016E-03	795.76	85.400	PBC<MDA	CS134
911.03	242.	10.21	1.51	4.447E-03	911.07	29.000	1.401E+00	AC228
964.40	39.	37.83	1.61	4.231E-03	964.00	14.580	PBC<MDA	EU152
967.69	159.	10.84	1.80	4.217E-03	968.90	17.460	1.618E+00	AC228
1119.96	80.	23.75	1.38	3.712E-03	1120.28	15.040	1.078E+00	BI214
1460.51	672.	3.94	2.03	2.943E-03	1460.75	10.700	1.599E+01	K40
1764.30	53.	15.21	1.36	2.481E-03	1764.51	15.920	1.000E+00	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide
175.05	87.84	495.	128.	0.064	78.68	1.014	PB-214 lD
179.11	89.87	417.	146.	0.073	64.09	1.016	PB-214 lD
257.11	128.75	710.	104.	0.052	112.37	0.967	AC-228
418.74	209.53	343.	108.	0.054	81.75	1.089	AC-228 s
539.69	269.98	298.	108.	0.054	83.49	1.098	AC-228 s
599.50	299.88	195.	81.	0.041	88.31	1.040	TH-227 M
655.74	327.98	165.	65.	0.032	97.47	1.255	AC-228 s
1536.16	767.98	37.	27.	0.014	111.67	1.489	BI-214 M

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.
M - Peak is close to a library peak.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-212	149.19	74.81	495.	264.	0.132	39.31	1.005D
PB-212	153.79	77.11	502.	450.	0.225	24.37	1.006A
TH-234	186.00	93.21	1067.	170.	0.085	79.51	1.499s
TH-234	185.91	93.16	1105.	176.	0.088	80.54	1.499s
RA-226	371.81	186.08	636.	172.	0.086	66.20	1.499s
PB-212	476.96	238.63	218.	979.	0.489	11.43	1.122D
RA-224	481.61	240.95	224.	101.	0.051	68.74	1.499
PB-214	483.54	241.92	214.	135.	0.068	52.36	1.124D
PB-214	590.23	295.24	275.	216.	0.108	42.69	1.320
AC-228	676.53	338.37	212.	235.	0.117	37.27	1.320s
PB-214	703.93	352.07	186.	328.	0.164	27.00	0.957
SB-125	925.89	463.00	114.	66.	0.033	75.55	1.499
TL-208	1020.96	510.51	140.	125.	0.063	48.73	1.867s
TL-208	1166.26	583.13	119.	364.	0.182	23.00	1.405
BI-214	1218.36	609.16	89.	220.	0.110	29.51	1.461
BI-212	1453.70	726.77	72.	64.	0.032	74.50	1.720
CS-134	1590.21	794.99	59.	35.	0.017	105.23	1.502s
AC-228	1822.41	911.03	88.	240.	0.120	30.62	1.505
EU-152	1929.20	964.40	93.	39.	0.020	113.50	1.612s
AC-228	1935.79	967.69	47.	158.	0.079	32.52	1.796s
BI-214	2240.51	1119.96	65.	80.	0.040	71.25	1.382s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
K-40	2922.05	1460.51	12.	670.	0.335	11.83	2.027
BI-214	3530.04	1764.30	3.	53.	0.026	45.64	1.365s

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	Peak MDA Value pCi/gm	COMMENTS
BE-7		6.6290E-02					
			477.56	6.629E-02	&(	4.009E-01 1.17E-01	G
K-40		1.5987E+01					
			1460.75	1.599E+01	(P	4.545E-01 6.32E-01	G
MN-54		2.7455E-03					
			834.81	2.746E-03	%(P	7.178E-02 2.06E-02	G
CO-57		-1.1751E-02					
			122.07	-1.175E-02	%(	6.188E-02 1.86E-02	G K
			136.43	7.255E-04	%	4.048E-01 1.20E-01	G
CO-60		1.1248E-02					
			1332.51	1.125E-02	%(P	5.462E-02 1.55E-02	G K
			1173.23	-1.632E-02	& P	8.232E-02 2.39E-02	G K
Sr-85		-2.3413E-02					
			514.00	-2.341E-02	%(	6.751E-02 2.02E-02	G
Kr-85		-5.4645E+02					
			513.99	-5.464E+02	%(P	1.527E+03 4.56E+02	G
Y-88		8.6360E-03					
			1836.01	8.636E-03	%(	3.177E-02 8.76E-03	G K
			898.02	1.997E-02	% P	4.909E-02 1.47E-02	G
NB-94		-2.1660E-04					
			871.10	-2.166E-04	&(P	5.567E-02 1.55E-02	G K
			702.50	7.873E-03	% P	5.577E-02 1.62E-02	G K
Ag-108M		-1.9090E-02					
			722.95	-1.909E-02	%(	7.663E-02 2.27E-02	G K
			614.37	1.736E-03	% P	4.698E-02 1.33E-02	G
			433.93	7.502E-03	%	4.922E-02 1.44E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CD-109	-5.9495E-02						
		88.04	-5.950E-02	%(P	1.803E+00	5.39E-01	G
SN-113	1.2484E-02						
		391.71	1.248E-02	%(	7.029E-02	2.07E-02	G K
		255.04	-1.746E-01	& P	2.184E+00	6.45E-01	G
SB-125	1.2041E-01						
		427.95	-4.139E-02	%(P	1.610E-01	4.77E-02	G K
		600.77	-3.753E-02	% P	2.951E-01	8.56E-02	G
		636.15	-1.098E-01	% P	5.047E-01	1.48E-01	G
		463.51	5.993E-01	(P	4.726E-01	1.54E-01	G
		176.29	-3.517E-02	& P	6.153E-01	1.82E-01	G
I-131	-1.9830E-03						
		364.48	-1.983E-03	&(	6.110E-02	1.78E-02	G K
		636.97	-1.280E-01	%	7.536E-01	2.19E-01	G
		284.29	-1.439E-01	%	7.845E-01	2.33E-01	G
CS-134	3.7396E-02						
		604.66	1.657E-02	%(P	3.169E-02	9.67E-03	G K
		795.76	6.120E-02	(P	6.778E-02	2.17E-02	G
		569.29	-1.530E-02	& P	3.631E-01	1.05E-01	G
		801.84	0.000E+00	&	7.898E-01	2.25E-01	G
CS-137	2.6985E-04						
		661.62	2.699E-04	%(P	7.902E-02	2.27E-02	G
CE-139	-1.1024E-03						
		165.85	-1.102E-03	%(P	6.183E-02	1.84E-02	G
EU-152	1.3636E-01						
		121.78	-3.346E-02	%(P	1.789E-01	5.36E-02	G K
		344.30	-1.997E-02	& P	1.612E-01	4.72E-02	G
		1408.08	4.939E-02	% P	2.237E-01	6.29E-02	G
		964.00	4.769E-01	&(P	5.803E-01	1.83E-01	G
		1112.07	-9.484E-02	% P	5.109E-01	1.47E-01	G
		778.90	-8.143E-02	% P	4.719E-01	1.37E-01	G
EU-154	-1.6892E-03						
		123.10	-1.689E-03	%(P	1.292E-01	3.85E-02	G K
		1274.80	-2.529E-02	& P	2.213E-01	6.32E-02	G
		723.30	-9.665E-02	% P	3.551E-01	1.05E-01	G
		1004.80	2.361E-02	& P	3.223E-01	9.05E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
EU-155	1.4080E-02						
		86.45	1.408E-02	%(	2.222E-01	6.66E-02	G K
		105.31	6.745E-02	%	2.451E-01	7.38E-02	G
HG-203	-1.3741E-03						
		279.17	-1.374E-03	%(	5.634E-02	1.66E-02	G K
		72.87	-5.886E-01	& P	1.490E+00	4.50E-01	G
		70.83	-1.519E-02	%	2.998E+00	8.98E-01	G
		82.50	1.872E-01	&	2.567E+00	7.66E-01	G
TL-208	4.9096E-01						
		583.14	4.754E-01	(P	7.011E-02	3.67E-02	G
		510.72	5.504E-01	*(P	2.545E-01	1.01E-01	G
PB-212	1.1242E+00						
		238.63	1.096E+00	(P	8.001E-02	4.20E-02	G K
							Energy duplication
		77.11	1.124E+00	}	2.673E-01	9.13E-02	G
		74.81	1.251E+00	(P	5.034E-01	1.67E-01	G
PB-214	6.2352E-01						
		351.99	6.083E-01	(P	1.229E-01	5.51E-02	G K
		295.22	6.530E-01	(P	2.425E-01	9.37E-02	G
							Energy duplication
		77.11	0.000E+00	} P	6.467E-01	0.00E+00	G
		241.92	8.830E-01	+ P	4.629E-01	1.55E-01	G
BI-212	7.4802E-01						
		727.17	7.480E-01	(P	4.947E-01	1.88E-01	G K
		1620.56	0.000E+00	&	2.603E+00	7.06E-01	G
		785.42	1.150E+00	% P	2.749E+00	8.26E-01	G
BI-214	5.6069E-01						
		609.32	5.607E-01	(P	1.184E-01	5.54E-02	G K
		1764.51	1.000E+00	+ P	2.159E-01	1.53E-01	G
		1120.28	1.078E+00	+ P	5.424E-01	2.57E-01	G
RA-224	1.2658E+00						
		241.00	1.266E+00	(P	9.033E-01	2.92E-01	G
RA-226	2.1243E+00						
		185.99	2.124E+00	(	1.483E+00	4.69E-01	G
AC-228	1.4437E+00						
		911.07	1.401E+00	(P	2.701E-01	1.44E-01	G K
		968.90	1.618E+00	@(P	3.532E-01	1.76E-01	G
		338.40	1.295E+00	@(P	3.892E-01	1.62E-01	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments

TH-227      -1.2134E-01
                          236.00-1.213E-01 %(P 5.540E-01 1.66E-01 G K
                          256.25 1.464E-01 % P 6.621E-01 1.97E-01 G

PA-234       1.0274E-01
                           98.44 1.027E-01 %(  2.135E-01 6.47E-02 G K
                          946.00-3.000E-02 %   2.758E-01 7.82E-02 G
                          131.28 0.000E+00 &   2.548E-01 7.59E-02 G
                           94.67-1.900E-01 %   4.086E-01 1.24E-01 G
                          883.24 8.578E-02 %   3.807E-01 1.10E-01 G
                          926.70 1.568E-01 %   5.017E-01 1.48E-01 G
                          569.26-1.637E-02 &   5.371E-01 1.55E-01 G

TH-234       1.7740E+00
                           63.29 9.586E-01 %(P 2.543E+00 7.67E-01 G K
                           92.80 2.210E+00  (P 1.985E+00 6.14E-01 G
                           92.38 2.502E+00  (P 2.282E+00 7.05E-01 G

AM-241      -1.2333E-01
                           59.54-1.233E-01 &(P 3.551E-01 1.07E-01 G
   ( - This peak used in the nuclide activity average.

   * - Peak is too wide, but only one peak in library.
   ! - Peak is part of a multiplet and this area went
       negative during deconvolution.
   ? - Peak is too narrow.
   @ - Peak is too wide at FW25M, but ok at FWHM.
   % - Peak fails sensitivity test.
   $ - Peak identified, but first peak of this nuclide
       failed one or more qualification tests.
   + - Peak activity higher than counting uncertainty range.
   - - Peak activity lower than counting uncertainty range.
   = - Peak outside analysis energy range.
   & - Calculated peak centroid is not close enough to the
       library energy centroid for positive identification.
   P - Peakbackground subtraction
   } - Peak is too close to another for the activity
       to be found directly.

   Nuclide Codes:                      Peak Codes:
   T - Thermal Neutron Activation      G - Gamma Ray
   F - Fast Neutron Activation         X - X-Ray
   I - Fission Product                 P - Positron Decay
   N - Naturally Occurring Isotope     S - Single-Escape
   P - Photon Reaction                 D - Double-Escape
   C - Charged Particle Reaction       K - Key Line
   M - No MDA Calculation              A - Not in Average
```

R - Coincidence Corrected C - Coincidence Peak
H - Halflife limit exceeded

- -

***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	6.5681E-02	6.6290E-02	3.5036E-01	3.5038E-01	3.972E-01
K-40		1.5987E+01	1.5987E+01	1.8975E+00	2.1015E+00	
MN-54	#A	2.7412E-03	2.7455E-03	6.1726E-02	6.1726E-02	7.167E-02
CO-57	#B	-1.1730E-02	-1.1751E-02	5.5709E-02	5.5713E-02	6.177E-02
CO-60	#B	1.1245E-02	1.1248E-02	4.6506E-02	4.6510E-02	5.461E-02
Sr-85	#A	-2.3236E-02	-2.3413E-02	6.0749E-02	6.0763E-02	6.700E-02
Kr-85	#A	-5.4644E+02	-5.4645E+02	1.5123E+03	1.5126E+03	1.527E+03
Y-88	#B	8.5962E-03	8.6360E-03	2.6294E-02	2.6299E-02	3.162E-02
NB-94	#B	-2.1660E-04	-2.1660E-04	1.2428E-02	1.2428E-02	5.567E-02
Ag-108M	#B	-1.9090E-02	-1.9090E-02	6.7972E-02	6.7981E-02	7.663E-02
CD-109	#A	-5.9431E-02	-5.9495E-02	1.9022E+00	1.9022E+00	1.801E+00
SN-113	#B	1.2431E-02	1.2484E-02	6.2134E-02	6.2138E-02	6.999E-02
SB-125	#B	1.2035E-01	1.2041E-01	9.2951E-02	9.3200E-02	1.609E-01
I-131	#B	-1.8652E-03	-1.9830E-03	5.3483E-02	5.3483E-02	5.747E-02
CS-134	#F	3.7372E-02	3.7396E-02	3.8313E-02	3.8371E-02	3.167E-02
CS-137	#A	2.6984E-04	2.6985E-04	6.8148E-02	6.8148E-02	7.902E-02
CE-139	#A	-1.0985E-03	-1.1024E-03	7.3394E-02	7.3394E-02	6.161E-02
EU-152	#B	1.3635E-01	1.3636E-01	1.5659E-01	1.5677E-01	1.789E-01
EU-154	#B	-1.6890E-03	-1.6892E-03	3.2393E-01	3.2393E-01	1.291E-01
EU-155	#B	1.4077E-02	1.4080E-02	1.9972E-01	1.9973E-01	2.222E-01
HG-203	#B	-1.3597E-03	-1.3741E-03	4.9691E-02	4.9691E-02	5.575E-02
TL-208		4.9096E-01	4.9096E-01	1.1365E-01	1.1698E-01	
PB-212		1.1242E+00	1.1242E+00	1.2930E-01	1.4406E-01	
PB-214		6.2352E-01	6.2352E-01	1.5868E-01	1.6255E-01	
BI-212		7.4802E-01	7.4802E-01	5.6321E-01	5.6480E-01	
BI-214		5.6069E-01	5.6069E-01	1.6628E-01	1.6927E-01	
RA-224		1.2658E+00	1.2658E+00	8.7626E-01	8.7917E-01	9.033E-01
RA-226	#	2.1243E+00	2.1243E+00	1.4062E+00	1.4114E+00	1.483E+00
AC-228		1.4437E+00	1.4437E+00	2.8203E-01	2.9359E-01	
TH-227	#B	-1.2134E-01	-1.2134E-01	5.1386E-01	5.1390E-01	5.540E-01
PA-234	#B	1.0274E-01	1.0274E-01	1.9425E-01	1.9433E-01	2.135E-01
TH-234	#B	1.7740E+00	1.7740E+00	1.4791E+00	1.4824E+00	2.543E+00
AM-241	#A	-1.2333E-01	-1.2333E-01	3.3270E-01	3.3277E-01	3.551E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.

H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (269.6 to 1999.1 keV) 2.2244331E+01 pCi/gm
Total Decayed Activity (269.6 to 1999.1 keV) 2.2244331E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JPK

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 102F_22AUG2006_0927.An1

Sample description
FSS-OOL-05-04-074-F

Spectrum Filename: C:\GammaVision\Spectra\102F_22AUG2006_0927.An1

Acquisition information

Start time:	22-Aug-2006 09:27:31
Live time:	2000
Real time:	2015
Dead time:	0.72 %
Detector ID:	3

Detector system
Det 102 - DSPP-468

Calibration
Filename: D2_1LSa.Clb
DET 102 1 Liter Sand Geometry

Energy Calibration

Created:	15-Jan-2005 03:09:29
Zero offset:	0.220 keV
Gain:	0.500 keV/channel
Quadratic:	-6.435E-08 keV/channel^2

Efficiency Calibration

Created:	15-Jan-2005 06:48:10
Type:	Polynomial
Uncertainty:	0.497 %
Coefficients:	-0.294180 -5.980622 0.744607
	-0.096737 0.005214 -0.000120

Library Files

Main analysis library:	FSS_Rev_1.Lib
Library Match Width:	1.000
Peak stripping:	Library based

Analysis parameters

Analysis engine:	Env32 G53W4.20
Start channel:	100 (50.22keV)
Stop channel:	4000 (1999.02keV)
Peak rejection level:	41.667%
Peak search sensitivity:	3
Sample Size:	1.8650E+03
Activity scaling factor:	1.0000E+06/(1.0000E+00* 1.8650E+03) = 5.3619E+02
Detection limit method:	Nureg 4.16
Random error:	1.0000000E+00
Systematic error:	1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	19-Aug-2006 10:20:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	102_150K_28APR05.Pbc 01-May-2005 05:27:47
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 11 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.5746

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
76.74	150.	25.67	1.14	9.433E-03				
76.74	150.	25.67	1.14	9.433E-03	77.11	10.700	1.062E+00	PB214
					77.11	17.500	6.496E-01	PB212
239.18	331.	9.17	1.07	1.378E-02	238.63	43.100	4.033E-01	PB212
277.00	52.	31.61	0.61	1.216E-02				
295.57	76.	21.02	1.01	1.145E-02	295.22	19.200	2.515E-01	PB214
338.93	74.	23.19	0.88	1.004E-02	338.40	12.010	4.438E-01	AC228
352.33	143.	11.88	1.78	9.669E-03	351.99	37.100	2.878E-01	PB214
463.58	20.	37.59	1.50	7.365E-03	463.51	10.000	PBC<MDA	SB125
511.36	54.	24.74	1.98	6.695E-03	510.72	22.500	2.617E-01	TL208
584.07	83.	15.94	1.03	5.881E-03	583.14	86.000	1.176E-01	TL208
610.37	110.	13.12	1.76	5.640E-03	609.32	46.090	3.064E-01	BI214
912.59	70.	18.27	1.42	3.916E-03	911.07	29.000	4.445E-01	AC228
969.98	67.	17.43	1.66	3.718E-03	968.90	17.460	7.531E-01	AC228
1120.55	28.	29.88	0.55	3.283E-03	1120.28	15.040	4.109E-01	BI214
1330.24	21.	21.82	0.62	2.838E-03				
1462.88	329.	5.56	2.24	2.617E-03	1460.75	10.700	8.500E+00	K40

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

Peak Centroid Channel	Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
477.98	239.18	422.	94.	0.047	97.70	1.068	PB-212	s
553.64	277.00	65.	70.	0.035	60.99	0.610	TL-208	s
2661.17	1330.24	-2.	23.	0.011	58.71	0.625	-	sM

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.
M - Peak is close to a library peak.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-214	153.80	77.11	519.	93.	0.047	108.15	1.500D
PB-212	153.80	77.11	519.	93.	0.047	108.15	1.500D
PB-212	477.75	239.06	212.	207.	0.103	36.45	1.500
PB-214	591.26	295.80	96.	70.	0.035	69.69	1.500s
AC-228	677.54	338.93	76.	74.	0.037	69.56	0.885
PB-214	704.71	352.52	60.	134.	0.067	35.55	1.500s
SB-125	926.91	463.58	24.	20.	0.010	112.78	1.500
TL-208	1022.51	511.36	40.	54.	0.027	74.22	1.984s
TL-208	1167.97	584.07	33.	82.	0.041	47.82	1.031
BI-214	1220.60	610.37	30.	110.	0.055	39.37	1.756
AC-228	1825.32	912.59	26.	70.	0.035	54.82	1.416
AC-228	1940.18	969.98	17.	67.	0.034	52.30	1.661
BI-214	2241.50	1120.55	14.	28.	0.014	89.64	0.552s
K-40	2926.69	1462.89	0.	318.	0.159	16.81	2.042

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	MDA Value pCi/gm	COMMENTS
BE-7		7.0456E-03					
			477.56	7.046E-03	&(	3.035E-01	8.41E-02 G
K-40		8.2193E+00					
			1460.75	8.219E+00	(P	1.904E-01	4.61E-01 G
MN-54		-3.6749E-04					
			834.81	-3.675E-04	&(P	4.677E-02	1.27E-02 G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CO-57	4.4181E-03						
		122.07	4.418E-03	%(	3.251E-02	9.57E-03	G K
		136.43	4.229E-03	%	3.435E-01	1.01E-01	G
CO-60	-7.2643E-03						
		1332.51	-7.264E-03	%(P	5.095E-02	1.40E-02	G K
		1173.23	-4.824E-03	&	5.881E-02	1.63E-02	G K
Sr-85	-5.3429E-03						
		514.00	-5.343E-03	&(	3.647E-02	1.04E-02	G
Kr-85	-1.2670E+02						
		513.99	-1.267E+02	&(	7.804E+02	2.23E+02	G
Y-88	-2.2711E-05						
		1836.01	-2.271E-05	%(P	2.550E-02	3.46E-03	G K
		898.02	-5.294E-03	% P	4.758E-02	1.29E-02	G
NB-94	-6.0985E-03						
		871.10	-6.098E-03	%(	4.190E-02	1.17E-02	G K
		702.50	-1.067E-04	%	3.221E-02	8.58E-03	G K
Ag-108M	1.4133E-03						
		722.95	1.413E-03	%(	3.856E-02	1.04E-02	G K
		614.37	-8.982E-03	% P	4.829E-02	1.39E-02	G
		433.93	5.400E-04	&	2.916E-02	8.04E-03	G
CD-109	4.1474E-01						
		88.04	4.147E-01	%(P	1.218E+00	3.65E-01	G
SN-113	2.3436E-02						
		391.71	2.344E-02	%(	4.209E-02	1.29E-02	G K
		255.04	2.710E-01	&	1.588E+00	4.68E-01	G
SB-125	3.6966E-02						
		427.95	-1.787E-02	%(P	1.129E-01	3.22E-02	G K
		600.77	-4.370E-02	% P	2.435E-01	7.03E-02	G
		636.15	1.043E-01	% P	2.746E-01	8.15E-02	G
		463.51	1.993E-01	(P	2.524E-01	8.07E-02	G
		176.29	1.329E-01	% P	4.673E-01	1.39E-01	G
I-131	0.0000E+00						
		364.48	0.000E+00	%(	5.624E-02	1.61E-02	G K
		636.97	1.656E-01	%	5.743E-01	1.67E-01	G
		284.29	-1.429E-01	&	5.970E-01	1.76E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CS-134	1.0075E-02						
		604.66	1.008E-02	&(	3.221E-02	9.43E-03	G K
		795.76	1.115E-02	%	4.342E-02	1.25E-02	G
		569.29	-3.137E-02	&	2.369E-01	6.73E-02	G
		801.84	-1.389E-03	% P	5.106E-01	1.39E-01	G
CS-137	-3.5294E-05						
		661.62	-3.529E-05	&(	5.200E-02	1.44E-02	G
CE-139	-2.2977E-03						
		165.85	-2.298E-03	%(P	3.833E-02	1.12E-02	G
EU-152	-2.1353E-03						
		121.78	-2.135E-03	%(P	1.222E-01	3.58E-02	G K
		344.30	3.220E-02	%	1.063E-01	3.14E-02	G
		1408.08	-1.279E-02	%	2.243E-01	5.90E-02	G
		964.00	-7.868E-02	% P	3.665E-01	1.05E-01	G
		1112.07	4.721E-02	%	3.574E-01	9.91E-02	G
		778.90	6.226E-02	% P	2.782E-01	7.92E-02	G
EU-154	-2.1805E-04						
		123.10	-2.181E-04	%(P	8.949E-02	2.63E-02	G K
		1274.80	-2.535E-02	%	1.608E-01	4.51E-02	G
		723.30	3.730E-04	% P	1.796E-01	4.81E-02	G
		1004.80	6.539E-02	&	2.573E-01	7.39E-02	G
EU-155	8.8847E-02						
		86.45	8.885E-02	%(P	1.967E-01	5.95E-02	G K
		105.31	6.034E-02	%	1.997E-01	5.99E-02	G
HG-203	-1.4823E-02						
		279.17	-1.482E-02	&(P	4.648E-02	1.39E-02	G K
		72.87	1.271E-02	&	1.524E+00	4.51E-01	G
		70.83	-1.481E-01	%	3.160E+00	9.38E-01	G
		82.50	-4.153E-01	%	2.991E+00	8.90E-01	G
TL-208	1.1757E-01						
		583.14	1.176E-01	(P	4.206E-02	1.89E-02	G
		510.72	2.617E-01	+	1.541E-01	6.48E-02	G
PB-212	2.5199E-01						
		238.63	2.520E-01	(	8.602E-02	3.06E-02	G K
							Energy duplication
		77.11	4.048E-01	+	4.723E-01	1.46E-01	G
		74.81	3.251E-01	& P	9.606E-01	2.89E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
PB-214	2.5590E-01						
		351.99	2.699E-01	@(P	7.810E-02	3.21E-02	G K
		295.22	2.288E-01	@(	1.589E-01	5.32E-02	G
							Energy duplication
		77.11	6.620E-01	+	7.725E-01	2.39E-01	G
		241.92	1.617E-01	%	5.152E-01	1.54E-01	G
BI-212	-1.7824E-02						
		727.17	-1.782E-02	%(	3.676E-01	1.02E-01	G K
		1620.56	-3.688E-02	% P	8.101E-01	1.10E-01	G
		785.42	-1.583E-01	% P	1.786E+00	4.88E-01	G
BI-214	3.3210E-01						
		609.32	3.064E-01	(	7.845E-02	4.03E-02	G K
		1764.51	-5.636E-03	% P	4.041E-01	1.06E-01	G
		1120.28	4.109E-01	(	2.956E-01	1.23E-01	G
RA-224	3.9454E-01						
		241.00	3.945E-01	&(P	9.299E-01	2.80E-01	G
RA-226	4.5781E-01						
		185.99	4.578E-01	%(P	9.717E-01	2.93E-01	G
AC-228	4.4429E-01						
		911.07	4.445E-01	(P	1.693E-01	8.16E-02	G K
		968.90	7.531E-01	+ P	2.418E-01	1.31E-01	G
		338.40	4.438E-01	(	2.599E-01	1.03E-01	G
TH-227	-7.4298E-02						
		236.00	-7.430E-02	%(P	3.585E-01	1.07E-01	G K
		256.25	6.642E-02	%	4.828E-01	1.42E-01	G
PA-234	3.9664E-03						
		98.44	3.966E-03	&(	1.960E-01	5.79E-02	G K
		946.00	-1.767E-04	%	2.337E-01	6.31E-02	G
		131.28	-2.041E-02	&	1.754E-01	5.19E-02	G
		94.67	-7.692E-02	%	3.884E-01	1.16E-01	G
		883.24	4.959E-02	%	3.507E-01	9.80E-02	G
		926.70	6.628E-03	%	3.819E-01	1.02E-01	G
		569.26	-4.677E-02	&	3.505E-01	9.96E-02	G
TH-234	1.0774E+00						
		63.29	1.077E+00	%(P	3.706E+00	1.11E+00	G K
		92.80	7.123E-01	%	1.991E+00	6.00E-01	G
		92.38	7.237E-01	% P	2.392E+00	7.19E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
AM-241	-6.5660E-02						
		59.54	-6.566E-02	%(	5.784E-01	1.72E-01	G

(- This peak used in the nuclide activity average.

* - Peak is too wide, but only one peak in library.
! - Peak is part of a multiplet and this area went negative during deconvolution.
? - Peak is too narrow.
@ - Peak is too wide at FW25M, but ok at FWHM.
% - Peak fails sensitivity test.
$ - Peak identified, but first peak of this nuclide failed one or more qualification tests.
+ - Peak activity higher than counting uncertainty range.
- - Peak activity lower than counting uncertainty range.
= - Peak outside analysis energy range.
& - Calculated peak centroid is not close enough to the library energy centroid for positive identification.
P - Peakbackground subtraction
} - Peak is too close to another for the activity to be found directly.

Nuclide Codes:	Peak Codes:
T - Thermal Neutron Activation	G - Gamma Ray
F - Fast Neutron Activation	X - X-Ray
I - Fission Product	P - Positron Decay
N - Naturally Occurring Isotope	S - Single-Escape
P - Photon Reaction	D - Double-Escape
C - Charged Particle Reaction	K - Key Line
M - No MDA Calculation	A - Not in Average
R - Coincidence Corrected	C - Coincidence Peak
H - Halflife limit exceeded	

- -

***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	6.7797E-03	7.0456E-03	2.5235E-01	2.5235E-01	2.920E-01
K-40		8.2193E+00	8.2193E+00	1.3825E+00	1.4574E+00	1.904E-01
MN-54	#A	-3.6508E-04	-3.6749E-04	1.6291E-02	1.6291E-02	4.646E-02
CO-57	#B	4.3846E-03	4.4181E-03	2.8698E-02	2.8699E-02	3.226E-02
CO-60	#B	-7.2566E-03	-7.2643E-03	4.4308E-02	4.4310E-02	5.090E-02
Sr-85	#A	-5.1763E-03	-5.3429E-03	3.1296E-02	3.1298E-02	3.534E-02
Kr-85	#A	-1.2670E+02	-1.2670E+02	6.6989E+02	6.6993E+02	7.803E+02
Y-88	#B	-2.2278E-05	-2.2711E-05	1.3627E-04	1.3627E-04	2.502E-02
NB-94	#B	-6.0985E-03	-6.0985E-03	3.5181E-02	3.5182E-02	4.190E-02
Ag-108M	#B	1.4132E-03	1.4133E-03	3.1349E-02	3.1349E-02	3.856E-02
CD-109	#A	4.1286E-01	4.1474E-01	1.0959E+00	1.0961E+00	1.213E+00

SN-113	#B	2.3022E-02	2.3436E-02	3.8834E-02	3.8856E-02	4.135E-02
SB-125	#B	3.6891E-02	3.6966E-02	4.4881E-02	4.4928E-02	1.127E-01
I-131	#B	0.0000E+00	0.0000E+00	4.8168E-02	4.8168E-02	4.356E-02
CS-134	#B	1.0048E-02	1.0075E-02	2.8277E-02	2.8283E-02	3.212E-02
CS-137	#A	-3.5288E-05	-3.5294E-05	4.3307E-02	4.3307E-02	5.199E-02
CE-139	#A	-2.2636E-03	-2.2977E-03	4.1398E-02	4.1399E-02	3.776E-02
EU-152	#B	-2.1343E-03	-2.1353E-03	4.3768E-01	4.3768E-01	1.221E-01
EU-154	#B	-2.1791E-04	-2.1805E-04	3.2386E-02	3.2386E-02	8.943E-02
EU-155	#B	8.8746E-02	8.8847E-02	1.7842E-01	1.7849E-01	1.965E-01
HG-203	#B	-1.4184E-02	-1.4823E-02	4.2052E-02	4.2060E-02	4.447E-02
TL-208		1.1757E-01	1.1757E-01	5.6497E-02	5.6881E-02	
PB-212	#	2.5199E-01	2.5199E-01	9.1838E-02	9.2920E-02	8.602E-02
PB-214	#	2.5590E-01	2.5590E-01	9.1238E-02	9.2361E-02	7.810E-02
BI-212	#B	-1.7824E-02	-1.7824E-02	3.0643E-01	3.0643E-01	3.676E-01
BI-214		3.3210E-01	3.3210E-01	1.3075E-01	1.3207E-01	
RA-224	#A	3.9454E-01	3.9454E-01	8.4111E-01	8.4141E-01	9.299E-01
RA-226	#A	4.5781E-01	4.5781E-01	8.7925E-01	8.7962E-01	9.717E-01
AC-228		4.4429E-01	4.4429E-01	1.9699E-01	1.9856E-01	
TH-227	#B	-7.4298E-02	-7.4298E-02	3.3120E-01	3.3122E-01	3.585E-01
PA-234	#B	3.9664E-03	3.9664E-03	1.7366E-01	1.7366E-01	1.960E-01
TH-234	#B	1.0774E+00	1.0774E+00	3.3348E+00	3.3353E+00	3.706E+00
AM-241	#A	-6.5660E-02	-6.5660E-02	5.1566E-01	5.1568E-01	5.784E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (50.2 to 1999.0 keV) 9.1132755E+00 pCi/gm
Total Decayed Activity (50.2 to 1999.0 keV) 9.1132755E+00 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JPK

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 102F_22AUG2006_1010.An1

Sample description
FSS-OOL-05-04-079-F

Spectrum Filename: C:\GammaVision\Spectra\102F_22AUG2006_1010.An1

Acquisition information
Start time: 22-Aug-2006 10:10:12
Live time: 2000
Real time: 2010
Dead time: 0.49 %
Detector ID: 3

Detector system
Det 102 - DSPP-468

Calibration
Filename: D2_1LSa.Clb
DET 102 1 Liter Sand Geometry

Energy Calibration
Created: 15-Jan-2005 03:09:29
Zero offset: 0.220 keV
Gain: 0.500 keV/channel
Quadratic: -6.435E-08 keV/channel^2

Efficiency Calibration
Created: 15-Jan-2005 06:48:10
Type: Polynomial
Uncertainty: 0.497 %
Coefficients: -0.294180 -5.980622 0.744607
-0.096737 0.005214 -0.000120

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.22keV)
Stop channel: 4000 (1999.02keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 7.4600E+02
Activity scaling factor: 1.0000E+06/(1.0000E+00* 7.4600E+02) =
1.3405E+03
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit:	12.000
Activity range factor:	2.000
Min. step backg. energy	0.000
Multiplet shift channel	2.000

Corrections	Status	Comments
Decay correct to date:	YES	19-Aug-2006 08:40:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	102_150K_28APR05.Pbc 01-May-2005 05:27:47
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 8 cutoff 20.00000 %

Energy Calibration

Normalized diff: 0.7646

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
76.83	94.	33.15	0.75	9.459E-03				
76.83	94.	33.15	0.75	9.459E-03	77.11	10.700	1.661E+00	PB214
					77.11	17.500	1.015E+00	PB212
186.26	38.	37.14	1.50	1.627E-02	185.99	3.280	PBC<MDA	RA226
239.52	271.	8.23	1.15	1.376E-02	238.63	43.100	8.251E-01	PB212
241.60	40.	40.78	1.50	1.370E-02	241.00	3.900	PBC<MDA	RA224
					241.92	7.470	PBC<MDA	PB214
295.64	48.	28.58	0.77	1.145E-02	295.22	19.200	3.975E-01	PB214
339.17	40.	28.38	1.24	1.004E-02	338.40	12.010	5.952E-01	AC228
352.63	90.	13.59	1.11	9.661E-03	351.99	37.100	4.541E-01	PB214
463.99	24.	31.33	0.96	7.357E-03	463.51	10.000	5.584E-01	SB125
511.80	29.	32.45	1.50	6.695E-03	510.72	22.500	3.444E-01	TL208
583.91	59.	19.69	1.18	5.883E-03	583.14	86.000	2.095E-01	TL208
610.45	62.	15.24	1.24	5.639E-03	609.32	46.090	4.299E-01	BI214
1463.22	120.	9.13	1.90	2.617E-03				

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
153.24	76.83	334.	94.	0.047	99.46	0.746	PB-214	l
2927.34	1463.22	-1.	121.	0.061	26.92	1.898	K-40	M

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.

C - Area < Critical level.
M - Peak is close to a library peak.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
RA-226	372.14	186.26	105.	38.	0.019	111.42	1.500s
PB-212	477.69	239.03	128.	186.	0.093	33.87	1.500s
PB-214	591.25	295.80	42.	41.	0.020	82.04	1.500s
AC-228	677.40	338.86	31.	35.	0.018	84.08	1.500s
PB-214	704.58	352.45	22.	74.	0.037	43.94	1.500
TL-208	1023.38	511.80	29.	29.	0.014	97.34	1.500s
TL-208	1168.13	584.15	18.	48.	0.024	57.10	1.499s
BI-214	1220.75	610.45	11.	62.	0.031	45.71	1.242

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

Nuclide Name	Nuclide Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	MDA Value pCi/gm	COMMENTS
BE-7		8.4373E-03					
			477.56	8.437E-03	&(	4.780E-01 1.25E-01	G
K-40		-1.0345E-01					
			1460.75	-1.035E-01	%(P	1.034E+00 2.70E-01	G
MN-54		-1.3453E-03					
			834.81	-1.345E-03	%(P	9.867E-02 2.63E-02	G
CO-57		1.5498E-02					
			122.07	1.550E-02	&(	6.621E-02 1.96E-02	G K
			136.43	-7.886E-02	&	6.061E-01 1.78E-01	G
CO-60		-8.7887E-03					
			1332.51	-8.789E-03	%(P	1.179E-01 3.13E-02	G K
			1173.23	3.967E-03	%	9.604E-02 2.49E-02	G K
Sr-85		-4.0443E-04					
			514.00	-4.044E-04	%(	8.716E-02 2.41E-02	G
Kr-85		-1.0329E+01					
			513.99	-1.033E+01	%(	1.948E+03 5.40E+02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
Y-88	-5.6815E-05						
		1836.01	-5.682E-05	%(P	1.457E-01	3.71E-02	G K
		898.02	8.739E-03	% P	7.976E-02	2.08E-02	G
NB-94	-1.6075E-03						
		871.10	-1.608E-03	%(	7.210E-02	1.84E-02	G K
		702.50	0.000E+00	%	9.246E-02	2.50E-02	G K
Ag-108M	1.6856E-02						
		722.95	1.686E-02	&(	6.808E-02	1.92E-02	G K
		614.37	-2.869E-02	& P	1.071E-01	3.11E-02	G
		433.93	7.073E-03	%	5.419E-02	1.50E-02	G
CD-109	-3.8032E-02						
		88.04	-3.803E-02	&(P	3.488E+00	1.02E+00	G
SN-113	6.2565E-03						
		391.71	6.257E-03	%(	7.353E-02	2.01E-02	G K
		255.04	1.385E-01	%	2.451E+00	6.95E-01	G
SB-125	1.2703E-02						
		427.95	1.270E-02	&(P	1.856E-01	5.04E-02	G K
		600.77	3.999E-02	% P	2.985E-01	8.05E-02	G
		636.15	-6.419E-02	% P	6.524E-01	1.78E-01	G
		463.51	3.554E-01	% P	5.158E-01	1.62E-01	G
		176.29	2.496E-01	% P	8.060E-01	2.38E-01	G
I-131	-1.2949E-02						
		364.48	-1.295E-02	&(	1.039E-01	2.97E-02	G K
		636.97	-1.450E-01	&	1.338E+00	3.69E-01	G
		284.29	-3.552E-03	%	1.096E+00	3.06E-01	G
CS-134	-9.0045E-03						
		604.66	-9.005E-03	%(	7.465E-02	2.07E-02	G K
		795.76	2.000E-02	%	7.862E-02	2.22E-02	G
		569.29	-5.365E-02	%	4.195E-01	1.16E-01	G
		801.84	-1.111E-01	% P	8.329E-01	2.25E-01	G
CS-137	7.1349E-02						
		661.62	7.135E-02	&(	9.336E-02	3.03E-02	G
CE-139	9.8418E-03						
		165.85	9.842E-03	&(P	6.380E-02	1.86E-02	G
EU-152	2.5710E-02						
		121.78	2.571E-02	&(P	1.928E-01	5.62E-02	G K
		344.30	-7.592E-03	&	2.001E-01	5.56E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
		1408.08	1.715E-02	%	4.496E-01	1.13E-01	G
		964.00	-7.657E-03	% P	4.554E-01	1.08E-01	G
		1112.07	-9.689E-02	&	8.762E-01	2.41E-01	G
		778.90	-9.016E-02	% P	6.262E-01	1.72E-01	G
EU-154	3.6186E-02						
		123.10	3.619E-02	&(P	1.448E-01	4.29E-02	G K
		1274.80	0.000E+00	%	3.397E-01	8.88E-02	G
		723.30	-6.455E-02	% P	4.386E-01	1.22E-01	G
		1004.80	-5.199E-03	%	5.145E-01	1.33E-01	G
EU-155	-1.7636E-02						
		86.45	-1.764E-02	%(P	4.335E-01	1.27E-01	G K
		105.31	6.106E-02	%	3.374E-01	9.96E-02	G
HG-203	1.5013E-03						
		279.17	1.501E-03	%(P	6.832E-02	1.92E-02	G K
		72.87	-4.479E-02	&	3.168E+00	9.33E-01	G
		70.83	2.808E+00	%	4.459E+00	1.37E+00	G
		82.50	-1.348E+00	%	7.237E+00	2.16E+00	G
TL-208	1.7051E-01						
		583.14	1.705E-01	@(P	8.087E-02	3.27E-02	G
		510.72	3.444E-01	+	3.336E-01	1.12E-01	G
PB-212	5.6720E-01						
		238.63	5.672E-01	@(	1.688E-01	6.40E-02	G K
							Energy duplication
		77.11	6.426E-01	%	1.014E+00	3.10E-01	G
		74.81	5.815E-01	& P	2.060E+00	6.17E-01	G
PB-214	3.5956E-01						
		351.99	3.721E-01	(P	1.246E-01	5.48E-02	G K
		295.22	3.353E-01	(	2.700E-01	9.17E-02	G
							Energy duplication
		77.11	1.051E+00	%	1.659E+00	5.08E-01	G
		241.92	6.079E-01	%	1.004E+00	3.08E-01	G
BI-212	1.2085E-01						
		727.17	1.209E-01	%(	5.677E-01	1.59E-01	G K
		1620.56	2.800E-01	% P	2.087E+00	4.67E-01	G
		785.42	-7.203E-03	& P	4.538E+00	1.21E+00	G
BI-214	4.2995E-01						
		609.32	4.299E-01	(	1.274E-01	6.56E-02	G K
		1764.51	-1.248E-02	% P	7.981E-01	2.00E-01	G
		1120.28	-1.541E-01	&	8.384E-01	2.37E-01	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments

RA-224       1.3532E+00
                          241.00 1.353E+00 %(P 1.829E+00 5.68E-01 G

RA-226       1.2757E+00
                          185.99 1.276E+00 *(P 1.716E+00 5.30E-01 G

AC-228       1.3931E-01
                          911.07-2.263E-02 %(P 3.437E-01 9.22E-02 G K
                          968.90-9.479E-02 % P 5.805E-01 1.61E-01 G
                          338.40 5.303E-01 *(  4.325E-01 1.49E-01 G

TH-227       4.5016E-03
                          236.00 4.502E-03 &(P 6.291E-01 1.81E-01 G K
                          256.25 5.760E-02 &   6.641E-01 1.88E-01 G

PA-234      -1.1012E-02
                           98.44-1.101E-02 %(  3.375E-01 9.86E-02 G K
                          946.00-2.981E-03 %   3.342E-01 8.22E-02 G
                          131.28-4.744E-02 &   3.259E-01 9.59E-02 G
                           94.67-1.705E-02 %   6.688E-01 1.96E-01 G
                          883.24 6.041E-02 &   6.789E-01 1.82E-01 G
                          926.70-1.128E-01 %   8.774E-01 2.41E-01 G
                          569.26-3.571E-02 %   5.520E-01 1.47E-01 G

TH-234       3.0027E+00
                           63.29 3.003E+00 %(P 7.502E+00 2.26E+00 G K
                           92.80 1.662E+00 &   3.853E+00 1.16E+00 G
                           92.38 1.759E+00 & P 4.629E+00 1.39E+00 G

AM-241      -4.4096E-02
                           59.54-4.410E-02 &(  1.211E+00 3.57E-01 G
   ( - This peak used in the nuclide activity average.

   * - Peak is too wide, but only one peak in library.
   ! - Peak is part of a multiplet and this area went
       negative during deconvolution.
   ? - Peak is too narrow.
   @ - Peak is too wide at FW25M, but ok at FWHM.
   % - Peak fails sensitivity test.
   $ - Peak identified, but first peak of this nuclide
       failed one or more qualification tests.
   + - Peak activity higher than counting uncertainty range.
   - - Peak activity lower than counting uncertainty range.
   = - Peak outside analysis energy range.
   & - Calculated peak centroid is not close enough to the
       library energy centroid for positive identification.
```

P - Peakbackground subtraction
} - Peak is too close to another for the activity
to be found directly.

Nuclide Codes:
T - Thermal Neutron Activation
F - Fast Neutron Activation
I - Fission Product
N - Naturally Occurring Isotope
P - Photon Reaction
C - Charged Particle Reaction
M - No MDA Calculation
R - Coincidence Corrected
H - Halflife limit exceeded

Peak Codes:
G - Gamma Ray
X - X-Ray
P - Positron Decay
S - Single-Escape
D - Double-Escape
K - Key Line
A - Not in Average
C - Coincidence Peak

- -

***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	8.1084E-03	8.4373E-03	3.7469E-01	3.7469E-01	4.594E-01
K-40	#A	-1.0345E-01	-1.0345E-01	9.7824E-01	9.7826E-01	1.034E+00
MN-54	#A	-1.3362E-03	-1.3453E-03	4.1878E-01	4.1878E-01	9.800E-02
CO-57	#B	1.5376E-02	1.5498E-02	5.8678E-02	5.8685E-02	6.569E-02
CO-60	#B	-8.7790E-03	-8.7887E-03	1.0513E-01	1.0513E-01	1.178E-01
Sr-85	#A	-3.9140E-04	-4.0443E-04	7.2436E-02	7.2436E-02	8.436E-02
Kr-85	#A	-1.0329E+01	-1.0329E+01	1.6192E+03	1.6192E+03	1.948E+03
Y-88	#B	-5.5695E-05	-5.6815E-05	1.4601E-03	1.4601E-03	1.428E-01
NB-94	#B	-1.6075E-03	-1.6075E-03	5.5270E-02	5.5270E-02	7.210E-02
Ag-108M	#B	1.6855E-02	1.6856E-02	5.7503E-02	5.7510E-02	6.808E-02
CD-109	#A	-3.7854E-02	-3.8032E-02	1.4934E+01	1.4934E+01	3.472E+00
SN-113	#B	6.1422E-03	6.2565E-03	6.0355E-02	6.0356E-02	7.219E-02
SB-125	#B	1.2676E-02	1.2703E-02	1.5112E-01	1.5112E-01	1.852E-01
I-131	#B	-9.9444E-03	-1.2949E-02	8.8982E-02	8.8984E-02	7.978E-02
CS-134	#B	-8.9792E-03	-9.0045E-03	6.2065E-02	6.2067E-02	7.444E-02
CS-137	#A	7.1335E-02	7.1349E-02	9.0770E-02	9.0859E-02	9.335E-02
CE-139	#A	9.6910E-03	9.8418E-03	5.5774E-02	5.5777E-02	6.283E-02
EU-152	#B	2.5698E-02	2.5710E-02	1.6866E-01	1.6867E-01	1.927E-01
EU-154	#B	3.6162E-02	3.6186E-02	1.2861E-01	1.2863E-01	1.447E-01
EU-155	#B	-1.7615E-02	-1.7636E-02	2.9108E+00	2.9108E+00	4.330E-01
HG-203	#B	1.4345E-03	1.5013E-03	5.7647E-02	5.7647E-02	6.528E-02
TL-208	#	1.7051E-01	1.7051E-01	9.8186E-02	9.8651E-02	8.087E-02
PB-212	#	5.6720E-01	5.6720E-01	1.9212E-01	1.9474E-01	1.688E-01
PB-214	#	3.5956E-01	3.5956E-01	1.5882E-01	1.6010E-01	1.246E-01
BI-212	#B	1.2085E-01	1.2085E-01	4.7597E-01	4.7602E-01	5.677E-01
BI-214		4.2995E-01	4.2995E-01	1.9655E-01	1.9802E-01	
RA-224	#A	1.3532E+00	1.3532E+00	1.7034E+00	1.7051E+00	1.829E+00
RA-226	#A	1.2757E+00	1.2757E+00	1.5901E+00	1.5917E+00	1.716E+00
AC-228	#B	1.3931E-01	1.3931E-01	1.1713E-01	1.1739E-01	3.437E-01
TH-227	#B	4.5016E-03	4.5016E-03	5.4423E-01	5.4423E-01	6.291E-01

PA-234 #B	-1.1012E-02	-1.1012E-02	2.9570E-01	2.9570E-01	3.375E-01

TH-234 #B	3.0027E+00	3.0027E+00	6.7852E+00	6.7872E+00	7.502E+00
AM-241 #A	-4.4096E-02	-4.4096E-02	1.0696E+00	1.0696E+00	1.211E+00

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (50.2 to 1999.0 keV) 4.2994952E-01 pCi/gm
Total Decayed Activity (50.2 to 1999.0 keV) 4.2994952E-01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JPK

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 102F_22AUG2006_1054.An1

Sample description
FSS-OOL-05-04-080-F

Spectrum Filename: C:\GammaVision\Spectra\102F_22AUG2006_1054.An1

Acquisition information
Start time: 22-Aug-2006 10:54:28
Live time: 2000
Real time: 2014
Dead time: 0.72 %
Detector ID: 3

Detector system
Det 102 - DSPP-468

Calibration
Filename: D2_1LSa.Clb
DET 102 1 Liter Sand Geometry

Energy Calibration
Created: 15-Jan-2005 03:09:29
Zero offset: 0.220 keV
Gain: 0.500 keV/channel
Quadratic: -6.435E-08 keV/channel^2

Efficiency Calibration
Created: 15-Jan-2005 06:48:10
Type: Polynomial
Uncertainty: 0.497 %
Coefficients: -0.294180 -5.980622 0.744607
-0.096737 0.005214 -0.000120

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.22keV)
Stop channel: 4000 (1999.02keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 1.4910E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.4910E+03) =
6.7069E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	19-Aug-2006 08:10:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	102_150K_28APR05.Pbc 01-May-2005 05:27:47
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 10 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.8168

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
77.25	83.	40.03	1.50	9.541E-03	77.11	10.700	PBC<MDA	PB214
					77.11	17.500	4.518E-01	PB212
77.25	83.	40.03	1.50	9.541E-03	77.11	10.700	7.389E-01	PB214
					77.11	17.500	4.518E-01	PB212
93.22	84.	37.95	1.50	1.333E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	1.898E+00	TH234
93.22	75.	41.08	1.50	1.325E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
186.36	64.	28.10	1.80	1.625E-02	185.99	3.280	PBC<MDA	RA226
209.25	51.	38.89	0.99	1.519E-02				
239.29	357.	8.36	1.19	1.377E-02	238.63	43.100	5.435E-01	PB212
271.20	45.	35.91	0.92	1.239E-02				
295.65	88.	18.29	1.47	1.145E-02	295.22	19.200	3.603E-01	PB214
338.77	58.	25.34	1.87	1.005E-02	338.40	12.010	4.388E-01	AC228
352.55	126.	12.50	1.13	9.663E-03	351.99	37.100	3.166E-01	PB214
511.92	60.	23.13	1.74	6.680E-03	510.72	22.500	3.622E-01	TL208
					513.99	0.004	1.907E+03	Kr85
					514.00	99.270	8.541E-02	Sr85
584.47	106.	12.79	1.45	5.877E-03	583.14	86.000	1.891E-01	TL208
610.38	84.	14.02	1.09	5.640E-03	609.32	46.090	2.910E-01	BI214
912.66	88.	13.84	1.86	3.916E-03				
970.63	31.	30.53	1.23	3.712E-03				
1463.08	337.	5.45	2.19	2.617E-03	1460.75	10.700	1.089E+01	K40

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

Peak Centroid	Background	Net Area	Intensity	Uncert	FWHM	Suspected

Channel	Energy	Counts	Counts	Cts/Sec	3 Sigma %	keV	Nuclide	
418.12	209.25	133.	51.	0.026	116.67	0.995	AC-228	sM

Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM	Suspected	
542.05	271.20	82.	45.	0.023	107.72	0.917	PA-234	M
1825.45	912.66	16.	88.	0.044	37.56	1.863	AC-228	sM
1941.47	970.63	22.	31.	0.016	82.61	1.235	AC-228	M

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.
M - Peak is close to a library peak.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-214	153.80	77.11	513.	83.	0.042	120.10	1.500D
PB-212	153.80	77.11	513.	83.	0.042	120.10	1.500D
TH-234	186.01	93.22	463.	84.	0.042	113.84	1.500s
RA-226	372.11	186.25	193.	54.	0.027	106.72	1.500s
PB-212	477.67	239.02	185.	266.	0.133	28.42	1.500
PB-214	591.04	295.69	53.	85.	0.043	48.65	1.500s
AC-228	677.05	338.69	82.	53.	0.027	82.76	1.500
PB-214	704.70	352.51	76.	127.	0.064	39.25	1.500
TL-208	1023.62	511.92	42.	60.	0.030	69.40	1.737s
Kr-85	1022.44	511.33	22.	43.	0.022	64.58	1.499s
Sr-85	1022.44	511.33	22.	43.	0.022	64.58	1.499s
TL-208	1168.78	584.47	29.	106.	0.053	38.37	1.447
BI-214	1220.61	610.38	23.	84.	0.042	42.07	1.091
K-40	2927.09	1463.09	12.	317.	0.159	17.47	2.042

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Code	MDA Value pCi/gm	COMMENTS
BE-7		1.9516E-01					
			477.56	1.952E-01	%(	4.314E-01	1.30E-01 G
K-40		1.0259E+01					
			1460.75	1.026E+01	(P	6.181E-01	5.98E-01 G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
MN-54	-8.5170E-03						
		834.81	-8.517E-03	%(P	5.731E-02	1.61E-02	G
CO-57	-1.5205E-03						
		122.07	-1.521E-03	&(	4.998E-02	1.47E-02	G K
		136.43	-3.026E-02	&	4.084E-01	1.20E-01	G
CO-60	-2.4909E-04						
		1332.51	-2.491E-04	%(P	1.006E-01	2.79E-02	G K
		1173.23	2.723E-02	%	6.148E-02	1.85E-02	G K
Sr-85	6.1465E-02						
		514.00	6.147E-02	&(	3.473E-02	1.32E-02	G
Kr-85	1.3725E+03						
		513.99	1.373E+03	&(	7.755E+02	2.95E+02	G
Y-88	-4.0672E-03						
		1836.01	-4.067E-03	%(P	4.831E-02	1.18E-02	G K
		898.02	-7.599E-03	% P	6.313E-02	1.73E-02	G
NB-94	6.9944E-03						
		871.10	6.994E-03	%(	4.653E-02	1.29E-02	G K
		702.50	9.584E-03	&	3.845E-02	1.10E-02	G K
Ag-108M	-5.8169E-03						
		722.95	-5.817E-03	%(	5.115E-02	1.42E-02	G K
		614.37	-3.324E-02	& P	7.262E-02	2.19E-02	G
		433.93	-3.708E-05	%	4.024E-02	1.12E-02	G
CD-109	7.4035E-01						
		88.04	7.403E-01	&(P	1.977E+00	5.96E-01	G
SN-113	-9.9218E-03						
		391.71	-9.922E-03	%(	5.772E-02	1.67E-02	G K
		255.04	-3.548E-01	%	1.893E+00	5.57E-01	G
SB-125	-2.0060E-02						
		427.95	-2.006E-02	%(P	1.322E-01	3.74E-02	G K
		600.77	-2.923E-02	% P	2.519E-01	7.09E-02	G
		636.15	-1.357E-03	& P	3.626E-01	9.76E-02	G
		463.51	2.263E-01	% P	3.801E-01	1.17E-01	G
		176.29	-2.356E-02	& P	5.800E-01	1.68E-01	G
I-131	-4.9283E-04						
		364.48	-4.928E-04	%(	5.111E-02	1.43E-02	G K
		636.97	-1.432E-01	%	8.336E-01	2.37E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
		284.29	0.000E+00	%	1.008E+00	2.92E-01	G
CS-134	1.1266E-02						
		604.66	1.127E-02	%(	4.205E-02	1.22E-02	G K
		795.76	1.543E-02	&	5.930E-02	1.71E-02	G
		569.29	7.682E-02	&	2.580E-01	7.54E-02	G
		801.84	7.713E-03	% P	5.525E-01	1.49E-01	G
CS-137	3.5875E-03						
		661.62	3.588E-03	%(	5.222E-02	1.44E-02	G
CE-139	-4.4860E-03						
		165.85	-4.486E-03	&(P	3.958E-02	1.16E-02	G
EU-152	-4.9954E-03						
		121.78	-4.995E-03	&(P	1.482E-01	4.34E-02	G K
		344.30	-4.494E-02	%	1.587E-01	4.70E-02	G
		1408.08	5.906E-02	%	2.207E-01	6.20E-02	G
		964.00	1.704E-02	% P	4.164E-01	1.14E-01	G
		1112.07	1.150E-01	%	5.155E-01	1.48E-01	G
		778.90	-2.553E-02	% P	3.993E-01	1.10E-01	G
EU-154	5.2278E-04						
		123.10	5.228E-04	%(P	1.070E-01	3.14E-02	G K
		1274.80	-1.333E-03	%	1.440E-01	3.67E-02	G
		723.30	-4.492E-02	% P	2.856E-01	8.11E-02	G
		1004.80	-3.003E-02	%	3.414E-01	9.42E-02	G
EU-155	7.5956E-02						
		86.45	7.596E-02	%(P	2.559E-01	7.68E-02	G K
		105.31	4.540E-02	%	2.286E-01	6.81E-02	G
HG-203	1.2431E-02						
		279.17	1.243E-02	%(P	4.909E-02	1.45E-02	G K
		72.87	-5.480E-01	%	2.051E+00	6.16E-01	G
		70.83	-6.283E-04	%	3.759E+00	1.11E+00	G
		82.50	-1.086E+00	%	4.379E+00	1.31E+00	G
TL-208	1.8912E-01						
		583.14	1.891E-01	(P	4.999E-02	2.43E-02	G
		510.72	3.622E-01	+	1.976E-01	8.40E-02	G
PB-212	4.1885E-01						
		238.63	4.055E-01	(	1.006E-01	3.84E-02	G K
							Energy duplication
		77.11	4.518E-01	(	5.879E-01	1.81E-01	G
		74.81	5.436E-01	& P	1.201E+00	3.63E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
PB-214	3.3149E-01						
		351.99	3.211E-01	(P	1.093E-01	4.21E-02	G K
		295.22	3.516E-01	(	1.511E-01	5.70E-02	G
							Energy duplication
		77.11	7.389E-01	+	9.615E-01	2.96E-01	G
		241.92	1.896E-01	%	6.928E-01	2.07E-01	G
BI-212	2.2805E-01						
		727.17	2.281E-01	%(	3.893E-01	1.21E-01	G K
		1620.56	-4.614E-02	% P	1.013E+00	1.37E-01	G
		785.42	-2.329E-01	& P	2.117E+00	5.79E-01	G
BI-214	2.9100E-01						
		609.32	2.910E-01	(	8.790E-02	4.09E-02	G K
		1764.51	-6.276E-03	% P	4.007E-01	1.01E-01	G
		1120.28	0.000E+00	&	5.297E-01	1.46E-01	G
RA-224	5.0098E-01						
		241.00	5.010E-01	&(P	1.263E+00	3.80E-01	G
RA-226	9.2067E-01						
		185.99	9.207E-01	*(P	1.145E+00	3.54E-01	G
AC-228	1.1703E-01						
		911.07	-4.416E-04	%(P	2.280E-01	6.25E-02	G K
		968.90	8.665E-04	% P	4.101E-01	1.13E-01	G
		338.40	4.007E-01	(	3.366E-01	1.11E-01	G
TH-227	-1.2924E-01						
		236.00	-1.292E-01	%(P	4.346E-01	1.30E-01	G K
		256.25	-6.889E-02	%	5.204E-01	1.52E-01	G
PA-234	1.4409E-03						
		98.44	1.441E-03	&(	2.432E-01	7.18E-02	G K
		946.00	1.135E-01	%	2.097E-01	6.52E-02	G
		131.28	-1.916E-02	&	2.232E-01	6.60E-02	G
		94.67	-5.456E-02	%	4.282E-01	1.27E-01	G
		883.24	0.000E+00	%	3.861E-01	1.02E-01	G
		926.70	1.646E-04	%	4.176E-01	1.09E-01	G
		569.26	1.136E-01	&	3.817E-01	1.12E-01	G
TH-234	7.4102E-01						
		63.29	-1.489E-01	%(P	4.317E+00	1.27E+00	G K
		92.80	1.898E+00	(	2.334E+00	7.20E-01	G
		92.38	1.992E+00	% P	2.705E+00	8.31E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
AM-241	1.2902E-01						
		59.54	1.290E-01	%(	6.862E-01	2.05E-01	G

(- This peak used in the nuclide activity average.

* - Peak is too wide, but only one peak in library.
! - Peak is part of a multiplet and this area went negative during deconvolution.
? - Peak is too narrow.
@ - Peak is too wide at FW25M, but ok at FWHM.
% - Peak fails sensitivity test.
$ - Peak identified, but first peak of this nuclide failed one or more qualification tests.
+ - Peak activity higher than counting uncertainty range.
- - Peak activity lower than counting uncertainty range.
= - Peak outside analysis energy range.
& - Calculated peak centroid is not close enough to the library energy centroid for positive identification.
P - Peakbackground subtraction
} - Peak is too close to another for the activity to be found directly.

Nuclide Codes:
T - Thermal Neutron Activation
F - Fast Neutron Activation
I - Fission Product
N - Naturally Occurring Isotope
P - Photon Reaction
C - Charged Particle Reaction
M - No MDA Calculation
R - Coincidence Corrected
H - Halflife limit exceeded

Peak Codes:
G - Gamma Ray
X - X-Ray
P - Positron Decay
S - Single-Escape
D - Double-Escape
K - Key Line
A - Not in Average
C - Coincidence Peak

- -

***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	1.8742E-01	1.9516E-01	3.9110E-01	3.9125E-01	4.143E-01
K-40		1.0259E+01	1.0259E+01	1.7933E+00	1.8835E+00	6.181E-01
MN-54	#A	-8.4583E-03	-8.5170E-03	5.3824E-02	5.3826E-02	5.691E-02
CO-57	#B	-1.5084E-03	-1.5205E-03	4.4034E-02	4.4034E-02	4.958E-02
CO-60	#B	-2.4881E-04	-2.4909E-04	1.3005E-02	1.3005E-02	1.005E-01
Sr-85	#	5.9453E-02	6.1465E-02	3.9692E-02	3.9842E-02	3.359E-02
Kr-85	#	1.3725E+03	1.3725E+03	8.8634E+02	8.8968E+02	7.755E+02
Y-88	#B	-3.9857E-03	-4.0672E-03	3.6048E-02	3.6048E-02	4.734E-02
NB-94	#B	6.9944E-03	6.9944E-03	3.8732E-02	3.8734E-02	4.653E-02
Ag-108M	#B	-5.8167E-03	-5.8169E-03	4.2736E-02	4.2737E-02	5.115E-02
CD-109	#A	7.3683E-01	7.4035E-01	1.7868E+00	1.7873E+00	1.967E+00

SN-113	#B	-9.7374E-03	-9.9218E-03	4.9967E-02	4.9970E-02	5.664E-02
SB-125	#B	-2.0017E-02	-2.0060E-02	1.6541E-01	1.6542E-01	1.319E-01
I-131	#B	-3.7679E-04	-4.9283E-04	4.2761E-02	4.2761E-02	3.907E-02
CS-134	#B	1.1234E-02	1.1266E-02	3.6586E-02	3.6591E-02	4.193E-02
CS-137	#A	3.5868E-03	3.5875E-03	4.3263E-02	4.3263E-02	5.221E-02
CE-139	#A	-4.4162E-03	-4.4860E-03	3.9579E-02	3.9580E-02	3.896E-02
EU-152	#B	-4.9931E-03	-4.9954E-03	2.5522E-01	2.5522E-01	1.481E-01
EU-154	#B	5.2241E-04	5.2278E-04	9.4124E-02	9.4124E-02	1.069E-01
EU-155	#B	7.5865E-02	7.5956E-02	2.3036E-01	2.3040E-01	2.556E-01
HG-203	#B	1.1868E-02	1.2431E-02	4.3559E-02	4.3565E-02	4.687E-02
TL-208		1.8912E-01	1.8912E-01	7.2839E-02	7.3608E-02	
PB-212	#	4.1885E-01	4.1885E-01	1.1904E-01	1.2134E-01	1.006E-01
PB-214	#	3.3149E-01	3.3149E-01	1.0372E-01	1.0538E-01	1.093E-01
BI-212	#B	2.2805E-01	2.2805E-01	3.6337E-01	3.6360E-01	3.893E-01
BI-214		2.9100E-01	2.9100E-01	1.2242E-01	1.2350E-01	
RA-224	#A	5.0098E-01	5.0098E-01	1.1405E+00	1.1408E+00	1.263E+00
RA-226	#A	9.2066E-01	9.2067E-01	1.0634E+00	1.0647E+00	1.145E+00
AC-228	B	1.1703E-01	1.1703E-01	9.6849E-02	9.7071E-02	2.280E-01
TH-227	#B	-1.2924E-01	-1.2924E-01	3.9988E-01	3.9995E-01	4.346E-01
PA-234	#B	1.4409E-03	1.4409E-03	2.1532E-01	2.1532E-01	2.432E-01
TH-234	#B	7.4102E-01	7.4102E-01	8.4361E-01	8.4461E-01	4.317E+00
AM-241	#A	1.2902E-01	1.2902E-01	6.1381E-01	6.1385E-01	6.862E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (50.2 to 1999.0 keV) 1.0855941E+01 pCi/gm
Total Decayed Activity (50.2 to 1999.0 keV) 1.0855941E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JPK

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 102F_22AUG2006_1152.An1

Sample description
FSS-OOL-05-04-073-F

Spectrum Filename: C:\GammaVision\Spectra\102F_22AUG2006_1152.An1

Acquisition information
Start time: 22-Aug-2006 11:51:41
Live time: 2000
Real time: 2018
Dead time: 0.88 %
Detector ID: 3

Detector system
Det 102 - DSPP-468

Calibration
Filename: D2_1LSa.Clb
DET 102 1 Liter Sand Geometry

Energy Calibration
Created: 15-Jan-2005 03:09:29
Zero offset: 0.220 keV
Gain: 0.500 keV/channel
Quadratic: -6.435E-08 keV/channel^2

Efficiency Calibration
Created: 15-Jan-2005 06:48:10
Type: Polynomial
Uncertainty: 0.497 %
Coefficients: -0.294180 -5.980622 0.744607
-0.096737 0.005214 -0.000120

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.22keV)
Stop channel: 4000 (1999.02keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 1.3780E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.3780E+03) =
7.2569E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	19-Aug-2006 08:30:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	102_150K_28APR05.Pbc 01-May-2005 05:27:47
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 10 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.7012

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
74.48	103.	35.59	1.50	8.847E-03				
74.48	103.	35.59	1.50	8.847E-03	74.81	9.600	PBC<MDA	PB212
77.13	143.	27.08	1.50	9.541E-03	77.11	10.700	1.377E+00	PB214
					77.11	17.500	8.417E-01	PB212
77.13	143.	27.08	1.50	9.541E-03	77.11	10.700	1.377E+00	PB214
					77.11	17.500	8.417E-01	PB212
92.58	133.	30.68	1.87	1.329E-02	92.38	2.570	3.791E+00	TH234
					92.80	3.000	3.256E+00	TH234
					94.67	15.500	6.141E-01	PA234
186.17	110.	30.18	1.03	1.626E-02	185.99	3.280	1.940E+00	RA226
209.30	71.	34.75	1.03	1.519E-02				
239.09	497.	5.27	1.22	1.378E-02	238.63	43.100	8.189E-01	PB212
241.73	85.	27.09	1.22	1.366E-02	241.00	3.900	1.540E+00	RA224
					241.92	7.470	8.179E-01	PB214
295.80	112.	14.33	1.26	1.145E-02	295.22	19.200	5.010E-01	PB214
300.30	38.	32.76	1.26	1.129E-02				
339.66	109.	18.92	0.94	1.002E-02	338.40	12.010	8.823E-01	AC228
352.49	231.	10.89	1.63	9.665E-03	351.99	37.100	6.301E-01	PB214
463.96	34.	38.24	1.21	7.358E-03	463.51	10.000	PBC<MDA	SB125
511.35	72.	20.75	1.29	6.687E-03	510.72	22.500	4.687E-01	TL208
584.11	155.	11.04	1.26	5.881E-03	583.14	86.000	2.993E-01	TL208
610.41	163.	11.03	1.52	5.640E-03	609.32	46.090	6.128E-01	BI214
663.50	80.	16.52	1.22	5.216E-03	661.62	84.620	1.767E-01	CS137
912.45	111.	13.04	1.47	3.917E-03	911.07	29.000	9.560E-01	AC228
969.56	85.	15.88	1.73	3.716E-03	968.90	17.460	1.287E+00	AC228
1120.98	32.	40.98	2.17	3.283E-03	1120.28	15.040	PBC<MDA	BI214
1463.16	425.	4.85	1.48	2.617E-03	1460.75	10.700	1.486E+01	K40

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
418.21	209.30	224.	71.	0.036	104.24	1.028	AC-228	
477.81	239.08	94.	497.	0.248	15.80	1.215	PB-212	D
483.09	241.73	223.	85.	0.043	81.26	1.217	PB-214	D
600.08	300.21	68.	34.	0.017	114.19	1.262	PB-212	

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-212	148.54	74.48	664.	103.	0.052	106.78	1.500s
PB-214	153.80	77.11	681.	143.	0.072	81.24	1.500D
PB-212	153.80	77.11	681.	143.	0.072	81.24	1.500D
TH-234	185.86	93.14	652.	90.	0.045	124.30	1.500s
RA-226	372.25	186.32	335.	65.	0.033	116.45	1.500s
PB-212	477.82	239.10	284.	431.	0.216	21.99	1.500
RA-224	483.64	242.00	289.	77.	0.039	97.97	1.500
PB-214	483.57	241.97	286.	76.	0.038	100.95	1.500
PB-214	591.15	295.75	146.	120.	0.060	50.76	1.500s
AC-228	677.75	339.04	120.	75.	0.038	70.73	1.500
PB-214	704.85	352.59	122.	188.	0.094	33.12	1.500s
SB-125	927.35	463.80	53.	35.	0.018	95.82	1.500
TL-208	1022.49	511.35	54.	72.	0.036	62.25	1.286s
TL-208	1168.05	584.11	46.	155.	0.077	33.13	1.263
BI-214	1220.66	610.41	48.	163.	0.081	33.09	1.517
CS-137	1325.46	662.78	42.	59.	0.029	61.06	1.509s
AC-228	1825.30	912.58	22.	97.	0.049	36.48	1.679s
AC-228	1941.09	970.44	32.	54.	0.027	60.79	1.718s
BI-214	2242.35	1120.98	40.	32.	0.016	122.95	2.174s
K-40	2927.28	1463.19	-1.	404.	0.202	14.90	2.042

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	Peak MDA Value pCi/gm	COMMENTS
BE-7		-1.3350E-01					
			477.56	-1.335E-01	&(	6.055E-01 1.78E-01	G
K-40		1.4122E+01					
			1460.75	1.412E+01	(P	2.577E-01 7.02E-01	G
MN-54		-7.8916E-03					
			834.81	-7.892E-03	&(P	7.587E-02 2.15E-02	G
CO-57		8.3615E-04					
			122.07	8.362E-04	%(	6.192E-02 1.82E-02	G K
			136.43	-1.436E-01	%	5.384E-01 1.61E-01	G
CO-60		-1.2366E-02					
			1332.51	-1.237E-02	%(P	8.028E-02 2.24E-02	G K
			1173.23	4.380E-04	%	8.021E-02 2.18E-02	G K
Sr-85		-1.5791E-02					
			514.00	-1.579E-02	%(	7.323E-02 2.15E-02	G
Kr-85		-3.5251E+02					
			513.99	-3.525E+02	%(	1.635E+03 4.81E+02	G
Y-88		-3.0773E-05					
			1836.01	-3.077E-05	%(P	3.456E-02 4.69E-03	G K
			898.02	-1.723E-02	& P	8.862E-02 2.54E-02	G
NB-94		-2.0426E-03					
			871.10	-2.043E-03	&(	6.353E-02 1.74E-02	G K
			702.50	-7.404E-05	%	4.052E-02 1.07E-02	G K
Ag-108M		6.0160E-03					
			722.95	6.016E-03	%(	6.902E-02 1.94E-02	G K
			614.37	-4.095E-02	% P	8.879E-02 2.68E-02	G
			433.93	-3.353E-03	%	5.419E-02 1.55E-02	G
CD-109		-6.7429E-01					
			88.04	-6.743E-01	&(P	2.941E+00 8.82E-01	G
SN-113		1.2539E-02					
			391.71	1.254E-02	%(	5.591E-02 1.62E-02	G K
			255.04	1.867E-01	%	2.153E+00 6.29E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	1.1451E-01						
		427.95	-6.303E-03	%(P	1.577E-01	4.42E-02	G K
		600.77	-1.565E-02	& P	2.760E-01	7.68E-02	G
		636.15	1.203E-01	% P	4.841E-01	1.41E-01	G
		463.51	4.721E-01	(P	4.873E-01	1.57E-01	G
		176.29	-2.452E-02	& P	7.180E-01	2.09E-01	G
I-131	1.2914E-02						
		364.48	1.291E-02	%(	7.201E-02	2.10E-02	G K
		636.97	1.128E-03	&	1.020E+00	2.83E-01	G
		284.29	-3.743E-01	%	1.151E+00	3.44E-01	G
CS-134	-8.1135E-03						
		604.66	-8.114E-03	%(	5.698E-02	1.63E-02	G K
		795.76	2.547E-02	&	7.242E-02	2.14E-02	G
		569.29	-1.036E-01	%	3.708E-01	1.09E-01	G
		801.84	-9.381E-02	% P	8.198E-01	2.33E-01	G
CS-137	1.3008E-01						
		661.62	1.301E-01	&(	7.295E-02	2.65E-02	G
CE-139	-3.4400E-03						
		165.85	-3.440E-03	&(P	6.713E-02	1.98E-02	G
EU-152	2.1480E-02						
		121.78	2.148E-02	%(P	2.028E-01	6.02E-02	G K
		344.30	9.249E-03	%	1.783E-01	5.14E-02	G
		1408.08	0.000E+00	%	2.511E-01	6.21E-02	G
		964.00	-1.116E-01	% P	5.486E-01	1.57E-01	G
		1112.07	5.989E-02	%	6.104E-01	1.71E-01	G
		778.90	-3.303E-02	& P	5.352E-01	1.50E-01	G
EU-154	-2.6869E-02						
		123.10	-2.687E-02	%(P	1.467E-01	4.38E-02	G K
		1274.80	0.000E+00	&	1.700E-01	4.39E-02	G
		723.30	-1.371E-02	% P	4.268E-01	1.21E-01	G
		1004.80	0.000E+00	%	4.902E-01	1.36E-01	G
EU-155	8.0401E-02						
		86.45	8.040E-02	%(P	3.270E-01	9.81E-02	G K
		105.31	8.831E-02	%	3.015E-01	9.05E-02	G
HG-203	-1.2086E-03						
		279.17	-1.209E-03	%(P	6.778E-02	1.97E-02	G K
		72.87	-6.111E-01	%	2.389E+00	7.17E-01	G
		70.83	-4.491E-02	%	4.237E+00	1.25E+00	G
		82.50	-4.046E-02	&	3.790E+00	1.12E+00	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	2.9929E-01						
		583.14	2.993E-01	(P	6.671E-02	3.32E-02	G
		510.72	4.687E-01	+	2.406E-01	9.74E-02	G
PB-212	7.4864E-01						
		238.63	7.109E-01	(	1.339E-01	5.21E-02	G K
							Energy duplication
		77.11	8.417E-01	@(	7.304E-01	2.28E-01	G
		74.81	1.191E+00	& P	1.418E+00	4.36E-01	G
PB-214	5.1987E-01						
		351.99	5.122E-01	(P	1.477E-01	5.67E-02	G K
		295.22	5.348E-01	*(	2.631E-01	9.05E-02	G
							Energy duplication
		77.11	1.377E+00	+	1.195E+00	3.73E-01	G
		241.92	7.266E-01	+	7.832E-01	2.45E-01	G
BI-212	1.7529E-01						
		727.17	1.753E-01	&(	5.587E-01	1.65E-01	G K
		1620.56	-4.992E-02	% P	2.442E+00	6.07E-01	G
		785.42	4.186E-01	& P	2.626E+00	7.38E-01	G
BI-214	6.1838E-01						
		609.32	6.128E-01	(	1.322E-01	6.77E-02	G K
		1764.51	-2.399E-03	% P	7.469E-01	2.04E-01	G
		1120.28	6.355E-01	@(	6.392E-01	2.61E-01	G
RA-224	1.4157E+00						
		241.00	1.416E+00	(P	1.503E+00	4.69E-01	G
RA-226	1.1973E+00						
		185.99	1.197E+00	*(P	1.617E+00	4.97E-01	G
AC-228	8.2892E-01						
		911.07	8.399E-01	*(P	2.114E-01	1.02E-01	G K
		968.90	8.107E-01	@(P	4.416E-01	1.64E-01	G
		338.40	6.122E-01	-	4.371E-01	1.44E-01	G
TH-227	-1.2922E-01						
		236.00	-1.292E-01	%(P	5.283E-01	1.58E-01	G K
		256.25	1.179E-02	%	7.451E-01	2.17E-01	G
PA-234	1.3179E-01						
		98.44	1.318E-01	&(	2.871E-01	8.70E-02	G K
		946.00	6.626E-02	%	3.416E-01	9.75E-02	G
		131.28	-7.653E-03	&	2.750E-01	8.13E-02	G
		94.67	-2.136E-01	%	4.860E-01	1.47E-01	G
		883.24	6.090E-02	&	4.479E-01	1.24E-01	G
		926.70	2.143E-03	%	5.838E-01	1.58E-01	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26-7.350E-02 %   4.745E-01 1.35E-01 G

TH-234       1.8041E+00
                           63.29 1.492E+00 %(P 5.913E+00 1.77E+00 G K
                           92.80 2.209E+00 *(  2.984E+00 9.15E-01 G
                           92.38 2.567E+00 % P 3.555E+00 1.09E+00 G

AM-241       6.8811E-02
                           59.54 6.881E-02 &(  7.307E-01 2.17E-01 G
   ( - This peak used in the nuclide activity average.

   * - Peak is too wide, but only one peak in library.
   ! - Peak is part of a multiplet and this area went
       negative during deconvolution.
   ? - Peak is too narrow.
   @ - Peak is too wide at FW25M, but ok at FWHM.
   % - Peak fails sensitivity test.
   $ - Peak identified, but first peak of this nuclide
       failed one or more qualification tests.
   + - Peak activity higher than counting uncertainty range.
   - - Peak activity lower than counting uncertainty range.
   = - Peak outside analysis energy range.
   & - Calculated peak centroid is not close enough to the
       library energy centroid for positive identification.
   P - Peakbackground subtraction
   } - Peak is too close to another for the activity
       to be found directly.

   Nuclide Codes:                      Peak Codes:
   T - Thermal Neutron Activation      G - Gamma Ray
   F - Fast Neutron Activation         X - X-Ray
   I - Fission Product                 P - Positron Decay
   N - Naturally Occurring Isotope     S - Single-Escape
   P - Photon Reaction                 D - Double-Escape
   C - Charged Particle Reaction       K - Key Line
   M - No MDA Calculation              A - Not in Average
   R - Coincidence Corrected           C - Coincidence Peak
   H - Halflife limit exceeded

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
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***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	-1.2817E-01	-1.3350E-01	5.3295E-01	5.3301E-01	5.813E-01
K-40		1.4122E+01	1.4122E+01	2.1050E+00	2.2492E+00	2.577E-01
MN-54	#A	-7.8368E-03	-7.8916E-03	7.3038E-02	7.3040E-02	7.535E-02
CO-57	#B	8.2944E-04	8.3615E-04	5.4727E-02	5.4727E-02	6.142E-02
CO-60	#B	-1.2352E-02	-1.2366E-02	7.0276E-02	7.0279E-02	8.019E-02

Sr-85	#A	-1.5270E-02	-1.5791E-02	6.4595E-02	6.4601E-02	7.081E-02
Kr-85	#A	-3.5250E+02	-3.5251E+02	1.4420E+03	1.4422E+03	1.635E+03
Y-88	#B	-3.0151E-05	-3.0773E-05	1.8464E-04	1.8465E-04	3.386E-02
NB-94	#B	-2.0426E-03	-2.0426E-03	5.2337E-02	5.2337E-02	6.353E-02
Ag-108M	#B	6.0157E-03	6.0160E-03	5.8346E-02	5.8347E-02	6.902E-02
CD-109	#A	-6.7106E-01	-6.7429E-01	2.9035E+00	2.9038E+00	2.927E+00
SN-113	#B	1.2304E-02	1.2539E-02	4.8612E-02	4.8617E-02	5.486E-02
SB-125	#B	1.1426E-01	1.1451E-01	1.1452E-01	1.1470E-01	1.574E-01
I-131	#B	9.8512E-03	1.2914E-02	6.2964E-02	6.2968E-02	5.493E-02
CS-134	#B	-8.0901E-03	-8.1135E-03	4.8846E-02	4.8848E-02	5.681E-02
CS-137	#	1.3005E-01	1.3008E-01	7.9432E-02	7.9767E-02	7.294E-02
CE-139	#A	-3.3860E-03	-3.4400E-03	7.1636E-02	7.1636E-02	6.607E-02
EU-152	#B	2.1470E-02	2.1480E-02	1.8073E-01	1.8073E-01	2.027E-01
EU-154	#B	-2.6850E-02	-2.6869E-02	1.3424E-01	1.3424E-01	1.466E-01
EU-155	#B	8.0304E-02	8.0401E-02	2.9422E-01	2.9425E-01	3.266E-01
HG-203	#B	-1.1535E-03	-1.2086E-03	6.9510E-02	6.9510E-02	6.468E-02
TL-208		2.9929E-01	2.9929E-01	9.9417E-02	1.0083E-01	
PB-212	#	7.4864E-01	7.4864E-01	1.6463E-01	1.6990E-01	1.339E-01
PB-214	#	5.1987E-01	5.1987E-01	1.5764E-01	1.6031E-01	1.477E-01
BI-212	#B	1.7529E-01	1.7529E-01	4.9433E-01	4.9443E-01	5.587E-01
BI-214		6.1838E-01	6.1838E-01	2.0463E-01	2.0756E-01	
RA-224	#A	1.4157E+00	1.4157E+00	1.4078E+00	1.4101E+00	1.503E+00
RA-226	#A	1.1973E+00	1.1973E+00	1.4897E+00	1.4912E+00	1.617E+00
AC-228	#	8.2892E-01	8.2892E-01	2.9416E-01	2.9781E-01	2.114E-01
TH-227	#B	-1.2922E-01	-1.2922E-01	4.8629E-01	4.8635E-01	5.283E-01
PA-234	#B	1.3179E-01	1.3179E-01	2.6090E-01	2.6100E-01	2.871E-01
TH-234	#B	1.8041E+00	1.8041E+00	2.2425E+00	2.2447E+00	5.913E+00
AM-241	#A	6.8811E-02	6.8811E-02	6.4976E-01	6.4978E-01	7.307E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (295.7 to 1999.0 keV) 1.5170004E+01 pCi/gm
Total Decayed Activity (295.7 to 1999.0 keV) 1.5170029E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JJM

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 102F_24AUG2006_0852.An1

Sample description
FSS-OOL-05-04-088-F-I

Spectrum Filename: C:\GammaVision\Spectra\102F_24AUG2006_0852.An1

Acquisition information
Start time: 24-Aug-2006 08:52:26
Live time: 2000
Real time: 2014
Dead time: 0.68 %
Detector ID: 3

Detector system
Det 102 - DSPP-468

Calibration
Filename: D2_1LSa.Clb
DET 102 1 Liter Sand Geometry

Energy Calibration
Created: 15-Jan-2005 03:09:29
Zero offset: 0.220 keV
Gain: 0.500 keV/channel
Quadratic: -6.435E-08 keV/channel^2

Efficiency Calibration
Created: 15-Jan-2005 06:48:10
Type: Polynomial
Uncertainty: 0.497 %
Coefficients: -0.294180 -5.980622 0.744607
-0.096737 0.005214 -0.000120

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.22keV)
Stop channel: 4000 (1999.02keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 1.7590E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.7590E+03) =
5.6850E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	23-Aug-2006 16:10:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	102_150K_28APR05.Pbc 01-May-2005 05:27:47
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 9 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.7668

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
76.35	132.	22.10	1.12	9.315E-03	74.81	9.600	1.170E+00	PB212
					77.11	10.700	9.963E-01	PB214
					77.11	17.500	6.092E-01	PB212
186.37	66.	34.71	0.87	1.625E-02	185.99	3.280	PBC<MDA	RA226
238.96	211.	13.18	1.13	1.379E-02	238.63	43.100	2.722E-01	PB212
295.53	70.	23.38	1.03	1.145E-02	295.22	19.200	2.436E-01	PB214
338.62	40.	39.05	1.43	1.005E-02	338.40	12.010	2.543E-01	AC228
352.42	84.	15.52	1.06	9.667E-03	351.99	37.100	1.797E-01	PB214
511.59	52.	23.32	0.90	6.695E-03	510.72	22.500	2.637E-01	TL208
584.47	88.	15.83	1.46	5.877E-03	583.14	86.000	1.335E-01	TL208
610.15	90.	15.93	1.69	5.642E-03	609.32	46.090	2.641E-01	BI214
912.31	61.	19.11	1.03	3.917E-03				
970.05	27.	24.29	1.43	3.714E-03	968.90	17.460	PBC<MDA	AC228
1462.73	284.	5.93	1.94	2.618E-03	1460.75	10.700	7.776E+00	K40

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
1824.76	912.31	11.	69.	0.034	41.59	1.032	AC-228	s
1940.31	970.05	8.	27.	0.014	72.86	1.434	AC-228	s

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-212	153.63	77.03	395.	88.	0.044	97.86	1.500s
PB-214	153.80	77.11	447.	85.	0.043	110.22	1.500D
PB-212	153.80	77.11	447.	85.	0.043	110.22	1.500D
RA-226	371.81	186.10	174.	54.	0.027	102.71	1.500s
PB-212	477.56	238.97	127.	156.	0.078	39.05	1.500
PB-214	590.61	295.48	65.	60.	0.030	68.72	1.500
AC-228	677.23	338.78	52.	37.	0.018	96.90	1.500
PB-214	704.76	352.54	53.	73.	0.037	54.45	1.500
TL-208	1022.96	511.59	32.	52.	0.026	69.96	0.904s
TL-208	1168.78	584.47	26.	88.	0.044	47.50	1.459s
BI-214	1220.16	610.15	34.	90.	0.045	47.80	1.686
K-40	2926.50	1462.80	3.	274.	0.137	18.34	2.042

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

Nuclide Name	Nuclide Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	Peak MDA Value pCi/gm	COMMENTS
BE-7		4.5976E-02					
			477.56	4.598E-02	%(	2.535E-01 7.17E-02	G
K-40		7.4998E+00					
			1460.75	7.500E+00	(P	3.090E-01 4.59E-01	G
MN-54		-1.6280E-03					
			834.81	-1.628E-03	%(P	4.332E-02 1.17E-02	G
CO-57		1.2276E-04					
			122.07	1.228E-04	%(	3.970E-02 1.16E-02	G K
			136.43	6.697E-02	%	3.100E-01 9.22E-02	G
CO-60		-4.3381E-03					
			1332.51	-4.338E-03	%(P	5.324E-02 1.43E-02	G K
			1173.23	-7.546E-04	&	5.869E-02 1.59E-02	G K

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
Sr-85	-7.3681E-03						
		514.00	-7.368E-03	%(	4.703E-02	1.36E-02	G
Kr-85	-1.6884E+02						
		513.99	-1.688E+02	%(	1.078E+03	3.12E+02	G
Y-88	8.7177E-04						
		1836.01	8.718E-04	%(P	3.891E-02	9.01E-03	G K
		898.02	1.190E-03	& P	4.535E-02	1.21E-02	G
NB-94	0.0000E+00						
		871.10	0.000E+00	&(	5.623E-02	1.55E-02	G K
		702.50	3.395E-03	%	3.519E-02	9.68E-03	G K
Ag-108M	7.5530E-03						
		722.95	7.553E-03	%(	4.046E-02	1.14E-02	G K
		614.37	-2.371E-02	% P	5.475E-02	1.65E-02	G
		433.93	-6.232E-03	&	3.506E-02	1.01E-02	G
CD-109	-3.5728E-02						
		88.04	-3.573E-02	%(P	1.773E+00	5.24E-01	G
SN-113	-7.4390E-03						
		391.71	-7.439E-03	%(	5.116E-02	1.47E-02	G K
		255.04	2.356E-01	%	1.415E+00	4.14E-01	G
SB-125	3.9747E-03						
		427.95	3.975E-03	%(P	7.964E-02	2.15E-02	G K
		600.77	2.142E-03	% P	1.945E-01	5.31E-02	G
		636.15	9.052E-02	% P	3.293E-01	9.56E-02	G
		463.51	8.878E-02	% P	3.277E-01	9.49E-02	G
		176.29	-1.161E-02	% P	3.644E-01	1.04E-01	G
I-131	-7.1208E-03						
		364.48	-7.121E-03	%(	4.100E-02	1.19E-02	G K
		636.97	1.624E-01	&	4.913E-01	1.44E-01	G
		284.29	-3.440E-02	%	5.225E-01	1.51E-01	G
CS-134	-6.0367E-03						
		604.66	-6.037E-03	&(	4.282E-02	1.22E-02	G K
		795.76	1.911E-02	%	3.927E-02	1.20E-02	G
		569.29	4.259E-02	%	1.731E-01	4.94E-02	G
		801.84	6.435E-02	% P	4.096E-01	1.14E-01	G
CS-137	1.8059E-02						
		661.62	1.806E-02	%(	3.573E-02	1.10E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CE-139	-4.9786E-03						
		165.85	-4.979E-03	&(P	3.935E-02	1.16E-02	G
EU-152	-2.9556E-03						
		121.78	-2.956E-03	%(P	1.140E-01	3.33E-02	G K
		344.30	6.926E-03	%	1.162E-01	3.32E-02	G
		1408.08	-4.834E-02	%	2.327E-01	6.48E-02	G
		964.00	-9.871E-04	% P	3.181E-01	8.46E-02	G
		1112.07	-2.109E-02	%	4.315E-01	1.18E-01	G
		778.90	5.154E-02	% P	2.521E-01	7.06E-02	G
EU-154	2.3238E-03						
		123.10	2.324E-03	%(P	8.127E-02	2.38E-02	G K
		1274.80	1.172E-02	&	1.605E-01	4.37E-02	G
		723.30	5.151E-03	% P	2.215E-01	6.08E-02	G
		1004.80	-3.100E-02	&	2.800E-01	7.75E-02	G
EU-155	3.4695E-02						
		86.45	3.469E-02	&(P	2.154E-01	6.42E-02	G K
		105.31	2.450E-03	%	2.070E-01	6.10E-02	G
HG-203	9.4812E-03						
		279.17	9.481E-03	&(P	3.457E-02	1.02E-02	G K
		72.87	-5.780E-01	%	1.728E+00	5.20E-01	G
		70.83	3.106E-02	%	3.247E+00	9.62E-01	G
		82.50	-1.150E-01	%	3.059E+00	9.04E-01	G
TL-208	1.3346E-01						
		583.14	1.335E-01	@(P	4.015E-02	2.13E-02	G
		510.72	2.637E-01	+	1.489E-01	6.16E-02	G
PB-212	2.0092E-01						
		238.63	2.009E-01	(	7.140E-02	2.62E-02	G K
							Energy duplication
		77.11	3.919E-01	+	4.658E-01	1.44E-01	G
		74.81	7.926E-01	& P	8.622E-01	2.67E-01	G
PB-214	1.7529E-01						
		351.99	1.570E-01	(P	7.848E-02	2.86E-02	G K
		295.22	2.106E-01	(	1.410E-01	4.82E-02	G
							Energy duplication
		77.11	6.410E-01	+	7.619E-01	2.35E-01	G
		241.92	7.902E-02	%	4.765E-01	1.41E-01	G
BI-212	1.4808E-01						
		727.17	1.481E-01	%(	3.430E-01	1.03E-01	G K
		1620.56	-3.911E-02	% P	2.552E+00	6.72E-01	G
		785.42	4.779E-01	% P	1.936E+00	5.55E-01	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments

BI-214       2.6407E-01
                          609.32 2.641E-01  (  8.876E-02 4.21E-02 G K
                         1764.51-1.879E-03 % P 1.598E-01 2.17E-02 G
                         1120.28-4.591E-02 &   4.616E-01 1.30E-01 G

RA-224      -6.5283E-03
                          241.00-6.528E-03 %(P 9.037E-01 2.62E-01 G

RA-226       7.7441E-01
                          185.99 7.744E-01 @(P 9.245E-01 2.87E-01 G

AC-228       3.1687E-02
                          911.07-5.192E-02 %(P 1.924E-01 5.58E-02 G K
                          968.90-4.105E-04 % P 3.795E-01 1.05E-01 G
                          338.40 2.336E-01  (  2.309E-01 7.54E-02 G

TH-227      -3.7193E-02
                          236.00-3.719E-02 &(P 3.156E-01 9.26E-02 G K
                          256.25 9.737E-02 &   4.379E-01 1.29E-01 G

PA-234      -1.0673E-02
                           98.44-1.067E-02 &(  2.127E-01 6.30E-02 G K
                          946.00 2.244E-03 %   2.162E-01 5.75E-02 G
                          131.28 1.971E-02 %   1.596E-01 4.71E-02 G
                           94.67 2.724E-02 %   3.498E-01 1.04E-01 G
                          883.24 2.946E-02 &   3.717E-01 1.02E-01 G
                          926.70 3.162E-03 %   3.852E-01 1.02E-01 G
                          569.26 6.086E-02 %   2.587E-01 7.37E-02 G

TH-234       6.1552E-01
                           63.29 6.155E-01 %(P 4.037E+00 1.20E+00 G K
                           92.80 9.195E-01 %   2.015E+00 6.10E-01 G
                           92.38-2.473E-03 % P 2.528E+00 7.48E-01 G

AM-241      -8.1849E-02
                           59.54-8.185E-02 &(  6.163E-01 1.83E-01 G
   ( - This peak used in the nuclide activity average.

   * - Peak is too wide, but only one peak in library.
   ! - Peak is part of a multiplet and this area went
       negative during deconvolution.
   ? - Peak is too narrow.
   @ - Peak is too wide at FW25M, but ok at FWHM.
   % - Peak fails sensitivity test.
   $ - Peak identified, but first peak of this nuclide
       failed one or more qualification tests.
```

+ - Peak activity higher than counting uncertainty range.
- - Peak activity lower than counting uncertainty range.
= - Peak outside analysis energy range.
& - Calculated peak centroid is not close enough to the library energy centroid for positive identification.
P - Peakbackground subtraction
} - Peak is too close to another for the activity to be found directly.

Nuclide Codes:
T - Thermal Neutron Activation
F - Fast Neutron Activation
I - Fission Product
N - Naturally Occurring Isotope
P - Photon Reaction
C - Charged Particle Reaction
M - No MDA Calculation
R - Coincidence Corrected
H - Halflife limit exceeded

Peak Codes:
G - Gamma Ray
X - X-Ray
P - Positron Decay
S - Single-Escape
D - Double-Escape
K - Key Line
A - Not in Average
C - Coincidence Peak

- -

***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	4.5563E-02	4.5976E-02	2.1516E-01	2.1517E-01	2.512E-01
K-40		7.4998E+00	7.4998E+00	1.3762E+00	1.4391E+00	3.090E-01
MN-54	#A	-1.6254E-03	-1.6280E-03	5.6992E-02	5.6992E-02	4.326E-02
CO-57	#B	1.2254E-04	1.2276E-04	3.4837E-02	3.4837E-02	3.963E-02
CO-60	#B	-4.3370E-03	-4.3381E-03	4.7234E-02	4.7234E-02	5.323E-02
Sr-85	#A	-7.3134E-03	-7.3681E-03	4.0890E-02	4.0892E-02	4.668E-02
Kr-85	#A	-1.6884E+02	-1.6884E+02	9.3698E+02	9.3703E+02	1.078E+03
Y-88	#B	8.6783E-04	8.7177E-04	2.7018E-02	2.7018E-02	3.873E-02
NB-94	#B	0.0000E+00	0.0000E+00	4.6545E-02	4.6545E-02	5.623E-02
Ag-108M	#B	7.5529E-03	7.5530E-03	3.4280E-02	3.4283E-02	4.046E-02
CD-109	#A	-3.5690E-02	-3.5728E-02	8.3488E+00	8.3488E+00	1.771E+00
SN-113	#B	-7.4078E-03	-7.4390E-03	4.4227E-02	4.4229E-02	5.094E-02
SB-125	#B	3.9728E-03	3.9747E-03	6.4634E-02	6.4634E-02	7.960E-02
I-131	#B	-6.7060E-03	-7.1208E-03	3.5654E-02	3.5656E-02	3.861E-02
CS-134	#B	-6.0328E-03	-6.0367E-03	3.6615E-02	3.6616E-02	4.280E-02
CS-137	#A	1.8058E-02	1.8059E-02	3.2862E-02	3.2877E-02	3.573E-02
CE-139	#A	-4.9611E-03	-4.9786E-03	3.8376E-02	3.8377E-02	3.921E-02
EU-152	#B	-2.9553E-03	-2.9556E-03	2.7256E-01	2.7256E-01	1.140E-01
EU-154	#B	2.3234E-03	2.3238E-03	7.1366E-02	7.1367E-02	8.126E-02
EU-155	#B	3.4685E-02	3.4695E-02	1.9251E-01	1.9252E-01	2.153E-01
HG-203	#B	9.3835E-03	9.4812E-03	3.0637E-02	3.0642E-02	3.421E-02
TL-208	#	1.3346E-01	1.3346E-01	6.3687E-02	6.4126E-02	
PB-212	#	2.0092E-01	2.0092E-01	7.8467E-02	7.9273E-02	7.140E-02
PB-214	#	1.7529E-01	1.7529E-01	7.7001E-02	7.7627E-02	7.848E-02
BI-212	#B	1.4808E-01	1.4808E-01	3.0956E-01	3.0967E-01	3.430E-01

BI-214	2.6407E-01	2.6407E-01	1.2622E-01	1.2709E-01

RA-224	#A	-6.5283E-03	-6.5283E-03	1.7953E+00	1.7953E+00	9.037E-01
RA-226	#A	7.7441E-01	7.7441E-01	8.6135E-01	8.6244E-01	9.245E-01
AC-228	#B	3.1687E-02	3.1687E-02	3.0706E-02	3.0757E-02	1.924E-01
TH-227	#B	-3.7193E-02	-3.7193E-02	2.9964E-01	2.9964E-01	3.156E-01
PA-234	#B	-1.0673E-02	-1.0673E-02	1.8893E-01	1.8893E-01	2.127E-01
TH-234	#B	6.1552E-01	6.1552E-01	3.6063E+00	3.6064E+00	4.037E+00
AM-241	#A	-8.1849E-02	-8.1849E-02	5.5015E-01	5.5017E-01	6.163E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (50.2 to 1999.0 keV) 7.8973064E+00 pCi/gm
Total Decayed Activity (50.2 to 1999.0 keV) 7.8973064E+00 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JPK

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 103_21AUG2006_1340.An1

Sample description
OOL-05-04-070-F-S WET

Spectrum Filename: C:\GammaVision\Spectra\103_21AUG2006_1340.An1

Acquisition information
Start time: 21-Aug-2006 13:40:22
Live time: 2000
Real time: 2002
Dead time: 0.10 %
Detector ID: 4

Detector system
Det 103 - DSPE-471

Calibration
Filename: D3_1LSa.Clb
Detector_103 1.0 Liter Sand Geometry

Energy Calibration
Created: 08-Aug-2005 11:09:41
Zero offset: 0.409 keV
Gain: 0.500 keV/channel
Quadratic: 1.092E-08 keV/channel^2

Efficiency Calibration
Created: 08-Aug-2005 11:11:25
Type: Polynomial
Uncertainty: 0.993 %
Coefficients: -0.264059 -5.138468 0.638383
-0.089199 0.005011 -0.000129

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.41keV)
Stop channel: 4000 (2000.67keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 1.9830E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.9830E+03) =
5.0429E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	19-Aug-2006 13:13:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	103_150K_05AUG05.Pbc 08-Aug-2005 12:54:15
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 18 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.1222

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
74.22	69.	40.65	0.99	8.807E-03	74.81	9.600	PBC<MDA	PB212
77.34	175.	14.33	0.99	1.025E-02	77.11	10.700	1.086E+00	PB214
					77.11	17.500	6.638E-01	PB212
93.03	82.	41.08	1.50	1.631E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
186.23	119.	29.52	0.93	2.566E-02	185.99	3.280	PBC<MDA	RA226
209.41	88.	35.19	0.67	2.471E-02				
238.71	948.	3.77	1.09	2.320E-02	238.63	43.100	6.382E-01	PB212
241.79	142.	17.38	1.09	2.303E-02	241.00	3.900	1.075E+00	RA224
					241.92	7.470	5.622E-01	PB214
270.56	124.	26.22	0.74	2.149E-02				
295.32	227.	9.84	1.13	2.025E-02	295.22	19.200	3.908E-01	PB214
300.03	50.	35.64	1.13	2.002E-02				
338.28	199.	14.31	0.98	1.831E-02	338.40	12.010	6.148E-01	AC228
351.98	446.	6.38	1.11	1.775E-02	351.99	37.100	4.554E-01	PB214
463.33	58.	27.60	1.80	1.425E-02				
463.33	58.	27.60	1.80	1.425E-02	463.51	10.000	2.693E-01	SB125
511.12	156.	16.88	1.12	1.316E-02	510.72	22.500	2.962E-01	TL208
583.32	284.	7.77	1.21	1.184E-02	583.14	86.000	1.871E-01	TL208
609.38	307.	7.83	1.26	1.144E-02	609.32	46.090	3.883E-01	BI214
727.61	94.	25.27	1.24	9.960E-03	727.17	11.800	5.408E-01	BI212
767.86	91.	23.37	1.84	9.557E-03				
795.31	34.	34.62	1.50	9.301E-03	795.76	85.400	PBC<MDA	CS134
860.94	49.	29.38	1.13	8.765E-03				
911.36	219.	8.79	1.57	8.399E-03	911.07	29.000	6.031E-01	AC228
964.41	36.	27.62	1.54	8.054E-03				
969.35	114.	12.14	1.54	8.023E-03	968.90	17.460	5.520E-01	AC228

1120.52	77.	16.23	2.01	7.211E-03	1120.28	15.040	4.719E-01	BI214
1460.99	1145.	3.03	1.95	5.931E-03	1460.75	10.700	1.210E+01	K40
1764.80	56.	13.02	2.00	5.142E-03	1764.51	15.920	4.639E-01	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
417.98	209.41	400.	88.	0.044	105.56	0.666	AC-228	
540.28	270.56	348.	124.	0.062	78.65	0.738	AC-228	s
599.16	300.00	155.	58.	0.029	99.22	0.961	PB-212	
1534.79	767.86	97.	91.	0.045	70.12	1.836	BI-214	sM
1720.91	860.94	58.	49.	0.025	88.15	1.130	TL-208	
1928.56	964.36	30.	42.	0.021	71.74	1.538	AC-228	D

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.
M - Peak is close to a library peak.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-212	148.79	74.81	291.	120.	0.060	64.15	0.993D
PB-212	153.39	77.11	290.	149.	0.074	42.43	0.995A
RA-226	371.72	186.28	660.	113.	0.057	89.71	1.500
PB-212	476.72	238.78	569.	841.	0.420	16.46	1.061
RA-224	482.58	241.71	577.	148.	0.074	73.35	1.500
PB-214	482.87	241.86	663.	104.	0.052	109.13	1.500s
PB-214	589.72	295.29	237.	227.	0.114	36.94	1.064
AC-228	675.70	338.28	221.	198.	0.099	42.93	0.980
PB-214	703.10	351.98	157.	440.	0.220	19.14	1.111
SB-125	925.03	462.95	101.	57.	0.028	83.33	1.500s
TL-208	1021.35	511.12	179.	129.	0.064	50.65	1.116s
TL-208	1165.74	583.32	85.	280.	0.140	23.30	1.207
BI-214	1217.85	609.38	100.	300.	0.150	23.48	1.260
BI-212	1454.29	727.61	124.	93.	0.047	75.82	1.242s
CS-134	1589.67	795.31	54.	34.	0.017	103.86	1.500s
AC-228	1821.75	911.36	57.	216.	0.108	26.36	1.569
AC-228	1936.81	968.90	34.	114.	0.057	35.56	1.541D
BI-214	2240.02	1120.52	38.	75.	0.038	48.69	2.009s
K-40	2920.85	1460.99	32.	1127.	0.563	9.09	1.949
BI-214	3528.35	1764.80	3.	56.	0.028	39.06	2.000

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	Peak MDA Value pCi/gm	COMMENTS
BE-7		1.1014E-01					
			477.56	1.101E-01	%(	2.800E-01 8.42E-02	G
K-40		1.2097E+01					
			1460.75	1.210E+01	(P	3.135E-01 3.73E-01	G
MN-54		-4.6662E-04					
			834.81	-4.666E-04	%(P	3.086E-02 8.72E-03	G
CO-57		-3.3287E-04					
			122.07	-3.329E-04	%(P	3.295E-02 9.72E-03	G K
			136.43	1.097E-02	%	3.494E-01 1.04E-01	G
CO-60		-6.5190E-03					
			1332.51	-6.519E-03	%(P	3.576E-02 9.86E-03	G K
			1173.23	-1.763E-03	% P	3.708E-02 1.03E-02	G K
Sr-85		-1.1698E-02					
			514.00	-1.170E-02	&(	3.764E-02 1.13E-02	G
Kr-85		-2.6453E+02					
			513.99	-2.645E+02	&(	8.504E+02 2.54E+02	G
Y-88		-2.8208E-03					
			1836.01	-2.821E-03	%(P	2.218E-02 5.89E-03	G K
			898.02	2.284E-03	& P	3.086E-02 8.74E-03	G
NB-94		-2.2749E-03					
			871.10	-2.275E-03	%(	2.740E-02 7.79E-03	G K
			702.50	-4.802E-03	%	3.294E-02 9.62E-03	G K
Ag-108M		5.3261E-03					
			722.95	5.326E-03	%(	2.698E-02 7.83E-03	G K
			614.37	-8.196E-03	% P	3.684E-02 1.09E-02	G
			433.93	-7.383E-03	%	3.299E-02 9.79E-03	G
CD-109		3.0804E-03					
			88.04	3.080E-03	%(	1.649E+00 4.91E-01	G
SN-113		-5.7233E-06					
			391.71	-5.723E-06	&(	3.864E-02 1.12E-02	G K
			255.04	2.385E-01	&	1.401E+00 4.17E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	5.1219E-02						
		427.95	-2.303E-02	&(P	9.812E-02	2.91E-02	G K
		600.77	-1.120E-02	& P	1.568E-01	4.54E-02	G
		636.15	-7.129E-02	% P	2.642E-01	7.79E-02	G
		463.51	2.710E-01	*(P	2.378E-01	7.70E-02	G
		176.29	3.573E-02	%	4.480E-01	1.33E-01	G
I-131	2.7831E-04						
		364.48	2.783E-04	%(P	3.786E-02	1.10E-02	G K
		636.97	-1.168E-01	%	4.438E-01	1.31E-01	G
		284.29	1.202E-02	% P	5.734E-01	1.69E-01	G
CS-134	1.4088E-02						
		604.66	6.470E-04	%(	6.485E-02	1.92E-02	G K
		795.76	2.945E-02	(P	3.166E-02	1.02E-02	G
		569.29	1.429E-02	% P	1.708E-01	4.91E-02	G
		801.84	-4.837E-03	& P	4.048E-01	1.15E-01	G
CS-137	1.9863E-02						
		661.62	1.986E-02	%(P	3.600E-02	1.10E-02	G
CE-139	-8.4943E-03						
		165.85	-8.494E-03	%(	4.221E-02	1.27E-02	G
EU-152	1.4353E-03						
		121.78	1.435E-03	&(P	1.348E-01	4.01E-02	G K
		344.30	-1.882E-02	% P	1.034E-01	3.06E-02	G
		1408.08	4.531E-02	%	1.321E-01	3.90E-02	G
		964.00	-1.345E-01	% P	2.833E-01	8.56E-02	G
		1112.07	-2.039E-02	&	2.415E-01	6.86E-02	G
		778.90	2.194E-02	%	1.993E-01	5.70E-02	G
EU-154	8.2946E-03						
		123.10	8.295E-03	%(	8.492E-02	2.53E-02	G K
		1274.80	3.263E-02	%	9.685E-02	2.87E-02	G
		723.30	0.000E+00	&	2.532E-01	7.40E-02	G
		1004.80	3.878E-02	&	1.473E-01	4.29E-02	G
EU-155	3.8444E-02						
		86.45	3.844E-02	%(	1.788E-01	5.36E-02	G K
		105.31	3.447E-03	%	2.071E-01	6.16E-02	G
HG-203	-5.6839E-03						
		279.17	-5.684E-03	&(P	4.004E-02	1.19E-02	G K
		72.87	-6.286E-01	% P	2.027E+00	6.11E-01	G
		70.83	9.662E-01	%	2.780E+00	8.37E-01	G
		82.50	4.823E-01	%	3.271E+00	9.78E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	1.8711E-01						
		583.14	1.871E-01	(P	3.061E-02	1.48E-02	G
		510.72	2.962E-01	+ P	1.497E-01	6.04E-02	G
PB-212	5.7308E-01						
		238.63	5.731E-01	(P	7.762E-02	3.19E-02	G K
							Energy duplication
		77.11	5.731E-01	} P	3.160E-01	8.10E-02	G
		74.81	9.450E-01	+ P	6.441E-01	2.07E-01	G
PB-214	4.3326E-01						
		351.99	4.554E-01	(P	6.319E-02	2.94E-02	G K
		295.22	3.987E-01	(P	1.304E-01	5.00E-02	G
							Energy duplication
		77.11	0.000E+00	} P	7.600E-01	0.00E+00	G
		241.92	4.121E-01	(	4.864E-01	1.50E-01	G
BI-212	5.4076E-01						
		727.17	5.408E-01	(P	3.161E-01	1.37E-01	G K
		1620.56	1.042E-01	% P	8.618E-01	2.34E-01	G
		785.42	4.533E-01	%	1.633E+00	4.83E-01	G
BI-214	4.2025E-01						
		609.32	3.883E-01	(P	6.361E-02	3.10E-02	G K
		1764.51	4.639E-01	(P	9.274E-02	6.40E-02	G
		1120.28	4.719E-01	(P	1.973E-01	7.85E-02	G
RA-224	1.1174E+00						
		241.00	1.117E+00	(	8.682E-01	2.73E-01	G
RA-226	9.1491E-01						
		185.99	9.149E-01	(P	9.907E-01	3.05E-01	G
AC-228	5.9057E-01						
		911.07	6.031E-01	(P	1.063E-01	5.38E-02	G K
		968.90	5.530E-01	(P	1.459E-01	6.56E-02	G
		338.40	6.148E-01	(P	2.230E-01	8.84E-02	G
TH-227	-7.7060E-02						
		236.00	-7.706E-02	%(	3.204E-01	9.62E-02	G K
		256.25	5.703E-03	& P	4.172E-01	1.23E-01	G
PA-234	2.1632E-02						
		98.44	2.163E-02	%(P	1.724E-01	5.14E-02	G K
		946.00	1.473E-02	& P	1.578E-01	4.51E-02	G
		131.28	-2.207E-02	% P	1.835E-01	5.48E-02	G
		94.67	-6.208E-03	% P	2.543E-01	7.51E-02	G
		883.24	-3.840E-03	&	2.223E-01	6.22E-02	G
		926.70	2.215E-03	%	3.155E-01	8.97E-02	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26 2.094E-02 % P 2.530E-01 7.28E-02 G

TH-234       1.4633E+00
                           63.29 1.463E+00 %(P 5.144E+00 1.54E+00 G K
                           92.80 1.084E+00 % P 1.843E+00 5.58E-01 G
                           92.38 1.327E+00 & P 2.187E+00 6.63E-01 G

AM-241       2.4494E-02
                           59.54 2.449E-02 %(P 9.634E-01 2.86E-01 G
   ( - This peak used in the nuclide activity average.

   * - Peak is too wide, but only one peak in library.
   ! - Peak is part of a multiplet and this area went
       negative during deconvolution.
   ? - Peak is too narrow.
   @ - Peak is too wide at FW25M, but ok at FWHM.
   % - Peak fails sensitivity test.
   $ - Peak identified, but first peak of this nuclide
       failed one or more qualification tests.
   + - Peak activity higher than counting uncertainty range.
   - - Peak activity lower than counting uncertainty range.
   = - Peak outside analysis energy range.
   & - Calculated peak centroid is not close enough to the
       library energy centroid for positive identification.
   P - Peakbackground subtraction
   } - Peak is too close to another for the activity
       to be found directly.

   Nuclide Codes:                      Peak Codes:
   T - Thermal Neutron Activation      G - Gamma Ray
   F - Fast Neutron Activation         X - X-Ray
   I - Fission Product                 P - Positron Decay
   N - Naturally Occurring Isotope     S - Single-Escape
   P - Photon Reaction                 D - Double-Escape
   C - Charged Particle Reaction       K - Key Line
   M - No MDA Calculation              A - Not in Average
   R - Coincidence Corrected           C - Coincidence Peak
   H - Halflife limit exceeded

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
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***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	1.0729E-01	1.1014E-01	2.5268E-01	2.5276E-01	2.728E-01
K-40		1.2097E+01	1.2097E+01	1.1182E+00	1.3204E+00	
MN-54	#A	-4.6453E-04	-4.6662E-04	9.9990E-02	9.9990E-02	3.072E-02
CO-57	#B	-3.3115E-04	-3.3287E-04	7.5320E-02	7.5320E-02	3.278E-02
CO-60	#B	-6.5143E-03	-6.5190E-03	7.5331E-02	7.5332E-02	3.573E-02

Sr-85	#A	-1.1448E-02	-1.1698E-02	3.3790E-02	3.3796E-02	3.683E-02
Kr-85	#A	-2.6453E+02	-2.6453E+02	7.6346E+02	7.6361E+02	8.503E+02
Y-88	#B	-2.7841E-03	-2.8208E-03	1.8819E-02	1.8820E-02	2.189E-02
NB-94	#B	-2.2749E-03	-2.2749E-03	2.3361E-02	2.3361E-02	2.740E-02
Ag-108M	#B	5.3260E-03	5.3261E-03	2.3492E-02	2.3494E-02	2.698E-02
CD-109	#A	3.0709E-03	3.0804E-03	1.4716E+00	1.4716E+00	1.644E+00
SN-113	#B	-5.6541E-06	-5.7233E-06	3.3556E-02	3.3556E-02	3.817E-02
SB-125	#B	5.1148E-02	5.1219E-02	4.3640E-02	4.3741E-02	9.799E-02
I-131	#B	2.3385E-04	2.7831E-04	3.3031E-02	3.3031E-02	3.181E-02
CS-134	#B	1.4062E-02	1.4088E-02	1.4669E-02	1.4692E-02	6.473E-02
CS-137	#A	1.9860E-02	1.9863E-02	3.2916E-02	3.2936E-02	3.600E-02
CE-139	#A	-8.4083E-03	-8.4943E-03	3.7952E-02	3.7955E-02	4.179E-02
EU-152	#B	1.4349E-03	1.4353E-03	1.2032E-01	1.2032E-01	1.348E-01
EU-154	#B	8.2909E-03	8.2946E-03	7.5905E-02	7.5907E-02	8.488E-02
EU-155	#B	3.8414E-02	3.8444E-02	1.6072E-01	1.6073E-01	1.786E-01
HG-203	#B	-5.5158E-03	-5.6839E-03	3.5939E-02	3.5941E-02	3.886E-02
TL-208		1.8711E-01	1.8711E-01	4.4267E-02	4.5581E-02	
PB-212		5.7308E-01	5.7308E-01	9.5688E-02	1.0131E-01	
PB-214		4.3326E-01	4.3326E-01	8.3975E-02	8.7662E-02	
BI-212	#	5.4076E-01	5.4076E-01	4.1217E-01	4.1336E-01	
BI-214		4.2025E-01	4.2025E-01	9.6822E-02	9.9849E-02	
RA-224		1.1174E+00	1.1174E+00	8.1964E-01	8.2220E-01	8.682E-01
RA-226	#A	9.1491E-01	9.1491E-01	9.1487E-01	9.1641E-01	9.907E-01
AC-228		5.9057E-01	5.9057E-01	1.2211E-01	1.2683E-01	
TH-227	#B	-7.7060E-02	-7.7060E-02	2.8847E-01	2.8850E-01	3.204E-01
PA-234	#B	2.1632E-02	2.1632E-02	1.5414E-01	1.5415E-01	1.724E-01
TH-234	#B	1.4633E+00	1.4633E+00	4.6238E+00	4.6245E+00	5.144E+00
AM-241	#A	2.4494E-02	2.4494E-02	8.5750E-01	8.5750E-01	9.634E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (1078.5 to 2000.7 keV) 1.5959001E+01 pCi/gm
Total Decayed Activity (1078.5 to 2000.7 keV) 1.5959001E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JPK

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 103F_21AUG2006_1510.An1

Sample description
FSS-OOL-05-04-083-F-A

Spectrum Filename: C:\GammaVision\Spectra\103F_21AUG2006_1510.An1

Acquisition information
Start time: 21-Aug-2006 15:10:36
Live time: 2000
Real time: 2001
Dead time: 0.07 %
Detector ID: 4

Detector system
Det 103 - DSPE-471

Calibration
Filename: D3_1LSa.Clb
Detector_103 1.0 Liter Sand Geometry

Energy Calibration
Created: 08-Aug-2005 11:09:41
Zero offset: 0.409 keV
Gain: 0.500 keV/channel
Quadratic: 1.092E-08 keV/channel^2

Efficiency Calibration
Created: 08-Aug-2005 11:11:25
Type: Polynomial
Uncertainty: 0.993 %
Coefficients: -0.264059 -5.138468 0.638383
-0.089199 0.005011 -0.000129

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.41keV)
Stop channel: 4000 (2000.67keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 1.7960E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.7960E+03) =
5.5679E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	19-Aug-2006 13:30:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	103_150K_05AUG05.Pbc 08-Aug-2005 12:54:15
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 13 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.1712

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
74.85	81.	25.88	0.99	9.100E-03	74.81	9.600	6.787E-01	PB212
77.22	163.	15.55	0.99	1.019E-02	77.11	17.500	6.784E-01	PB212
					77.11	10.700	1.109E+00	PB214
186.51	132.	25.16	1.36	2.565E-02	185.99	3.280	1.068E+00	RA226
209.95	76.	37.81	1.14	2.468E-02				
238.80	644.	4.71	1.09	2.319E-02	238.63	43.100	4.752E-01	PB212
242.02	93.	22.54	1.10	2.302E-02	241.00	3.900	7.756E-01	RA224
					241.92	7.470	4.058E-01	PB214
270.19	54.	37.44	0.74	2.151E-02				
295.41	192.	10.64	1.08	2.024E-02	295.22	19.200	3.641E-01	PB214
300.59	75.	23.23	1.11	1.999E-02				
338.48	194.	13.28	1.23	1.830E-02	338.40	12.010	6.597E-01	AC228
352.03	348.	7.80	1.11	1.775E-02	351.99	37.100	3.917E-01	PB214
463.31	48.	34.66	1.04	1.425E-02				
463.31	48.	34.66	1.04	1.425E-02	463.51	10.000	PBC<MDA	SB125
510.88	119.	16.45	1.02	1.317E-02	510.72	22.500	2.354E-01	TL208
583.40	244.	8.49	1.41	1.184E-02	583.14	86.000	1.773E-01	TL208
609.46	286.	7.39	1.53	1.144E-02	609.32	46.090	3.995E-01	BI214
727.17	61.	27.37	1.51	9.965E-03	727.17	11.800	3.891E-01	BI212
768.20	55.	29.93	1.09	9.554E-03				
794.80	29.	31.89	1.50	9.301E-03	795.76	85.400	2.708E-02	CS134
860.88	44.	26.89	1.30	8.765E-03				
911.54	135.	10.07	1.69	8.398E-03	911.07	29.000	4.071E-01	AC228
964.64	34.	25.46	1.54	8.052E-03				
969.37	78.	14.34	1.54	8.023E-03	968.90	17.460	4.191E-01	AC228
1120.89	39.	25.75	1.63	7.212E-03	1120.28	15.040	2.735E-01	BI214
1461.26	702.	3.92	1.95	5.930E-03	1460.75	10.700	8.103E+00	K40

1765.42	48.	15.59	1.02	5.140E-03	1764.51	15.920	4.084E-01	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
419.05	209.95	322.	76.	0.038	113.43	1.144	NP-239	s
539.53	270.19	172.	54.	0.027	112.31	0.742	AC-228	
600.32	300.59	103.	75.	0.037	69.68	1.109	PB-212	
1535.45	768.20	67.	52.	0.026	78.51	1.091	BI-214	M
1720.81	860.88	32.	44.	0.022	80.67	1.301	TL-208	
1929.10	964.67	22.	33.	0.016	80.34	1.538	AC-228	D

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.
M - Peak is close to a library peak.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-212	148.79	74.81	216.	79.	0.039	82.54	0.993D
PB-212	153.39	77.11	241.	103.	0.051	6.14	0.995A
RA-226	371.93	186.38	477.	115.	0.058	76.21	1.500s
PB-212	476.71	238.78	463.	580.	0.290	21.30	0.967
RA-224	482.88	241.86	465.	84.	0.042	113.56	1.500
PB-214	589.98	295.41	112.	188.	0.094	31.93	1.075
AC-228	676.11	338.48	152.	193.	0.096	39.84	1.234
PB-214	703.19	352.03	150.	343.	0.171	23.40	1.105
SB-125	925.40	463.14	90.	42.	0.021	102.75	1.500
TL-208	1020.87	510.88	125.	93.	0.046	49.34	1.025s
TL-208	1165.91	583.40	71.	240.	0.120	25.48	1.409
BI-214	1218.10	609.50	45.	281.	0.141	19.94	1.500
BI-212	1453.41	727.17	67.	61.	0.030	82.10	1.506s
CS-134	1588.66	794.80	27.	29.	0.014	95.68	1.500s
AC-228	1822.10	911.54	26.	132.	0.066	30.21	1.686
AC-228	1936.81	968.90	28.	78.	0.039	44.49	1.541D
BI-214	2240.75	1120.89	38.	39.	0.020	77.26	1.634
K-40	2921.39	1461.26	30.	684.	0.342	11.77	1.946
BI-214	3528.80	1765.02	14.	30.	0.015	65.78	2.033s

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	MDA Value pCi/gm	COMMENTS
BE-7		3.6973E-02					
			477.56	3.697E-02	%(	2.757E-01 8.05E-02	G
K-40		8.1034E+00					
			1460.75	8.103E+00	(P	3.368E-01 3.27E-01	G
MN-54		7.6004E-03					
			834.81	7.600E-03	%(P	2.472E-02 7.25E-03	G
CO-57		1.1176E-02					
			122.07	1.118E-02	%(P	4.249E-02 1.28E-02	G K
			136.43	-5.207E-03	%	3.113E-01 9.22E-02	G
CO-60		-4.2954E-03					
			1332.51	-4.295E-03	&(P	3.441E-02 9.14E-03	G K
			1173.23	-3.372E-03	% P	3.524E-02 9.64E-03	G K
Sr-85		-1.3740E-02					
			514.00	-1.374E-02	%(	3.691E-02 1.11E-02	G
Kr-85		-3.1002E+02					
			513.99	-3.100E+02	%(	8.333E+02 2.50E+02	G
Y-88		-9.6950E-05					
			1836.01	-9.695E-05	%(P	2.520E-02 6.36E-03	G K
			898.02	-3.158E-03	% P	2.902E-02 8.10E-03	G
NB-94		3.0784E-03					
			871.10	3.078E-03	%(	2.815E-02 8.00E-03	G K
			702.50	1.025E-02	%	2.842E-02 8.48E-03	G K
Ag-108M		-4.0938E-03					
			722.95	-4.094E-03	%(	3.926E-02 1.14E-02	G K
			614.37	-4.335E-03	& P	2.918E-02 8.43E-03	G
			433.93	-4.838E-03	%	3.151E-02 9.25E-03	G
CD-109		4.3201E-02					
			88.04	4.320E-02	%(	1.750E+00 5.20E-01	G
SN-113		1.4108E-02					
			391.71	1.411E-02	&(	4.259E-02 1.27E-02	G K
			255.04	9.655E-02	&	1.360E+00 4.01E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	5.7296E-02						
		427.95	1.551E-03	%(P	9.540E-02	2.76E-02	G K
		600.77	1.634E-02	& P	1.501E-01	4.33E-02	G
		636.15	-1.100E-02	& P	2.455E-01	6.95E-02	G
		463.51	2.223E-01	(P	2.477E-01	7.84E-02	G
		176.29	0.000E+00	%	4.956E-01	1.47E-01	G
I-131	-8.8096E-03						
		364.48	-8.810E-03	%(P	3.832E-02	1.13E-02	G K
		636.97	3.416E-02	&	4.796E-01	1.38E-01	G
		284.29	5.108E-03	% P	4.654E-01	1.35E-01	G
CS-134	1.5982E-02						
		604.66	6.269E-03	&(	2.458E-02	7.20E-03	G K
		795.76	2.708E-02	(P	2.574E-02	8.66E-03	G
		569.29	-6.141E-03	% P	1.499E-01	4.15E-02	G
		801.84	7.053E-03	% P	3.113E-01	8.63E-02	G
CS-137	1.8472E-02						
		661.62	1.847E-02	%(P	2.960E-02	9.12E-03	G
CE-139	3.0099E-03						
		165.85	3.010E-03	&(	3.918E-02	1.16E-02	G
EU-152	2.9899E-02						
		121.78	2.990E-02	%(P	1.141E-01	3.42E-02	G K
		344.30	7.226E-03	% P	8.343E-02	2.43E-02	G
		1408.08	5.445E-02	%	1.216E-01	3.67E-02	G
		964.00	1.030E-01	& P	2.124E-01	6.43E-02	G
		1112.07	8.086E-03	%	2.392E-01	6.68E-02	G
		778.90	3.708E-02	%	1.683E-01	4.84E-02	G
EU-154	2.2736E-02						
		123.10	2.274E-02	&(	8.727E-02	2.62E-02	G K
		1274.80	1.053E-02	%	9.749E-02	2.76E-02	G
		723.30	-2.003E-02	%	1.804E-01	5.24E-02	G
		1004.80	2.929E-03	&	1.767E-01	4.93E-02	G
EU-155	5.7242E-02						
		86.45	5.724E-02	%(	1.968E-01	5.92E-02	G K
		105.31	-4.065E-03	&	1.952E-01	5.79E-02	G
HG-203	-4.5515E-03						
		279.17	-4.552E-03	&(P	3.466E-02	1.02E-02	G K
		72.87	1.613E-01	& P	1.889E+00	5.63E-01	G
		70.83	-7.494E-03	%	2.914E+00	8.59E-01	G
		82.50	-6.238E-01	&	3.136E+00	9.38E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	1.7734E-01						
		583.14	1.773E-01	(P	3.099E-02	1.53E-02	G
		510.72	2.354E-01	+ P	1.393E-01	4.99E-02	G
PB-212	4.3634E-01						
		238.63	4.363E-01	(P	7.751E-02	3.16E-02	G K
							Energy duplication
		77.11	4.363E-01	} P	3.193E-01	8.93E-03	G
		74.81	6.826E-01	+ P	6.167E-01	1.95E-01	G
PB-214	3.8229E-01						
		351.99	3.917E-01	(P	6.833E-02	3.11E-02	G K
		295.22	3.641E-01	(P	1.006E-01	3.96E-02	G
							Energy duplication
		77.11	3.349E-01	} P	7.499E-01	1.91E-01	G
		241.92	2.293E-01	%	4.752E-01	1.44E-01	G
BI-212	3.8910E-01						
		727.17	3.891E-01	@(P	2.618E-01	1.07E-01	G K
		1620.56	-2.393E-02	& P	9.350E-01	2.45E-01	G
		785.42	2.214E-01	%	1.229E+00	3.53E-01	G
BI-214	4.0115E-01						
		609.32	4.012E-01	(P	4.862E-02	2.73E-02	G K
		1764.51	2.783E-01	- P	1.826E-01	6.76E-02	G
		1120.28	2.735E-01	- P	2.177E-01	7.38E-02	G
RA-224	7.0350E-01						
		241.00	7.035E-01	(	8.630E-01	2.66E-01	G
RA-226	1.0280E+00						
		185.99	1.028E+00	*(P	9.343E-01	2.91E-01	G
AC-228	4.1133E-01						
		911.07	4.071E-01	(P	8.199E-02	4.21E-02	G K
		968.90	4.183E-01	(P	1.472E-01	6.21E-02	G
		338.40	6.597E-01	+ P	2.061E-01	8.82E-02	G
TH-227	-1.2895E-01						
		236.00	-1.290E-01	%(	3.244E-01	9.80E-02	G K
		256.25	-6.746E-02	% P	4.314E-01	1.28E-01	G
PA-234	1.5534E-02						
		98.44	1.553E-02	&(P	1.910E-01	5.68E-02	G K
		946.00	4.724E-02	% P	1.092E-01	3.29E-02	G
		131.28	-1.522E-02	& P	1.815E-01	5.40E-02	G
		94.67	-7.009E-02	% P	3.569E-01	1.07E-01	G
		883.24	1.630E-04	&	2.090E-01	5.74E-02	G
		926.70	-4.996E-02	&	2.569E-01	7.40E-02	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26 6.154E-02 & P 2.264E-01 6.61E-02 G

TH-234       6.3232E-01
                           63.29 6.323E-01 %(P 5.531E+00 1.64E+00 G K
                           92.80 6.248E-01 % P 1.876E+00 5.62E-01 G
                           92.38 7.460E-01 % P 2.223E+00 6.66E-01 G

AM-241       2.3179E-02
                           59.54 2.318E-02 &(P 8.731E-01 2.58E-01 G
   ( - This peak used in the nuclide activity average.

   * - Peak is too wide, but only one peak in library.
   ! - Peak is part of a multiplet and this area went
       negative during deconvolution.
   ? - Peak is too narrow.
   @ - Peak is too wide at FW25M, but ok at FWHM.
   % - Peak fails sensitivity test.
   $ - Peak identified, but first peak of this nuclide
       failed one or more qualification tests.
   + - Peak activity higher than counting uncertainty range.
   - - Peak activity lower than counting uncertainty range.
   = - Peak outside analysis energy range.
   & - Calculated peak centroid is not close enough to the
       library energy centroid for positive identification.
   P - Peakbackground subtraction
   } - Peak is too close to another for the activity
       to be found directly.

   Nuclide Codes:                      Peak Codes:
   T - Thermal Neutron Activation      G - Gamma Ray
   F - Fast Neutron Activation         X - X-Ray
   I - Fission Product                 P - Positron Decay
   N - Naturally Occurring Isotope     S - Single-Escape
   P - Photon Reaction                 D - Double-Escape
   C - Charged Particle Reaction       K - Key Line
   M - No MDA Calculation              A - Not in Average
   R - Coincidence Corrected           C - Coincidence Peak
   H - Halflife limit exceeded

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
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***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	3.5992E-02	3.6973E-02	2.4148E-01	2.4149E-01	2.684E-01
K-40		8.1034E+00	8.1034E+00	9.8016E-01	1.0872E+00	
MN-54	#A	7.5656E-03	7.6004E-03	2.1738E-02	2.1743E-02	2.460E-02
CO-57	#B	1.1117E-02	1.1176E-02	3.8251E-02	3.8256E-02	4.227E-02
CO-60	#B	-4.2922E-03	-4.2954E-03	1.7639E-01	1.7639E-01	3.439E-02

Sr-85	#A	-1.3439E-02	-1.3740E-02	3.3265E-02	3.3275E-02	3.610E-02
Kr-85	#A	-3.1001E+02	-3.1002E+02	7.5096E+02	7.5117E+02	8.333E+02
Y-88	#B	-9.5654E-05	-9.6950E-05	2.4026E-03	2.4026E-03	2.487E-02
NB-94	#B	3.0784E-03	3.0784E-03	2.4000E-02	2.4000E-02	2.815E-02
Ag-108M	#B	-4.0936E-03	-4.0938E-03	3.4146E-02	3.4146E-02	3.926E-02
CD-109	#A	4.3064E-02	4.3201E-02	1.5613E+00	1.5613E+00	1.744E+00
SN-113	#B	1.3933E-02	1.4108E-02	3.8212E-02	3.8221E-02	4.207E-02
SB-125	#B	5.7215E-02	5.7296E-02	6.0658E-02	6.0749E-02	9.526E-02
I-131	#B	-7.3699E-03	-8.8096E-03	3.7504E-02	3.7508E-02	3.206E-02
CS-134	#B	1.5951E-02	1.5982E-02	1.5339E-02	1.5367E-02	2.453E-02
CS-137	#A	1.8469E-02	1.8472E-02	2.7372E-02	2.7393E-02	2.959E-02
CE-139	#A	2.9787E-03	3.0099E-03	3.4915E-02	3.4915E-02	3.878E-02
EU-152	#B	2.9890E-02	2.9899E-02	1.0256E-01	1.0258E-01	1.141E-01
EU-154	#B	2.2725E-02	2.2736E-02	7.8545E-02	7.8556E-02	8.723E-02
EU-155	#B	5.7197E-02	5.7242E-02	1.7752E-01	1.7755E-01	1.966E-01
HG-203	#B	-4.4135E-03	-4.5515E-03	3.0972E-02	3.0973E-02	3.360E-02
TL-208		1.7734E-01	1.7734E-01	4.5998E-02	4.7136E-02	
PB-212		4.3634E-01	4.3634E-01	9.4843E-02	9.8168E-02	
PB-214		3.8229E-01	3.8229E-01	7.7165E-02	8.0294E-02	
BI-212	#	3.8910E-01	3.8910E-01	3.2204E-01	3.2283E-01	
BI-214	#	4.0115E-01	4.0115E-01	8.1814E-02	8.5065E-02	4.862E-02
RA-224	#A	7.0350E-01	7.0350E-01	7.9890E-01	7.9994E-01	8.630E-01
RA-226	#	1.0280E+00	1.0280E+00	8.7172E-01	8.7376E-01	9.343E-01
AC-228		4.1133E-01	4.1133E-01	1.1164E-01	1.1416E-01	
TH-227	#B	-1.2895E-01	-1.2895E-01	2.9401E-01	2.9411E-01	3.244E-01
PA-234	#B	1.5534E-02	1.5534E-02	1.7048E-01	1.7048E-01	1.910E-01
TH-234	#B	6.3232E-01	6.3232E-01	4.9253E+00	4.9254E+00	5.531E+00
AM-241	#A	2.3179E-02	2.3179E-02	7.7332E-01	7.7333E-01	8.731E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (1460.6 to 2000.7 keV) 9.8997717E+00 pCi/gm
Total Decayed Activity (1460.6 to 2000.7 keV) 9.8997717E+00 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JJM

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 103F_22AUG2006_0918.An1

Sample description
FSS-OOL-05-04-072-F

Spectrum Filename: C:\GammaVision\Spectra\103F_22AUG2006_0918.An1

Acquisition information
Start time: 22-Aug-2006 09:18:33
Live time: 2000
Real time: 2002
Dead time: 0.08 %
Detector ID: 4

Detector system
Det 103 - DSPE-471

Calibration
Filename: D3_1LSa.Clb
Detector_103 1.0 Liter Sand Geometry

Energy Calibration
Created: 08-Aug-2005 11:09:41
Zero offset: 0.409 keV
Gain: 0.500 keV/channel
Quadratic: 1.092E-08 keV/channel^2

Efficiency Calibration
Created: 08-Aug-2005 11:11:25
Type: Polynomial
Uncertainty: 0.993 %
Coefficients: -0.264059 -5.138468 0.638383
-0.089199 0.005011 -0.000129

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.41keV)
Stop channel: 4000 (2000.67keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 1.4040E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.4040E+03) =
7.1225E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	19-Aug-2006 09:45:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	103_150K_05AUG05.Pbc 08-Aug-2005 12:54:15
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 15 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.2241

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
74.75	72.	30.47	0.99	9.111E-03	74.81	9.600	7.668E-01	PB212
77.35	145.	16.51	0.99	1.031E-02	77.11	17.500	7.710E-01	PB212
					77.11	10.700	1.261E+00	PB214
185.99	134.	22.52	1.57	2.567E-02				
185.99	134.	22.52	1.57	2.567E-02	185.99	3.280	1.379E+00	RA226
209.65	71.	36.95	1.01	2.470E-02				
238.78	729.	4.30	1.09	2.319E-02	238.63	43.100	6.906E-01	PB212
241.77	116.	17.19	1.09	2.303E-02	241.00	3.900	1.244E+00	RA224
					241.92	7.470	6.510E-01	PB214
270.19	87.	23.55	0.73	2.151E-02				
295.17	198.	13.98	1.16	2.025E-02	295.22	19.200	4.807E-01	PB214
328.30	70.	24.41	1.39	1.873E-02				
338.41	184.	13.33	1.05	1.830E-02	338.40	12.010	8.027E-01	AC228
352.00	367.	9.12	1.11	1.775E-02	351.99	37.100	5.281E-01	PB214
463.01	48.	32.07	1.50	1.425E-02	463.51	10.000	PBC<MDA	SB125
510.95	146.	13.22	1.92	1.317E-02	510.72	22.500	3.862E-01	TL208
583.27	250.	9.48	1.36	1.184E-02	583.14	86.000	2.323E-01	TL208
609.68	240.	8.22	1.33	1.143E-02	609.32	46.090	4.271E-01	BI214
661.76	292.	8.08	1.55	1.072E-02	661.62	84.620	3.089E-01	CS137
727.35	62.	34.77	0.73	9.963E-03	727.17	11.800	4.994E-01	BI212
795.09	37.	30.57	1.50	9.301E-03	795.76	85.400	4.438E-02	CS134
836.02	42.	29.74	0.96	8.960E-03	834.81	99.978	4.499E-02	MN54
860.76	39.	31.82	1.00	8.766E-03				
911.55	174.	9.37	1.62	8.398E-03	911.07	29.000	6.733E-01	AC228
969.03	156.	13.01	1.52	8.025E-03	968.90	17.460	1.067E+00	AC228
1120.50	64.	26.82	0.78	7.211E-03	1120.28	15.040	5.502E-01	BI214
1461.24	949.	3.50	1.76	5.931E-03	1460.75	10.700	1.410E+01	K40

1765.31	35.	18.13	1.00	5.142E-03	1764.51	15.920	4.130E-01	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide
418.46	209.65	290.	71.	0.035	110.84	1.006	NP-239
539.52	270.19	157.	87.	0.043	70.66	0.728	AC-228 s
655.74	328.30	107.	70.	0.035	73.22	1.389	RH-106M s
1720.57	860.76	40.	39.	0.020	95.46	0.997	TL-208

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-212	148.79	74.81	200.	71.	0.036	87.31	0.993D
PB-212	153.39	77.11	225.	98.	0.049	61.22	0.995A
RA-226	371.14	185.99	497.	100.	0.050	87.44	1.500D
PB-212	476.78	238.81	437.	707.	0.354	18.03	1.057
RA-224	482.80	241.82	427.	94.	0.047	98.59	1.500s
PB-214	482.61	241.73	190.	50.	0.025	115.16	1.291
PB-214	589.49	295.17	215.	194.	0.097	41.93	1.164
AC-228	675.96	338.41	163.	183.	0.092	40.00	1.052
PB-214	703.14	352.00	221.	361.	0.181	27.35	1.106
SB-125	925.15	463.01	101.	48.	0.024	96.22	1.500s
TL-208	1021.02	510.95	113.	119.	0.059	39.65	1.917s
TL-208	1165.65	583.27	105.	246.	0.123	28.44	1.361
BI-214	1218.46	609.68	64.	234.	0.117	24.65	1.330
CS-137	1322.60	661.76	82.	291.	0.146	24.23	1.547
BI-212	1453.77	727.35	102.	61.	0.031	104.32	0.728s
CS-134	1589.23	795.09	44.	37.	0.018	91.70	1.500s
MN-54	1671.09	836.02	38.	42.	0.021	89.21	0.964s
AC-228	1822.14	911.55	39.	170.	0.085	28.12	1.625
AC-228	1937.07	969.03	73.	155.	0.078	39.03	1.518
BI-214	2239.98	1120.50	64.	62.	0.031	80.45	0.776s
K-40	2921.34	1461.24	48.	930.	0.465	10.50	1.761
BI-214	3529.37	1765.31	7.	35.	0.018	54.40	0.997s

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	MDA Value pCi/gm	COMMENTS
BE-7		1.3285E-01					
			477.56	1.329E-01	%(	3.340E-01 1.00E-01	G
K-40		1.4101E+01					
			1460.75	1.410E+01	(P	5.313E-01 5.03E-01	G
MN-54		4.4989E-02					
			834.81	4.499E-02	(P	3.411E-02 1.35E-02	G
CO-57		-1.3769E-02					
			122.07	-1.377E-02	%(P	4.911E-02 1.47E-02	G K
			136.43	-3.435E-03	&	4.234E-01 1.26E-01	G
CO-60		-4.0172E-03					
			1332.51	-4.017E-03	%(P	5.137E-02 1.39E-02	G K
			1173.23	6.792E-03	& P	5.400E-02 1.54E-02	G K
Sr-85		-2.2490E-02					
			514.00	-2.249E-02	%(	5.140E-02 1.55E-02	G
Kr-85		-5.0246E+02					
			513.99	-5.025E+02	%(	1.149E+03 3.47E+02	G
Y-88		-4.4740E-05					
			1836.01	-4.474E-05	&(P	2.822E-02 6.91E-03	G K
			898.02	5.540E-03	& P	3.345E-02 9.45E-03	G
NB-94		3.3433E-04					
			871.10	3.343E-04	%(	3.406E-02 9.45E-03	G K
			702.50	7.895E-03	&	3.773E-02 1.10E-02	G K
Ag-108M		3.6217E-03					
			722.95	3.622E-03	&(	4.300E-02 1.23E-02	G K
			614.37	-1.686E-02	% P	4.387E-02 1.31E-02	G
			433.93	9.951E-03	%	3.625E-02 1.07E-02	G
CD-109		8.3737E-01					
			88.04	8.374E-01	%(	2.164E+00 6.54E-01	G
SN-113		-1.3618E-02					
			391.71	-1.362E-02	%(	5.973E-02 1.77E-02	G K
			255.04	-3.427E-01	&	1.755E+00 5.22E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	1.0608E-01						
		427.95	3.259E-02	%(P	1.094E-01	3.25E-02	G K
		600.77	5.738E-02	% P	1.705E-01	5.06E-02	G
		636.15	1.044E-01	% P	2.695E-01	8.04E-02	G
		463.51	3.236E-01	*(P	3.348E-01	1.07E-01	G
		176.29	8.453E-02	&	5.970E-01	1.78E-01	G
I-131	9.1749E-04						
		364.48	9.175E-04	%(P	5.427E-02	1.57E-02	G K
		636.97	1.940E-01	%	5.198E-01	1.55E-01	G
		284.29	2.171E-02	& P	6.412E-01	1.87E-01	G
CS-134	2.0759E-02						
		604.66	9.031E-05	%(	3.048E-02	8.55E-03	G K
		795.76	4.438E-02	(P	4.102E-02	1.36E-02	G
		569.29	6.176E-02	% P	2.365E-01	6.95E-02	G
		801.84	-8.134E-02	% P	5.027E-01	1.44E-01	G
CS-137	3.0888E-01						
		661.62	3.089E-01	(P	4.762E-02	2.51E-02	G
CE-139	1.5966E-02						
		165.85	1.597E-02	%(	4.158E-02	1.25E-02	G
EU-152	-9.8805E-04						
		121.78	-9.881E-04	%(P	1.352E-01	3.98E-02	G K
		344.30	-2.197E-02	& P	1.296E-01	3.82E-02	G
		1408.08	1.894E-02	%	1.670E-01	4.61E-02	G
		964.00	1.868E-01	% P	3.321E-01	1.02E-01	G
		1112.07	-2.874E-02	&	3.464E-01	9.85E-02	G
		778.90	-6.401E-02	%	2.897E-01	8.45E-02	G
EU-154	2.0783E-02						
		123.10	2.078E-02	&(	1.147E-01	3.43E-02	G K
		1274.80	-2.246E-02	%	1.380E-01	3.97E-02	G
		723.30	-2.608E-03	%	1.790E-01	5.04E-02	G
		1004.80	2.017E-02	%	1.946E-01	5.46E-02	G
EU-155	1.1097E-01						
		86.45	1.110E-01	%(	2.563E-01	7.76E-02	G K
		105.31	4.507E-02	%	2.263E-01	6.76E-02	G
HG-203	-6.4692E-04						
		279.17	-6.469E-04	&(P	4.546E-02	1.33E-02	G K
		72.87	-4.668E-01	% P	2.431E+00	7.28E-01	G
		70.83	1.069E-01	&	3.607E+00	1.06E+00	G
		82.50	-1.292E+00	%	4.278E+00	1.29E+00	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	2.3234E-01						
		583.14	2.323E-01	(P	4.770E-02	2.24E-02	G
		510.72	3.862E-01	+ P	1.697E-01	6.25E-02	G
PB-212	7.1856E-01						
		238.63	6.806E-01	(P	9.638E-02	4.16E-02	G K
							Energy duplication
		77.11	5.318E-01	} P	3.947E-01	1.09E-01	G
		74.81	7.896E-01	(P	7.604E-01	2.40E-01	G
PB-214	5.1191E-01						
		351.99	5.281E-01	(P	1.051E-01	4.89E-02	G K
		295.22	4.807E-01	(P	1.758E-01	6.86E-02	G
							Energy duplication
		77.11	3.100E-01	} P	9.582E-01	2.32E-01	G
		241.92	2.815E-01	-	3.744E-01	1.08E-01	G
BI-212	4.9937E-01						
		727.17	4.994E-01	(P	4.074E-01	1.75E-01	G K
		1620.56	1.369E-03	% P	1.222E+00	3.18E-01	G
		785.42	5.427E-01	%	1.772E+00	5.23E-01	G
BI-214	4.2346E-01						
		609.32	4.271E-01	(P	7.304E-02	3.61E-02	G K
		1764.51	4.130E-01	(P	1.755E-01	8.19E-02	G
		1120.28	5.502E-01	+ P	3.548E-01	1.52E-01	G
RA-224	1.0017E+00						
		241.00	1.002E+00	&(	1.059E+00	3.29E-01	G
RA-226	1.1415E+00						
							Energy duplication
		185.99	1.142E+00	*(P	1.219E+00	3.76E-01	G
AC-228	7.1120E-01						
		911.07	6.733E-01	(P	1.250E-01	6.44E-02	G K
		968.90	1.067E+00	+ P	2.914E-01	1.39E-01	G
		338.40	8.027E-01	(P	2.722E-01	1.08E-01	G
TH-227	1.1758E-02						
		236.00	1.176E-02	%(	4.796E-01	1.43E-01	G K
		256.25	3.162E-02	& P	4.581E-01	1.35E-01	G
PA-234	1.9135E-02						
		98.44	1.914E-02	%(P	2.321E-01	6.90E-02	G K
		946.00	-3.446E-02	& P	2.041E-01	5.88E-02	G
		131.28	3.090E-02	& P	2.169E-01	6.47E-02	G
		94.67	-1.369E-01	% P	4.622E-01	1.39E-01	G
		883.24	8.571E-02	%	2.641E-01	7.78E-02	G
		926.70	-5.017E-02	%	4.064E-01	1.17E-01	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26 9.136E-02 % P 3.499E-01 1.03E-01 G

TH-234      -5.5676E-01
                           63.29-5.568E-01 %(P 5.438E+00 1.59E+00 G K
                           92.80 1.025E+00 % P 2.381E+00 7.16E-01 G
                           92.38 1.210E+00 % P 2.834E+00 8.52E-01 G

AM-241       3.6640E-01
                           59.54 3.664E-01 %(P 1.185E+00 3.56E-01 G
   ( - This peak used in the nuclide activity average.

   * - Peak is too wide, but only one peak in library.
   ! - Peak is part of a multiplet and this area went
       negative during deconvolution.
   ? - Peak is too narrow.
   @ - Peak is too wide at FW25M, but ok at FWHM.
   % - Peak fails sensitivity test.
   $ - Peak identified, but first peak of this nuclide
       failed one or more qualification tests.
   + - Peak activity higher than counting uncertainty range.
   - - Peak activity lower than counting uncertainty range.
   = - Peak outside analysis energy range.
   & - Calculated peak centroid is not close enough to the
       library energy centroid for positive identification.
   P - Peakbackground subtraction
   } - Peak is too close to another for the activity
       to be found directly.

   Nuclide Codes:                      Peak Codes:
   T - Thermal Neutron Activation      G - Gamma Ray
   F - Fast Neutron Activation         X - X-Ray
   I - Fission Product                 P - Positron Decay
   N - Naturally Occurring Isotope     S - Single-Escape
   P - Photon Reaction                 D - Double-Escape
   C - Charged Particle Reaction       K - Key Line
   M - No MDA Calculation              A - Not in Average
   R - Coincidence Corrected           C - Coincidence Peak
   H - Halflife limit exceeded

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
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***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	1.2781E-01	1.3285E-01	3.0105E-01	3.0114E-01	3.213E-01
K-40		1.4101E+01	1.4101E+01	1.5098E+00	1.7175E+00	
MN-54		4.4692E-02	4.4989E-02	4.0481E-02	4.0565E-02	
CO-57	#B	-1.3664E-02	-1.3769E-02	4.5525E-02	4.5531E-02	4.873E-02
CO-60	#B	-4.0129E-03	-4.0172E-03	2.2091E-01	2.2091E-01	5.132E-02

Sr-85	#A	-2.1785E-02	-2.2490E-02	4.6597E-02	4.6616E-02	4.978E-02
Kr-85	#A	-5.0245E+02	-5.0246E+02	1.0420E+03	1.0424E+03	1.149E+03
Y-88	#B	-4.3881E-05	-4.4740E-05	4.3913E-02	4.3913E-02	2.768E-02
NB-94	#B	3.3433E-04	3.3433E-04	2.8337E-02	2.8337E-02	3.406E-02
Ag-108M	#B	3.6216E-03	3.6217E-03	3.6994E-02	3.6995E-02	4.299E-02
CD-109	#A	8.3356E-01	8.3737E-01	1.9611E+00	1.9617E+00	2.154E+00
SN-113	#B	-1.3376E-02	-1.3618E-02	5.3162E-02	5.3168E-02	5.867E-02
SB-125	#B	1.0586E-01	1.0608E-01	1.0480E-01	1.0498E-01	1.092E-01
I-131	#B	7.0952E-04	9.1749E-04	4.7248E-02	4.7248E-02	4.197E-02
CS-134	#B	2.0702E-02	2.0759E-02	1.9081E-02	1.9119E-02	3.040E-02
CS-137		3.0882E-01	3.0888E-01	7.5201E-02	7.7309E-02	
CE-139	#A	1.5727E-02	1.5966E-02	3.7607E-02	3.7618E-02	4.096E-02
EU-152	#B	-9.8761E-04	-9.8805E-04	7.8378E-01	7.8378E-01	1.352E-01
EU-154	#B	2.0769E-02	2.0783E-02	1.0285E-01	1.0285E-01	1.146E-01
EU-155	#B	1.1084E-01	1.1097E-01	2.3274E-01	2.3282E-01	2.560E-01
HG-203	#B	-6.1885E-04	-6.4692E-04	4.2879E-02	4.2879E-02	4.349E-02
TL-208		2.3234E-01	2.3234E-01	6.7240E-02	6.8580E-02	
PB-212		7.1856E-01	7.1856E-01	1.3172E-01	1.3817E-01	
PB-214		5.1191E-01	5.1191E-01	1.3061E-01	1.3395E-01	
BI-212		4.9937E-01	4.9937E-01	5.2517E-01	5.2597E-01	
BI-214		4.2346E-01	4.2346E-01	1.0727E-01	1.1005E-01	
RA-224	#A	1.0017E+00	1.0017E+00	9.8764E-01	9.8935E-01	1.059E+00
RA-226	#A	1.1415E+00	1.1415E+00	1.1277E+00	1.1296E+00	1.219E+00
AC-228		7.1120E-01	7.1120E-01	1.7570E-01	1.8049E-01	
TH-227	#B	1.1758E-02	1.1758E-02	4.2806E-01	4.2806E-01	4.796E-01
PA-234	#B	1.9135E-02	1.9135E-02	2.0691E-01	2.0691E-01	2.321E-01
TH-234	#B	-5.5676E-01	-5.5676E-01	1.8957E+01	1.8957E+01	5.438E+00
AM-241	#A	3.6640E-01	3.6640E-01	1.0679E+00	1.0681E+00	1.185E+00

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (87.4 to 2000.7 keV) 1.7551107E+01 pCi/gm
Total Decayed Activity (87.4 to 2000.7 keV) 1.7551462E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JPK

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 103F_22AUG2006_1000.An1

Sample description
FSS-OOL-05-04-077-F

Spectrum Filename: C:\GammaVision\Spectra\103F_22AUG2006_1000.An1

Acquisition information

Start time:	22-Aug-2006 10:00:01
Live time:	2000
Real time:	2001
Dead time:	0.07 %
Detector ID:	4

Detector system
Det 103 - DSPE-471

Calibration

Filename:	D3_1LSa.Clb

Detector_103 1.0 Liter Sand Geometry

Energy Calibration

Created:	08-Aug-2005 11:09:41
Zero offset:	0.409 keV
Gain:	0.500 keV/channel
Quadratic:	1.092E-08 keV/channel^2

Efficiency Calibration

Created:	08-Aug-2005 11:11:25
Type:	Polynomial
Uncertainty:	0.993 %
Coefficients:	-0.264059 -5.138468 0.638383
	-0.089199 0.005011 -0.000129

Library Files

Main analysis library:	FSS_Rev_1.Lib
Library Match Width:	1.000
Peak stripping:	Library based

Analysis parameters

Analysis engine:	Env32 G53W4.20
Start channel:	100 (50.41keV)
Stop channel:	4000 (2000.67keV)
Peak rejection level:	41.667%
Peak search sensitivity:	3
Sample Size:	1.2200E+03
Activity scaling factor:	1.0000E+06/(1.0000E+00* 1.2200E+03) = 8.1967E+02
Detection limit method:	Nureg 4.16
Random error:	1.0000000E+00
Systematic error:	1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	19-Aug-2006 07:50:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	103_150K_05AUG05.Pbc 08-Aug-2005 12:54:15
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 16 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.1874

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
74.86	101.	19.76	0.99	9.052E-03	72.87	6.400	PBC<MDA	HG203
					74.81	9.600	1.290E+00	PB212
77.16	76.	23.83	0.99	1.011E-02	77.11	17.500	6.250E-01	PB212
					77.11	10.700	1.022E+00	PB214
93.30	90.	37.53	1.67	1.662E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
186.45	112.	26.79	1.05	2.565E-02	185.99	3.280	1.308E+00	RA226
209.74	73.	36.02	1.37	2.469E-02				
238.80	555.	5.07	1.09	2.319E-02	238.63	43.100	6.016E-01	PB212
241.50	84.	27.87	1.09	2.305E-02	241.00	3.900	1.029E+00	RA224
					241.92	7.470	5.383E-01	PB214
295.42	133.	18.77	1.08	2.024E-02	295.22	19.200	3.677E-01	PB214
300.53	51.	37.52	1.15	1.999E-02				
328.04	50.	36.19	1.62	1.874E-02				
338.39	127.	18.19	0.93	1.830E-02	338.40	12.010	6.355E-01	AC228
351.87	242.	10.22	1.03	1.776E-02	351.99	37.100	3.968E-01	PB214
462.89	46.	36.73	1.32	1.426E-02				
462.89	46.	36.73	1.32	1.426E-02	463.51	10.000	PBC<MDA	SB125
511.14	131.	15.20	2.12	1.316E-02	510.72	22.500	3.914E-01	TL208
583.41	179.	11.19	1.36	1.184E-02	583.14	86.000	1.900E-01	TL208
609.36	196.	12.55	1.43	1.144E-02	609.32	46.090	3.973E-01	BI214
661.94	199.	9.99	1.02	1.072E-02	661.62	84.620	2.418E-01	CS137
727.72	65.	24.85	1.58	9.959E-03	727.17	11.800	6.095E-01	BI212
794.15	45.	30.01	1.44	9.316E-03				
794.15	45.	30.01	1.44	9.316E-03	795.76	85.400	6.267E-02	CS134
911.37	141.	10.66	1.71	8.399E-03	911.07	29.000	6.276E-01	AC228
967.83	134.	12.51	1.33	8.032E-03	968.90	17.460	1.062E+00	AC228

1120.86	27.	35.70	1.63	7.212E-03	1120.28	15.040	PBC<MDA	BI214
1173.73	105.	18.05	2.47	6.969E-03	1173.23	99.860	1.641E-01	CO60
1332.72	95.	12.90	1.09	6.349E-03	1332.51	99.980	1.620E-01	CO60
1461.28	719.	3.76	2.08	5.930E-03	1460.75	10.700	1.222E+01	K40

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
1765.38	19.	25.74	2.03	5.142E-03	1764.51	15.920	2.509E-01	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
418.63	209.74	256.	73.	0.036	108.06	1.366	NP-239	s
600.20	300.53	130.	51.	0.025	112.56	1.154	PB-212	s
655.22	328.04	118.	50.	0.025	108.56	1.624	AC-228	s
1217.81	609.36	240.	60.	0.030	115.77	1.428	BI-214	s
1587.35	794.15	44.	45.	0.022	90.04	1.442	PA-234	l

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-212	148.79	74.81	163.	101.	0.051	59.29	0.993D
PB-212	153.39	77.11	174.	76.	0.038	71.50	0.995A
RA-226	371.81	186.33	367.	78.	0.039	92.96	1.500s
PB-212	476.93	238.89	384.	524.	0.262	21.98	1.034
RA-224	482.39	241.62	361.	68.	0.034	124.48	1.500s
PB-214	589.99	295.42	186.	129.	0.065	56.31	1.079
AC-228	675.92	338.39	147.	126.	0.063	54.57	0.927
PB-214	702.89	351.87	137.	236.	0.118	30.66	1.033
SB-125	925.03	462.95	90.	41.	0.021	104.97	1.500
TL-208	1021.39	511.14	110.	105.	0.052	45.60	2.120s
TL-208	1165.92	583.41	78.	175.	0.087	33.56	1.357
BI-214	1218.06	609.48	62.	166.	0.083	29.33	1.500s
Ag-108M	1222.48	611.69	102.	-37.	-0.019	124.50	1.500s
CS-137	1322.96	661.94	63.	198.	0.099	29.96	1.018
BI-212	1453.91	727.42	32.	48.	0.024	65.18	1.500s
AC-228	1821.77	911.37	34.	138.	0.069	31.97	1.708s
AC-228	1934.68	967.83	43.	134.	0.067	37.54	1.330s
BI-214	2240.69	1120.86	40.	27.	0.013	107.11	1.634s
CO-60	2346.43	1173.73	64.	103.	0.052	54.15	2.468s
CO-60	2664.34	1332.72	18.	93.	0.046	38.71	1.095s
K-40	2921.43	1461.28	22.	700.	0.350	11.27	2.084
BI-214	3529.51	1765.38	8.	19.	0.009	77.23	2.033

s - Peak fails shape tests.
D - Peak area deconvoluted.

A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	MDA Value pCi/gm	COMMENTS
BE-7		1.6680E-01					
			477.56	1.668E-01	%(	3.866E-01 1.17E-01	G
K-40		1.2224E+01					
			1460.75	1.222E+01	(P	4.245E-01 4.72E-01	G
MN-54		6.5737E-03					
			834.81	6.574E-03	%(P	4.526E-02 1.30E-02	G
CO-57		1.3327E-03					
			122.07	1.333E-03	%(P	5.714E-02 1.69E-02	G K
			136.43	-1.860E-02	%	4.125E-01 1.22E-01	G
CO-60		1.6308E-01					
			1332.51	1.620E-01	(P	3.951E-02 2.15E-02	G K
			1173.23	1.641E-01	(P	6.367E-02 3.02E-02	G K
Sr-85		-8.1816E-03					
			514.00	-8.182E-03	%(	5.350E-02 1.57E-02	G
Kr-85		-1.8335E+02					
			513.99	-1.834E+02	%(	1.195E+03 3.52E+02	G
Y-88		3.9972E-03					
			1836.01	3.997E-03	%(P	2.347E-02 6.03E-03	G K
			898.02	5.686E-03	% P	3.476E-02 9.74E-03	G
NB-94		-1.7839E-03					
			871.10	-1.784E-03	&(	3.362E-02 9.28E-03	G K
			702.50	0.000E+00	%	4.455E-02 1.26E-02	G K
Ag-108M		-1.7248E-02					
			722.95	-1.725E-02	%(	5.483E-02 1.63E-02	G K
			614.37	-4.040E-02	+ P	5.357E-02 1.67E-02	G
			433.93	0.000E+00	%	4.281E-02 1.23E-02	G
CD-109		-6.3696E-02					
			88.04	-6.370E-02	&(	2.293E+00 6.81E-01	G
SN-113		7.3373E-03					
			391.71	7.337E-03	%(	5.439E-02 1.59E-02	G K
			255.04	-2.686E-01	%	1.833E+00 5.42E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	6.3545E-02						
		427.95	-2.329E-02	%(P	1.213E-01	3.56E-02	G K
		600.77	-6.603E-02	% P	2.288E-01	6.77E-02	G
		636.15	9.514E-03	% P	3.390E-01	9.57E-02	G
		463.51	3.206E-01	(P	3.660E-01	1.16E-01	G
		176.29	-1.396E-01	%	6.241E-01	1.86E-01	G
I-131	1.6921E-02						
		364.48	1.692E-02	&(P	4.685E-02	1.40E-02	G K
		636.97	-1.215E-01	&	6.591E-01	1.91E-01	G
		284.29	5.104E-02	& P	7.054E-01	2.06E-01	G
CS-134	0.0000E+00						
		604.66	0.000E+00	%(	8.097E-02	2.38E-02	G K
		795.76	3.017E-02	% P	4.233E-02	1.34E-02	G
		569.29	2.890E-02	& P	2.271E-01	6.49E-02	G
		801.84	-2.944E-02	% P	3.336E-01	8.70E-02	G
CS-137	2.4178E-01						
		661.62	2.418E-01	(P	4.847E-02	2.43E-02	G
CE-139	1.5178E-03						
		165.85	1.518E-03	%(	4.441E-02	1.31E-02	G
EU-152	2.9586E-03						
		121.78	2.959E-03	%(P	1.664E-01	4.92E-02	G K
		344.30	-4.139E-05	& P	1.183E-01	3.40E-02	G
		1408.08	6.626E-02	&	1.738E-01	5.15E-02	G
		964.00	3.112E-02	% P	4.024E-01	1.15E-01	G
		1112.07	-7.589E-03	%	3.415E-01	9.48E-02	G
		778.90	0.000E+00	%	3.877E-01	1.10E-01	G
EU-154	-4.4150E-03						
		123.10	-4.415E-03	%(	1.186E-01	3.51E-02	G K
		1274.80	0.000E+00	%	1.342E-01	3.68E-02	G
		723.30	-8.291E-02	%	2.558E-01	7.61E-02	G
		1004.80	2.330E-02	&	2.291E-01	6.44E-02	G
EU-155	-1.2781E-02						
		86.45	-1.278E-02	%(	2.725E-01	8.09E-02	G K
		105.31	4.704E-02	%	2.477E-01	7.39E-02	G
HG-203	1.1356E-02						
		279.17	1.136E-02	%(P	3.916E-02	1.17E-02	G K
		72.87	2.889E-01	& P	2.464E+00	7.34E-01	G
		70.83	6.676E-01	&	3.668E+00	1.09E+00	G
		82.50	7.061E-01	%	4.025E+00	1.20E+00	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments

TL-208       1.8996E-01
                          583.14 1.900E-01  (P 4.779E-02 2.18E-02 G
                          510.72 3.914E-01 + P 1.930E-01 7.47E-02 G

PB-212       5.9312E-01
                          238.63 5.802E-01  (P 1.042E-01 4.35E-02 G K
                                                          Energy duplication
                           77.11 4.768E-01 } P 4.018E-01 1.14E-01 G
                           74.81 1.290E+00 + P 7.937E-01 2.63E-01 G

PB-214       3.8689E-01
                          351.99 3.968E-01  (P 9.630E-02 4.15E-02 G K
                          295.22 3.677E-01  (P 1.888E-01 7.12E-02 G
                                                          Energy duplication
                           77.11 4.219E-02 } P 8.906E-01 2.62E-01 G
                          241.92 3.508E-01 %   5.873E-01 1.79E-01 G

BI-212       4.5236E-01
                          727.17 4.524E-01  (P 2.730E-01 9.93E-02 G K
                         1620.56 4.276E-01 % P 1.150E+00 3.38E-01 G
                          785.42 4.687E-01 %   2.074E+00 6.04E-01 G

BI-214       3.4867E-01
                          609.32 3.487E-01  (P 8.301E-02 3.54E-02 G K
                         1764.51 2.509E-01 - P 2.165E-01 7.60E-02 G
                         1120.28 2.749E-01 - P 3.302E-01 1.05E-01 G

RA-224       8.3415E-01
                          241.00 8.342E-01 ?(  1.124E+00 3.46E-01 G

RA-226       1.0307E+00
                          185.99 1.031E+00 *(P 1.211E+00 3.72E-01 G

AC-228       6.2988E-01
                          911.07 6.276E-01 @(P 1.358E-01 6.85E-02 G K
                          968.90 1.062E+00 + P 2.620E-01 1.33E-01 G
                          338.40 6.355E-01  (P 2.983E-01 1.17E-01 G

TH-227      -4.4003E-02
                          236.00-4.400E-02 %(  3.750E-01 1.11E-01 G K
                          256.25-5.001E-02 & P 5.231E-01 1.54E-01 G

PA-234       1.1386E-03
                           98.44 1.139E-03 &(P 2.331E-01 6.87E-02 G K
                          946.00-2.506E-02 & P 2.513E-01 7.19E-02 G
                          131.28-1.366E-03 & P 2.144E-01 6.32E-02 G
                           94.67 3.944E-03 & P 4.191E-01 1.24E-01 G
                          883.24 6.357E-02 %   3.287E-01 9.46E-02 G
                          926.70-7.180E-02 %   3.935E-01 1.13E-01 G
```

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 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26 3.387E-02 & P 3.418E-01 9.73E-02 G

TH-234       1.4500E+00
                           63.29 1.450E+00 %(P 6.819E+00 2.03E+00 G K
                           92.80 1.605E+00 % P 2.331E+00 7.08E-01 G
                           92.38 1.826E+00 % P 2.784E+00 8.45E-01 G

AM-241      -3.8145E-01
                           59.54-3.815E-01 %(P 1.263E+00 3.79E-01 G
   ( - This peak used in the nuclide activity average.

   * - Peak is too wide, but only one peak in library.
   ! - Peak is part of a multiplet and this area went
       negative during deconvolution.
   ? - Peak is too narrow.
   @ - Peak is too wide at FW25M, but ok at FWHM.
   % - Peak fails sensitivity test.
   $ - Peak identified, but first peak of this nuclide
       failed one or more qualification tests.
   + - Peak activity higher than counting uncertainty range.
   - - Peak activity lower than counting uncertainty range.
   = - Peak outside analysis energy range.
   & - Calculated peak centroid is not close enough to the
       library energy centroid for positive identification.
   P - Peakbackground subtraction
   } - Peak is too close to another for the activity
       to be found directly.

   Nuclide Codes:                      Peak Codes:
   T - Thermal Neutron Activation      G - Gamma Ray
   F - Fast Neutron Activation         X - X-Ray
   I - Fission Product                 P - Positron Decay
   N - Naturally Occurring Isotope     S - Single-Escape
   P - Photon Reaction                 D - Double-Escape
   C - Charged Particle Reaction       K - Key Line
   M - No MDA Calculation              A - Not in Average
   R - Coincidence Corrected           C - Coincidence Peak
   H - Halflife limit exceeded

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
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***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	1.6024E-01	1.6680E-01	3.4987E-01	3.5000E-01	3.714E-01
K-40		1.2224E+01	1.2224E+01	1.4144E+00	1.5824E+00	
MN-54	#A	6.5288E-03	6.5737E-03	3.9024E-02	3.9026E-02	4.495E-02
CO-57	#B	1.3221E-03	1.3327E-03	5.0702E-02	5.0702E-02	5.668E-02
CO-60		1.6290E-01	1.6308E-01	5.5482E-02	5.6284E-02	

Sr-85	#A	-7.9157E-03	-8.1816E-03	4.7230E-02	4.7232E-02	5.176E-02
Kr-85	#A	-1.8335E+02	-1.8335E+02	1.0549E+03	1.0550E+03	1.195E+03
Y-88	#B	3.9177E-03	3.9972E-03	1.8077E-02	1.8079E-02	2.300E-02
NB-94	#B	-1.7839E-03	-1.7839E-03	2.7836E-02	2.7836E-02	3.362E-02
Ag-108M	#B	-1.7247E-02	-1.7248E-02	4.8880E-02	4.8890E-02	5.482E-02
CD-109	#A	-6.3396E-02	-6.3696E-02	2.0415E+00	2.0415E+00	2.283E+00
SN-113	#B	7.2020E-03	7.3373E-03	4.7610E-02	4.7612E-02	5.338E-02
SB-125	#B	6.3411E-02	6.3545E-02	6.8773E-02	6.8872E-02	1.210E-01
I-131	#B	1.2963E-02	1.6921E-02	4.1945E-02	4.1957E-02	3.589E-02
CS-134	#B	0.0000E+00	0.0000E+00	7.1281E-02	7.1281E-02	8.074E-02
CS-137		2.4174E-01	2.4178E-01	7.2944E-02	7.4282E-02	
CE-139	#A	1.4943E-03	1.5178E-03	3.9195E-02	3.9195E-02	4.372E-02
EU-152	#B	2.9572E-03	2.9586E-03	1.4760E-01	1.4760E-01	1.663E-01
EU-154	#B	-4.4119E-03	-4.4150E-03	1.0533E-01	1.0533E-01	1.185E-01
EU-155	#B	-1.2766E-02	-1.2781E-02	2.4278E-01	2.4278E-01	2.722E-01
HG-203	#B	1.0845E-02	1.1356E-02	3.4986E-02	3.4992E-02	3.740E-02
TL-208		1.8996E-01	1.8996E-01	6.5325E-02	6.6249E-02	
PB-212		5.9312E-01	5.9312E-01	1.3337E-01	1.3774E-01	
PB-214		3.8689E-01	3.8689E-01	1.2144E-01	1.2350E-01	
BI-212	#	4.5236E-01	4.5236E-01	2.9788E-01	2.9904E-01	2.730E-01
BI-214	#	3.4867E-01	3.4867E-01	1.0626E-01	1.0817E-01	8.301E-02
RA-224	#A	8.3415E-01	8.3415E-01	1.0383E+00	1.0395E+00	1.124E+00
RA-226	#A	1.0307E+00	1.0307E+00	1.1166E+00	1.1182E+00	1.211E+00
AC-228		6.2988E-01	6.2988E-01	2.0173E-01	2.0502E-01	
TH-227	#B	-4.4003E-02	-4.4003E-02	3.3346E-01	3.3347E-01	3.750E-01
PA-234	#B	1.1386E-03	1.1386E-03	2.0616E-01	2.0616E-01	2.331E-01
TH-234	#B	1.4500E+00	1.4500E+00	6.0806E+00	6.0811E+00	6.819E+00
AM-241	#A	-3.8145E-01	-3.8145E-01	1.1527E+00	1.1528E+00	1.263E+00

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (86.9 to 2000.7 keV) 1.4428641E+01 pCi/gm
Total Decayed Activity (86.9 to 2000.7 keV) 1.4428870E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JPK

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: FSS-OOL-05-04-084-F.An1

Sample description
FSS-OOL-05-04-084-F

Spectrum Filename: C:\GammaVision\Spectra\FSS-OOL-05-04-084-F.An1

Acquisition information

Start time:	22-Aug-2006 10:43:37
Live time:	2000
Real time:	2001
Dead time:	0.07 %
Detector ID:	4

Detector system
Det 103 - DSPE-471

Calibration

Filename:	D3_1LSa.Clb

Detector_103 1.0 Liter Sand Geometry

Energy Calibration

Created:	08-Aug-2005 11:09:41
Zero offset:	0.409 keV
Gain:	0.500 keV/channel
Quadratic:	1.092E-08 keV/channel^2

Efficiency Calibration

Created:	08-Aug-2005 11:11:25
Type:	Polynomial
Uncertainty:	0.993 %
Coefficients:	-0.264059 -5.138468 0.638383
	-0.089199 0.005011 -0.000129

Library Files

Main analysis library:	FSS_Rev_1.Lib
Library Match Width:	1.000
Peak stripping:	Library based

Analysis parameters

Analysis engine:	Env32 G53W4.20
Start channel:	100 (50.41keV)
Stop channel:	4000 (2000.67keV)
Peak rejection level:	41.667%
Peak search sensitivity:	3
Sample Size:	1.9510E+03
Activity scaling factor:	1.0000E+06/(1.0000E+00* 1.9510E+03) = 5.1256E+02
Detection limit method:	Nureg 4.16
Random error:	1.0000000E+00
Systematic error:	1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	19-Aug-2006 07:25:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	103_150K_05AUG05.Pbc 08-Aug-2005 12:54:15
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 13 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.1615

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
74.58	68.	32.42	0.99	8.997E-03	74.81	9.600	PBC<MDA	PB212
77.30	126.	17.14	0.99	1.025E-02	77.11	17.500	4.806E-01	PB212
186.56	116.	24.32	1.04	2.565E-02	185.99	3.280	8.470E-01	RA226
238.78	612.	4.76	1.09	2.319E-02	238.63	43.100	4.159E-01	PB212
241.79	100.	20.85	1.09	2.303E-02	241.00	3.900	7.660E-01	RA224
					241.92	7.470	4.008E-01	PB214
270.64	67.	37.45	0.83	2.149E-02				
295.25	152.	15.06	1.22	2.025E-02	295.22	19.200	2.632E-01	PB214
300.32	49.	41.60	1.17	2.000E-02				
338.52	125.	14.82	0.91	1.830E-02	338.40	12.010	3.892E-01	AC228
352.03	303.	9.96	1.16	1.775E-02	351.99	37.100	3.127E-01	PB214
463.27	46.	29.33	1.34	1.425E-02				
463.27	46.	29.33	1.34	1.425E-02	463.51	10.000	2.169E-01	SB125
510.97	149.	16.57	1.90	1.317E-02	510.72	22.500	2.849E-01	TL208
583.37	210.	9.95	1.41	1.184E-02	583.14	86.000	1.399E-01	TL208
609.49	241.	9.38	1.42	1.144E-02	609.32	46.090	3.078E-01	BI214
727.52	54.	23.44	1.39	9.961E-03	727.17	11.800	3.181E-01	BI212
911.46	150.	10.82	1.49	8.399E-03	911.07	29.000	4.183E-01	AC228
964.93	39.	26.72	1.54	8.051E-03	964.00	14.580	PBC<MDA	EU152
969.25	94.	13.04	1.54	8.024E-03	968.90	17.460	4.659E-01	AC228
1121.04	45.	25.32	0.77	7.212E-03	1120.28	15.040	2.893E-01	BI214
1461.33	931.	3.31	1.83	5.930E-03	1460.75	10.700	9.952E+00	K40
1765.29	34.	18.25	2.06	5.142E-03	1764.51	15.920	2.837E-01	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
540.42	270.64	225.	67.	0.034	112.34	0.831	AC-228	s
599.79	300.32	157.	49.	0.024	124.81	1.167	PB-212	s
1929.40	964.88	31.	42.	0.021	73.50	1.538	AC-228	D

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-212	148.79	74.81	202.	73.	0.037	85.38	0.993D
PB-212	153.39	77.11	212.	95.	0.048	60.12	0.995A
RA-226	371.98	186.41	430.	100.	0.050	81.44	1.500s
PB-212	476.74	238.79	471.	537.	0.269	23.11	1.014
RA-224	482.78	241.81	476.	87.	0.044	111.10	1.500
PB-214	589.66	295.25	165.	148.	0.074	45.18	1.216
AC-228	676.18	338.52	99.	124.	0.062	44.47	0.906
PB-214	703.20	352.03	190.	297.	0.149	29.87	1.164
SB-125	925.51	463.20	80.	47.	0.023	89.38	1.500s
TL-208	1021.06	510.97	147.	122.	0.061	49.70	1.899s
TL-208	1165.84	583.37	85.	206.	0.103	29.86	1.410
BI-214	1218.07	609.49	86.	234.	0.117	28.14	1.424s
BI-212	1454.12	727.52	44.	54.	0.027	70.33	1.390s
AC-228	1821.94	911.46	46.	147.	0.074	32.46	1.492
AC-228	1936.81	968.90	28.	94.	0.047	38.79	1.541D
BI-214	2241.06	1121.04	39.	45.	0.023	75.97	0.771s
K-40	2921.53	1461.33	25.	912.	0.456	9.94	1.832
BI-214	3529.33	1765.29	6.	34.	0.017	54.76	2.063

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	MDA Value pCi/gm	COMMENTS
BE-7		6.5664E-02					
			477.56	6.566E-02	%(	2.125E-01 6.30E-02	G
K-40		9.9520E+00					
			1460.75	9.952E+00	(P	2.839E-01 3.36E-01	G
MN-54		1.1484E-02					
			834.81	1.148E-02	&(P	2.508E-02 7.57E-03	G
CO-57		5.8543E-03					
			122.07	5.854E-03	&(P	3.818E-02 1.14E-02	G K
			136.43	-2.796E-03	&	3.324E-01 9.88E-02	G
CO-60		-1.9923E-03					
			1332.51	-1.992E-03	&(P	3.023E-02 7.95E-03	G K
			1173.23	-1.000E-02	% P	3.712E-02 1.06E-02	G K
Sr-85		-7.6987E-03					
			514.00	-7.699E-03	%(	3.267E-02 9.68E-03	G
Kr-85		-1.7161E+02					
			513.99	-1.716E+02	%(	7.293E+02 2.16E+02	G
Y-88		3.5057E-03					
			1836.01	3.506E-03	%(P	1.052E-02 2.79E-03	G K
			898.02	3.008E-03	% P	2.868E-02 8.11E-03	G
NB-94		0.0000E+00					
			871.10	0.000E+00	%(	2.946E-02 8.29E-03	G K
			702.50	3.410E-03	%	2.422E-02 6.96E-03	G K
Ag-108M		1.3546E-02					
			722.95	1.355E-02	&(	2.460E-02 7.56E-03	G K
			614.37	-1.593E-02	% P	3.339E-02 1.01E-02	G
			433.93	1.009E-03	%	2.502E-02 7.21E-03	G
CD-109		5.9253E-01					
			88.04	5.925E-01	&(	1.440E+00 4.35E-01	G
SN-113		9.4807E-03					
			391.71	9.481E-03	&(	2.966E-02 8.82E-03	G K
			255.04	-1.913E-01	&	1.197E+00 3.55E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	5.3259E-02						
		427.95	-5.672E-03	%(P	7.010E-02	2.02E-02	G K
		600.77	5.462E-02	% P	1.059E-01	3.23E-02	G
		636.15	-3.066E-02	& P	1.952E-01	5.57E-02	G
		463.51	2.277E-01	(P	2.157E-01	6.97E-02	G
		176.29	3.057E-03	%	3.924E-01	1.16E-01	G
I-131	5.9467E-03						
		364.48	5.947E-03	&(P	3.464E-02	1.02E-02	G K
		636.97	1.081E-01	&	3.996E-01	1.17E-01	G
		284.29	8.708E-02	% P	5.172E-01	1.53E-01	G
CS-134	-1.1972E-02						
		604.66	-1.197E-02	%(	3.136E-02	9.41E-03	G K
		795.76	2.042E-02	% P	2.992E-02	9.36E-03	G
		569.29	2.209E-02	% P	1.530E-01	4.40E-02	G
		801.84	-4.921E-03	% P	3.292E-01	9.19E-02	G
CS-137	1.7107E-02						
		661.62	1.711E-02	%(P	2.710E-02	8.36E-03	G
CE-139	-4.3534E-03						
		165.85	-4.353E-03	%(	3.696E-02	1.10E-02	G
EU-152	1.6703E-02						
		121.78	1.670E-02	&(P	1.112E-01	3.31E-02	G K
		344.30	2.059E-02	% P	8.141E-02	2.41E-02	G
		1408.08	2.820E-02	%	1.218E-01	3.48E-02	G
		964.00	1.645E-01	% P	2.376E-01	7.40E-02	G
		1112.07	-1.954E-02	%	2.493E-01	7.08E-02	G
		778.90	-6.029E-05	%	2.040E-01	5.73E-02	G
EU-154	-1.3650E-02						
		123.10	-1.365E-02	%(	8.383E-02	2.50E-02	G K
		1274.80	-1.058E-03	&	9.391E-02	2.61E-02	G
		723.30	7.486E-03	&	2.452E-01	7.17E-02	G
		1004.80	1.249E-02	%	1.716E-01	4.86E-02	G
EU-155	7.1323E-02						
		86.45	7.132E-02	%(	1.811E-01	5.47E-02	G K
		105.31	4.336E-02	%	1.772E-01	5.31E-02	G
HG-203	-1.0115E-03						
		279.17	-1.011E-03	&(P	3.357E-02	9.86E-03	G K
		72.87	-6.220E-01	% P	1.675E+00	5.05E-01	G
		70.83	1.224E-01	&	3.468E+00	1.03E+00	G
		82.50	-3.369E-01	%	3.127E+00	9.32E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	1.3986E-01						
		583.14	1.399E-01	(P	3.111E-02	1.42E-02	G
		510.72	2.849E-01	+ P	1.384E-01	5.76E-02	G
PB-212	3.7202E-01						
		238.63	3.720E-01	(P	7.193E-02	2.93E-02	G K
							Energy duplication
		77.11	3.720E-01	} P	2.764E-01	7.45E-02	G
		74.81	5.848E-01	+ P	5.490E-01	1.73E-01	G
PB-214	2.9584E-01						
		351.99	3.127E-01	(P	7.034E-02	3.17E-02	G K
		295.22	2.632E-01	(P	1.116E-01	4.07E-02	G
							Energy duplication
		77.11	7.618E-03	} P	6.242E-01	1.40E-01	G
		241.92	2.090E-01	%	4.481E-01	1.36E-01	G
BI-212	3.1813E-01						
		727.17	3.181E-01	@(P	1.980E-01	7.53E-02	G K
		1620.56	2.503E-01	& P	4.814E-01	1.52E-01	G
		785.42	-3.924E-02	%	1.537E+00	4.38E-01	G
BI-214	2.9924E-01						
		609.32	3.078E-01	@(P	6.022E-02	2.97E-02	G K
		1764.51	2.837E-01	(P	1.232E-01	5.69E-02	G
		1120.28	2.893E-01	*(P	2.024E-01	7.64E-02	G
RA-224	6.6978E-01						
		241.00	6.698E-01	(	8.032E-01	2.48E-01	G
RA-226	8.2667E-01						
		185.99	8.267E-01	*(P	8.177E-01	2.53E-01	G
AC-228	4.2674E-01						
		911.07	4.183E-01	(P	9.743E-02	4.63E-02	G K
		968.90	4.666E-01	(P	1.344E-01	6.04E-02	G
		338.40	3.892E-01	(P	1.550E-01	5.82E-02	G
TH-227	-8.3529E-02						
		236.00	-8.353E-02	%(	2.868E-01	8.61E-02	G K
		256.25	3.177E-02	& P	2.945E-01	8.65E-02	G
PA-234	-4.5996E-03						
		98.44	-4.600E-03	&(P	1.567E-01	4.63E-02	G K
		946.00	6.362E-02	% P	1.106E-01	3.43E-02	G
		131.28	7.906E-03	% P	1.713E-01	5.09E-02	G
		94.67	-1.344E-02	% P	2.941E-01	8.73E-02	G
		883.24	-3.162E-02	&	1.848E-01	5.26E-02	G
		926.70	-1.316E-03	%	2.510E-01	7.00E-02	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26 3.268E-02 % P 2.263E-01 6.51E-02 G

TH-234       1.5877E-01
                           63.29 1.588E-01 &(P 4.922E+00 1.45E+00 G K
                                                          Energy duplication
                           92.80 8.247E-01 % P 1.647E+00 4.96E-01 G
                           92.38 9.133E-01 % P 2.017E+00 6.07E-01 G

AM-241       1.7785E-01
                           59.54 1.778E-01 &(P 8.558E-01 2.56E-01 G
   ( - This peak used in the nuclide activity average.

   * - Peak is too wide, but only one peak in library.
   ! - Peak is part of a multiplet and this area went
       negative during deconvolution.
   ? - Peak is too narrow.
   @ - Peak is too wide at FW25M, but ok at FWHM.
   % - Peak fails sensitivity test.
   $ - Peak identified, but first peak of this nuclide
       failed one or more qualification tests.
   + - Peak activity higher than counting uncertainty range.
   - - Peak activity lower than counting uncertainty range.
   = - Peak outside analysis energy range.
   & - Calculated peak centroid is not close enough to the
       library energy centroid for positive identification.
   P - Peakbackground subtraction
   } - Peak is too close to another for the activity
       to be found directly.

   Nuclide Codes:                      Peak Codes:
   T - Thermal Neutron Activation      G - Gamma Ray
   F - Fast Neutron Activation         X - X-Ray
   I - Fission Product                 P - Positron Decay
   N - Naturally Occurring Isotope     S - Single-Escape
   P - Photon Reaction                 D - Double-Escape
   C - Charged Particle Reaction       K - Key Line
   M - No MDA Calculation              A - Not in Average
   R - Coincidence Corrected           C - Coincidence Peak
   H - Halflife limit exceeded

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
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***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	6.3043E-02	6.5664E-02	1.8906E-01	1.8910E-01	2.040E-01
K-40		9.9520E+00	9.9520E+00	1.0092E+00	1.1629E+00	
MN-54	#A	1.1404E-02	1.1484E-02	2.2717E-02	2.2727E-02	2.491E-02
CO-57	#B	5.8074E-03	5.8543E-03	3.4168E-02	3.4169E-02	3.788E-02

CO-60	#B	-1.9900E-03	-1.9923E-03	1.2953E-01	1.2953E-01	3.020E-02

Sr-85	#A	-7.4447E-03	-7.6987E-03	2.9049E-02	2.9053E-02	3.159E-02
Kr-85	#A	-1.7161E+02	-1.7161E+02	6.4846E+02	6.4854E+02	7.293E+02
Y-88	#B	3.4349E-03	3.5057E-03	8.3742E-03	8.3767E-03	1.031E-02
NB-94	#B	0.0000E+00	0.0000E+00	2.4856E-02	2.4856E-02	2.946E-02
Ag-108M	#B	1.3545E-02	1.3546E-02	2.2667E-02	2.2681E-02	2.460E-02
CD-109	#A	5.8970E-01	5.9253E-01	1.3062E+00	1.3066E+00	1.433E+00
SN-113	#B	9.3032E-03	9.4807E-03	2.6453E-02	2.6458E-02	2.911E-02
SB-125	#B	5.3145E-02	5.3259E-02	4.8902E-02	4.8999E-02	6.995E-02
I-131	#B	4.5372E-03	5.9467E-03	3.0469E-02	3.0471E-02	2.643E-02
CS-134	#B	-1.1938E-02	-1.1972E-02	2.8231E-02	2.8240E-02	3.127E-02
CS-137	#A	1.7104E-02	1.7107E-02	2.5088E-02	2.5108E-02	2.709E-02
CE-139	#A	-4.2850E-03	-4.3534E-03	3.3016E-02	3.3017E-02	3.638E-02
EU-152	#B	1.6695E-02	1.6703E-02	9.9442E-02	9.9447E-02	1.111E-01
EU-154	#B	-1.3640E-02	-1.3650E-02	7.5128E-02	7.5132E-02	8.377E-02
EU-155	#B	7.1238E-02	7.1323E-02	1.6418E-01	1.6422E-01	1.809E-01
HG-203	#B	-9.6535E-04	-1.0115E-03	3.0555E-02	3.0556E-02	3.204E-02
TL-208		1.3986E-01	1.3986E-01	4.2633E-02	4.3400E-02	
PB-212		3.7202E-01	3.7202E-01	8.7884E-02	9.0500E-02	
PB-214		2.9584E-01	2.9584E-01	8.2105E-02	8.3882E-02	
BI-212	#	3.1813E-01	3.1813E-01	2.2579E-01	2.2655E-01	
BI-214		2.9924E-01	2.9924E-01	8.6524E-02	8.8251E-02	
RA-224	#A	6.6978E-01	6.6978E-01	7.4413E-01	7.4515E-01	8.032E-01
RA-226	#	8.2667E-01	8.2667E-01	7.6009E-01	7.6160E-01	8.177E-01
AC-228		4.2674E-01	4.2674E-01	9.6736E-02	9.9858E-02	
TH-227	#B	-8.3529E-02	-8.3529E-02	2.5844E-01	2.5849E-01	2.868E-01
PA-234	#B	-4.5996E-03	-4.5996E-03	2.7288E-01	2.7288E-01	1.567E-01
TH-234	#B	1.5877E-01	1.5877E-01	4.3591E+00	4.3591E+00	4.922E+00
AM-241	#A	1.7784E-01	1.7785E-01	7.6707E-01	7.6713E-01	8.558E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (1120.0 to 2000.7 keV) 1.1803847E+01 pCi/gm
Total Decayed Activity (1120.0 to 2000.7 keV) 1.1803847E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JPK

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 103F_22AUG2006_1148.An1

Sample description
FSS-OOL-05-04-076-F

Spectrum Filename: C:\GammaVision\Spectra\103F_22AUG2006_1148.An1

Acquisition information
Start time: 22-Aug-2006 11:48:38
Live time: 2000
Real time: 2001
Dead time: 0.07 %
Detector ID: 4

Detector system
Det 103 - DSPE-471

Calibration
Filename: D3_1LSa.Clb
Detector_103 1.0 Liter Sand Geometry

Energy Calibration
Created: 08-Aug-2005 11:09:41
Zero offset: 0.409 keV
Gain: 0.500 keV/channel
Quadratic: 1.092E-08 keV/channel^2

Efficiency Calibration
Created: 08-Aug-2005 11:11:25
Type: Polynomial
Uncertainty: 0.993 %
Coefficients: -0.264059 -5.138468 0.638383
-0.089199 0.005011 -0.000129

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.41keV)
Stop channel: 4000 (2000.67keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 1.6240E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.6240E+03) =
6.1576E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	19-Aug-2006 11:00:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	103_150K_05AUG05.Pbc 08-Aug-2005 12:54:15
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 10 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.1917

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
74.90	60.	29.80	0.99	9.052E-03	74.81	9.600	5.756E-01	PB212
77.20	51.	31.22	0.99	1.011E-02	77.11	17.500	3.764E-01	PB212
					77.11	10.700	PBC<MDA	PB214
118.70	55.	36.93	0.62	2.294E-02				
186.13	84.	28.23	1.43	2.566E-02	185.99	3.280	PBC<MDA	RA226
238.87	364.	6.63	1.09	2.319E-02	238.63	43.100	2.931E-01	PB212
241.45	79.	28.16	1.09	2.305E-02	241.00	3.900	7.306E-01	RA224
					241.92	7.470	3.823E-01	PB214
295.06	139.	16.64	1.33	2.026E-02	295.22	19.200	2.884E-01	PB214
338.15	77.	30.48	1.04	1.831E-02				
338.15	77.	30.48	1.04	1.831E-02	338.40	12.010	2.874E-01	AC228
351.97	219.	9.40	0.99	1.775E-02	351.99	37.100	2.701E-01	PB214
511.06	23.	29.34	1.50	1.317E-02	510.72	22.500	PBC<MDA	TL208
582.89	125.	13.97	1.59	1.185E-02				
582.89	125.	13.97	1.59	1.185E-02	583.14	86.000	9.859E-02	TL208
609.62	169.	9.58	1.05	1.143E-02	609.32	46.090	2.560E-01	BI214
795.39	22.	38.66	1.50	9.301E-03	795.76	85.400	PBC<MDA	CS134
911.31	94.	13.09	0.85	8.400E-03	911.07	29.000	3.078E-01	AC228
969.20	79.	25.21	1.49	8.024E-03	968.90	17.460	4.659E-01	AC228
1120.52	53.	21.04	1.40	7.211E-03	1120.28	15.040	3.905E-01	BI214
1461.32	752.	3.71	1.66	5.930E-03	1460.75	10.700	9.620E+00	K40
1765.11	43.	14.74	0.81	5.142E-03	1764.51	15.920	4.344E-01	BI214

No unknown peaks passed sensitivity test.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-212	148.79	74.81	149.	60.	0.030	89.40	0.993D
PB-212	153.39	77.11	168.	51.	0.026	93.66	0.995A
PB-212	476.92	238.88	327.	342.	0.171	28.23	0.840
RA-224	482.92	241.88	376.	74.	0.037	116.02	1.500
PB-214	589.26	295.06	150.	135.	0.067	49.92	1.334
AC-228	676.15	338.50	134.	68.	0.034	79.84	1.500
PB-214	703.07	351.97	99.	214.	0.107	28.20	0.994
TL-208	1166.11	583.51	67.	96.	0.048	44.84	1.500s
BI-214	1218.34	609.62	47.	162.	0.081	28.75	1.055s
CS-134	1589.85	795.39	25.	22.	0.011	115.98	1.500s
AC-228	1822.09	911.53	26.	78.	0.039	41.42	1.505s
AC-228	1938.42	969.70	43.	51.	0.025	69.02	1.541
BI-214	2240.02	1120.52	27.	51.	0.025	63.11	1.403
K-40	2921.52	1461.32	28.	734.	0.367	11.13	1.660
BI-214	3528.98	1765.11	3.	43.	0.021	44.23	0.810s

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	Peak MDA Value pCi/gm	COMMENTS
BE-7		1.0164E-01					
			477.56	1.016E-01	%(	1.509E-01 4.78E-02 G	
K-40		9.6197E+00					
			1460.75	9.620E+00	(P	3.601E-01 3.66E-01 G	
MN-54		-4.5812E-03					
			834.81	-4.581E-03	&(P	3.227E-02 9.21E-03 G	
CO-57		-9.3680E-03					
			122.07	-9.368E-03	%(P	3.650E-02 1.09E-02 G K	
			136.43	-1.439E-01	%	3.119E-01 9.45E-02 G	
CO-60		-3.1699E-03					
			1332.51	-3.170E-03	&(P	2.845E-02 6.95E-03 G K	
			1173.23	-7.831E-03	% P	3.678E-02 1.02E-02 G K	

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
Sr-85	-4.4457E-03						
		514.00	-4.446E-03	%(	3.396E-02	9.91E-03	G
Kr-85	-9.9328E+01						
		513.99	-9.933E+01	%(	7.591E+02	2.22E+02	G
Y-88	-1.0789E-04						
		1836.01	-1.079E-04	&(P	1.263E-02	1.71E-03	G K
		898.02	8.720E-03	& P	2.234E-02	6.59E-03	G
NB-94	7.4360E-03						
		871.10	7.436E-03	%(	2.486E-02	7.27E-03	G K
		702.50	3.982E-03	&	2.863E-02	8.22E-03	G K
Ag-108M	9.7786E-04						
		722.95	9.779E-04	&(	4.525E-02	1.30E-02	G K
		614.37	-1.403E-02	% P	3.603E-02	1.08E-02	G
		433.93	3.166E-03	&	2.413E-02	6.96E-03	G
CD-109	7.9174E-01						
		88.04	7.917E-01	%(	1.384E+00	4.22E-01	G
SN-113	5.6205E-03						
		391.71	5.620E-03	%(	3.425E-02	9.96E-03	G K
		255.04	-2.761E-01	%	1.316E+00	3.91E-01	G
SB-125	-3.3244E-03						
		427.95	-3.324E-03	%(P	8.166E-02	2.34E-02	G K
		600.77	-3.827E-02	% P	1.593E-01	4.67E-02	G
		636.15	-1.663E-02	& P	2.301E-01	6.46E-02	G
		463.51	1.356E-01	% P	2.273E-01	6.98E-02	G
		176.29	-5.727E-02	%	4.714E-01	1.40E-01	G
I-131	1.0456E-02						
		364.48	1.046E-02	%(P	2.960E-02	8.80E-03	G K
		636.97	7.936E-03	%	4.516E-01	1.26E-01	G
		284.29	1.774E-01	% P	4.682E-01	1.40E-01	G
CS-134	1.3668E-02						
		604.66	5.730E-03	%(	2.561E-02	7.45E-03	G K
		795.76	2.274E-02	(P	2.709E-02	8.83E-03	G
		569.29	-2.007E-02	& P	1.641E-01	4.60E-02	G
		801.84	-1.421E-02	% P	2.728E-01	7.21E-02	G
CS-137	9.2812E-03						
		661.62	9.281E-03	%(P	3.103E-02	9.08E-03	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CE-139	8.8281E-03						
		165.85	8.828E-03	%(	3.473E-02	1.04E-02	G
EU-152	-2.8110E-02						
		121.78	-2.811E-02	%(P	1.064E-01	3.18E-02	G K
		344.30	2.092E-02	& P	8.152E-02	2.41E-02	G
		1408.08	4.801E-02	%	1.003E-01	3.07E-02	G
		964.00	9.894E-02	% P	2.237E-01	6.73E-02	G
		1112.07	3.899E-02	&	2.428E-01	6.92E-02	G
		778.90	2.986E-04	%	1.542E-01	4.12E-02	G
EU-154	8.2229E-05						
		123.10	8.223E-05	%(	7.495E-02	2.20E-02	G K
		1274.80	-1.166E-02	&	9.705E-02	2.73E-02	G
		723.30	-1.669E-02	&	1.493E-01	4.27E-02	G
		1004.80	2.342E-02	%	1.898E-01	5.39E-02	G
EU-155	1.0100E-01						
		86.45	1.010E-01	%(	1.731E-01	5.28E-02	G K
		105.31	1.760E-02	%	1.798E-01	5.33E-02	G
HG-203	3.0585E-04						
		279.17	3.058E-04	%(P	2.830E-02	8.18E-03	G K
		72.87	-7.816E-01	% P	1.816E+00	5.49E-01	G
		70.83	2.983E-03	%	3.306E+00	9.75E-01	G
		82.50	-3.050E-01	%	2.781E+00	8.24E-01	G
TL-208	7.8488E-02						
		583.14	7.849E-02	@(P	3.330E-02	1.23E-02	G
		510.72	6.579E-02	% P	1.446E-01	4.13E-02	G
PB-212	2.8465E-01						
		238.63	2.846E-01	(P	7.238E-02	2.77E-02	G K
							Energy duplication
		77.11	2.404E-01	} P	2.966E-01	7.51E-02	G
		74.81	5.756E-01	+ P	5.704E-01	1.80E-01	G
PB-214	2.7632E-01						
		351.99	2.701E-01	(P	6.207E-02	2.61E-02	G K
		295.22	2.884E-01	(P	1.281E-01	4.94E-02	G
							Energy duplication
		77.11	1.977E-01	} P	6.831E-01	1.54E-01	G
		241.92	2.942E-01	%	4.557E-01	1.40E-01	G
BI-212	1.2768E-01						
		727.17	1.277E-01	%(P	2.090E-01	6.48E-02	G K
		1620.56	-6.141E-02	% P	9.824E-01	2.59E-01	G
		785.42	6.633E-01	%	1.101E+00	3.44E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
BI-214	2.5604E-01						
		609.32	2.560E-01	@(P	5.458E-02	2.55E-02	G K
		1764.51	4.344E-01	+ P	1.132E-01	6.90E-02	G
		1120.28	3.905E-01	+ P	2.069E-01	8.52E-02	G
RA-224	6.8757E-01						
		241.00	6.876E-01	&(	8.609E-01	2.66E-01	G
RA-226	6.4058E-01						
		185.99	6.406E-01	%(P	8.778E-01	2.68E-01	G
AC-228	2.7546E-01						
		911.07	2.679E-01	(P	9.078E-02	3.86E-02	G K
		968.90	3.015E-01	(P	1.982E-01	6.96E-02	G
		338.40	2.560E-01	(P	2.144E-01	6.92E-02	G
TH-227	-4.4897E-02						
		236.00	-4.490E-02	%(	2.404E-01	7.13E-02	G K
		256.25	-1.099E-01	% P	3.717E-01	1.11E-01	G
PA-234	-1.7275E-03						
		98.44	-1.727E-03	%(P	1.663E-01	4.89E-02	G K
		946.00	1.157E-02	& P	1.403E-01	3.91E-02	G
		131.28	2.534E-03	& P	1.500E-01	4.41E-02	G
		94.67	-6.273E-02	% P	3.296E-01	9.84E-02	G
		883.24	5.685E-02	%	1.713E-01	5.01E-02	G
		926.70	7.967E-03	&	2.486E-01	6.85E-02	G
		569.26	-2.811E-02	& P	2.424E-01	6.78E-02	G
TH-234	1.6781E-02						
		63.29	1.678E-02	%(P	5.172E+00	1.52E+00	G K
		92.80	5.726E-01	% P	1.604E+00	4.78E-01	G
		92.38	6.274E-01	% P	1.957E+00	5.82E-01	G
AM-241	8.5274E-02						
		59.54	8.527E-02	%(P	8.536E-01	2.52E-01	G

(- This peak used in the nuclide activity average.

* - Peak is too wide, but only one peak in library.
! - Peak is part of a multiplet and this area went negative during deconvolution.
? - Peak is too narrow.
@ - Peak is too wide at FW25M, but ok at FWHM.
% - Peak fails sensitivity test.
$ - Peak identified, but first peak of this nuclide failed one or more qualification tests.

+ - Peak activity higher than counting uncertainty range.
- - Peak activity lower than counting uncertainty range.
= - Peak outside analysis energy range.
& - Calculated peak centroid is not close enough to the library energy centroid for positive identification.
P - Peakbackground subtraction
} - Peak is too close to another for the activity to be found directly.

Nuclide Codes:
T - Thermal Neutron Activation
F - Fast Neutron Activation
I - Fission Product
N - Naturally Occurring Isotope
P - Photon Reaction
C - Charged Particle Reaction
M - No MDA Calculation
R - Coincidence Corrected
H - Halflife limit exceeded

Peak Codes:
G - Gamma Ray
X - X-Ray
P - Positron Decay
S - Single-Escape
D - Double-Escape
K - Key Line
A - Not in Average
C - Coincidence Peak

- -

***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	9.7718E-02	1.0164E-01	1.4328E-01	1.4341E-01	1.451E-01
K-40		9.6197E+00	9.6197E+00	1.0984E+00	1.2323E+00	
MN-54	#A	-4.5504E-03	-4.5812E-03	3.1976E-02	3.1977E-02	3.206E-02
CO-57	#B	-9.2954E-03	-9.3680E-03	3.3997E-02	3.4001E-02	3.622E-02
CO-60	#B	-3.1664E-03	-3.1699E-03	4.5703E-01	4.5703E-01	2.842E-02
Sr-85	#A	-4.3038E-03	-4.4457E-03	2.9739E-02	2.9741E-02	3.288E-02
Kr-85	#A	-9.9326E+01	-9.9328E+01	6.6465E+02	6.6468E+02	7.590E+02
Y-88	#B	-1.0578E-04	-1.0789E-04	6.4735E-04	6.4738E-04	1.238E-02
NB-94	#B	7.4360E-03	7.4360E-03	2.1798E-02	2.1802E-02	2.486E-02
Ag-108M	#B	9.7782E-04	9.7786E-04	3.9037E-02	3.9037E-02	4.525E-02
CD-109	#A	7.8808E-01	7.9174E-01	1.2657E+00	1.2665E+00	1.377E+00
SN-113	#B	5.5187E-03	5.6205E-03	2.9878E-02	2.9879E-02	3.363E-02
SB-125	#B	-3.3175E-03	-3.3244E-03	7.3128E-02	7.3128E-02	8.149E-02
I-131	#B	8.0500E-03	1.0456E-02	2.6390E-02	2.6397E-02	2.279E-02
CS-134	#B	1.3630E-02	1.3668E-02	1.5916E-02	1.5936E-02	2.554E-02
CS-137	#A	9.2794E-03	9.2812E-03	2.7232E-02	2.7238E-02	3.103E-02
CE-139	#A	8.6941E-03	8.8281E-03	3.1143E-02	3.1147E-02	3.421E-02
EU-152	#B	-2.8097E-02	-2.8110E-02	1.0351E-01	1.0352E-01	1.064E-01
EU-154	#B	8.2174E-05	8.2229E-05	6.6089E-02	6.6089E-02	7.490E-02
EU-155	#B	1.0089E-01	1.0100E-01	1.5837E-01	1.5847E-01	1.729E-01
HG-203	#B	2.9235E-04	3.0585E-04	2.4538E-02	2.4538E-02	2.705E-02
TL-208	#	7.8488E-02	7.8488E-02	3.6774E-02	3.7055E-02	3.330E-02
PB-212		2.8465E-01	2.8465E-01	8.3181E-02	8.4807E-02	
PB-214		2.7632E-01	2.7632E-01	7.9977E-02	8.1570E-02	
BI-212	#B	1.2768E-01	1.2768E-01	1.9439E-01	1.9453E-01	2.090E-01

BI-214	2.5604E-01	2.5604E-01	7.6550E-02	7.7980E-02

RA-224	#A	6.8757E-01	6.8757E-01	7.9771E-01	7.9870E-01	8.609E-01
RA-226	#A	6.4057E-01	6.4058E-01	8.0368E-01	8.0454E-01	8.778E-01
AC-228	#	2.7546E-01	2.7546E-01	1.0565E-01	1.0686E-01	9.078E-02
TH-227	#B	-4.4897E-02	-4.4897E-02	2.1403E-01	2.1404E-01	2.404E-01
PA-234	#B	-1.7275E-03	-1.7275E-03	7.4621E+00	7.4621E+00	1.663E-01
TH-234	#B	1.6781E-02	1.6781E-02	4.5522E+00	4.5522E+00	5.172E+00
AM-241	#A	8.5273E-02	8.5274E-02	7.5707E-01	7.5709E-01	8.536E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (118.4 to 2000.7 keV) 1.0436728E+01 pCi/gm
Total Decayed Activity (118.4 to 2000.7 keV) 1.0436728E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JJM

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 103F_22AUG2006_1244.An1

Sample description
FSS-OOL-05-04-076-F-RC

Spectrum Filename: C:\GammaVision\Spectra\103F_22AUG2006_1244.An1

Acquisition information
Start time: 22-Aug-2006 12:44:27
Live time: 2000
Real time: 2001
Dead time: 0.06 %
Detector ID: 4

Detector system
Det 103 - DSPE-471

Calibration
Filename: D3_1LSa.Clb
Detector_103 1.0 Liter Sand Geometry

Energy Calibration
Created: 08-Aug-2005 11:09:41
Zero offset: 0.409 keV
Gain: 0.500 keV/channel
Quadratic: 1.092E-08 keV/channel^2

Efficiency Calibration
Created: 08-Aug-2005 11:11:25
Type: Polynomial
Uncertainty: 0.993 %
Coefficients: -0.264059 -5.138468 0.638383
-0.089199 0.005011 -0.000129

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.41keV)
Stop channel: 4000 (2000.67keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 1.6290E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.6290E+03) =
6.1387E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	19-Aug-2006 11:00:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	103_150K_05AUG05.Pbc 08-Aug-2005 12:54:15
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 11 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.3720

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
74.89	55.	34.94	0.99	9.052E-03	74.81	9.600	PBC<MDA	PB212
76.23	148.	21.02	1.04	9.709E-03	77.11	17.500	6.772E-01	PB212
					77.11	10.700	1.108E+00	PB214
238.78	388.	6.24	1.09	2.320E-02	238.63	43.100	3.116E-01	PB212
242.11	70.	24.80	1.10	2.302E-02	241.00	3.900	6.442E-01	RA224
					241.92	7.470	3.370E-01	PB214
295.18	146.	15.73	1.11	2.025E-02	295.22	19.200	3.027E-01	PB214
338.84	85.	21.52	1.08	1.828E-02	338.40	12.010	3.167E-01	AC228
352.11	246.	9.33	1.29	1.775E-02	351.99	37.100	3.024E-01	PB214
463.43	28.	37.82	1.50	1.425E-02	463.51	10.000	PBC<MDA	SB125
486.80	37.	41.43	0.80	1.369E-02				
583.29	160.	12.83	1.43	1.184E-02	583.14	86.000	1.270E-01	TL208
609.41	193.	10.72	1.22	1.144E-02	609.32	46.090	2.941E-01	BI214
727.58	39.	25.50	1.48	9.965E-03	727.17	11.800	2.766E-01	BI212
911.56	105.	16.76	1.84	8.398E-03	911.07	29.000	3.454E-01	AC228
969.46	27.	35.40	1.54	8.026E-03	968.90	17.460	PBC<MDA	AC228
1121.03	56.	25.74	0.77	7.208E-03	1120.28	15.040	4.138E-01	BI214
1461.43	662.	3.98	1.80	5.930E-03	1460.75	10.700	8.402E+00	K40
1765.24	28.	17.96	1.94	5.142E-03	1764.51	15.920	2.810E-01	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
151.63	76.23	326.	148.	0.074	63.06	1.038	PB-214	l
972.73	486.80	66.	37.	0.019	124.29	0.797	LA-140	s

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-212	148.79	74.81	183.	55.	0.028	104.81	0.993D
PB-212	476.61	238.73	202.	293.	0.147	25.74	0.940
RA-224	483.36	242.10	246.	70.	0.035	101.43	1.500
PB-214	482.19	241.52	263.	60.	0.030	121.62	1.500
PB-214	589.50	295.18	145.	142.	0.071	47.20	1.106s
AC-228	676.46	338.66	106.	65.	0.033	75.09	1.500
PB-214	703.36	352.11	96.	240.	0.120	27.99	1.293s
SB-125	925.98	463.43	47.	28.	0.014	113.45	1.500s
TL-208	1165.97	583.44	59.	127.	0.063	35.55	1.500s
BI-214	1217.92	609.41	76.	187.	0.093	32.17	1.217
BI-212	1454.23	727.58	28.	39.	0.020	76.50	1.483s
AC-228	1822.58	911.77	45.	70.	0.035	51.31	1.505s
AC-228	1937.93	969.46	32.	27.	0.013	106.21	1.541s
BI-214	2241.04	1121.03	48.	54.	0.027	77.22	0.773s
K-40	2921.73	1461.43	27.	643.	0.321	11.94	1.802
BI-214	3529.23	1765.24	3.	28.	0.014	53.88	1.938

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	MDA Value pCi/gm	COMMENTS
BE-7		5.9594E-02					
			477.56	5.959E-02	%(	2.333E-01 6.85E-02	G
K-40		8.4022E+00					
			1460.75	8.402E+00	(P	3.526E-01 3.44E-01	G
MN-54		3.0795E-03					
			834.81	3.079E-03	%(P	2.670E-02 7.51E-03	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CO-57	-4.4580E-03						
		122.07	-4.458E-03	%(P	3.800E-02	1.13E-02	G K
		136.43	-3.218E-02	%	3.045E-01	9.04E-02	G
CO-60	-3.4625E-03						
		1332.51	-3.462E-03	%(P	4.145E-02	1.11E-02	G K
		1173.23	-2.322E-03	% P	4.965E-02	1.39E-02	G K
Sr-85	3.9581E-03						
		514.00	3.958E-03	&(	3.304E-02	9.62E-03	G
Kr-85	8.8335E+01						
		513.99	8.833E+01	&(	7.381E+02	2.15E+02	G
Y-88	3.2607E-03						
		1836.01	3.261E-03	%(P	1.807E-02	4.69E-03	G K
		898.02	-6.696E-04	& P	3.452E-02	9.53E-03	G
NB-94	4.9859E-03						
		871.10	4.986E-03	%(	2.360E-02	6.74E-03	G K
		702.50	3.710E-03	%	2.177E-02	6.19E-03	G K
Ag-108M	9.2860E-03						
		722.95	9.286E-03	%(	2.070E-02	6.25E-03	G K
		614.37	-1.956E-03	& P	3.463E-02	9.91E-03	G
		433.93	-3.591E-03	%	2.438E-02	7.05E-03	G
CD-109	-1.0331E-01						
		88.04	-1.033E-01	%(	1.500E+00	4.45E-01	G
SN-113	-4.1983E-03						
		391.71	-4.198E-03	%(	4.187E-02	1.22E-02	G K
		255.04	0.000E+00	&	1.330E+00	3.89E-01	G
SB-125	4.7662E-02						
		427.95	9.086E-03	&(P	7.150E-02	2.06E-02	G K
		600.77	3.953E-04	& P	1.411E-01	3.96E-02	G
		636.15	-3.281E-03	& P	1.583E-01	4.20E-02	G
		463.51	1.618E-01	(P	2.021E-01	6.40E-02	G
		176.29	5.980E-02	&	4.047E-01	1.20E-01	G
I-131	-2.3760E-03						
		364.48	-2.376E-03	%(P	3.935E-02	1.13E-02	G K
		636.97	-1.413E-02	&	4.206E-01	1.17E-01	G
		284.29	2.261E-01	% P	5.013E-01	1.52E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CS-134	0.0000E+00						
		604.66	0.000E+00	%(	5.168E-02	1.51E-02	G K
		795.76	1.525E-02	% P	3.142E-02	9.54E-03	G
		569.29	-1.230E-02	% P	2.048E-01	5.81E-02	G
		801.84	-1.686E-02	& P	2.991E-01	8.02E-02	G
CS-137	1.8929E-02						
		661.62	1.893E-02	%(P	2.874E-02	8.93E-03	G
CE-139	-1.2799E-03						
		165.85	-1.280E-03	&(	3.722E-02	1.10E-02	G
EU-152	-1.3705E-02						
		121.78	-1.370E-02	%(P	1.107E-01	3.28E-02	G K
		344.30	-2.388E-02	% P	8.937E-02	2.65E-02	G
		1408.08	3.599E-02	%	9.547E-02	2.81E-02	G
		964.00	-2.860E-04	% P	2.247E-01	6.22E-02	G
		1112.07	-8.590E-02	%	2.737E-01	8.08E-02	G
		778.90	-1.972E-03	%	2.050E-01	5.68E-02	G
EU-154	-1.8352E-02						
		123.10	-1.835E-02	%(	7.499E-02	2.24E-02	G K
		1274.80	-4.375E-03	%	1.301E-01	3.68E-02	G
		723.30	-4.483E-03	%	2.427E-01	7.03E-02	G
		1004.80	-1.077E-02	%	1.684E-01	4.68E-02	G
EU-155	-1.1100E-02						
		86.45	-1.110E-02	&(	1.809E-01	5.36E-02	G K
		105.31	4.562E-02	%	1.676E-01	5.02E-02	G
HG-203	1.3827E-02						
		279.17	1.383E-02	&(P	3.144E-02	9.50E-03	G K
		72.87	-3.037E-01	% P	1.847E+00	5.51E-01	G
		70.83	2.822E-01	%	3.375E+00	1.00E+00	G
		82.50	1.372E+00	%	2.758E+00	8.37E-01	G
TL-208	1.0317E-01						
		583.14	1.032E-01	@(P	3.143E-02	1.26E-02	G
		510.72	2.295E-02	% P	1.586E-01	4.42E-02	G
PB-212	2.4312E-01						
		238.63	2.431E-01	(P	5.719E-02	2.17E-02	G K
							Energy duplication
		77.11	1.556E-01	} P	3.011E-01	7.36E-02	G
		74.81	5.288E-01	+ P	6.270E-01	1.95E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
PB-214	3.0077E-01						
		351.99	3.024E-01	@(P	6.090E-02	2.89E-02	G K
		295.22	3.027E-01	@(P	1.256E-01	4.90E-02	G
							Energy duplication
		77.11	2.210E-01	} P	6.987E-01	1.64E-01	G
		241.92	2.880E-01	(	3.777E-01	1.17E-01	G
BI-212	2.7660E-01						
		727.17	2.766E-01	@(P	1.924E-01	7.15E-02	G K
		1620.56	1.259E-01	% P	8.001E-01	2.14E-01	G
		785.42	0.000E+00	%	1.223E+00	3.35E-01	G
BI-214	2.9075E-01						
		609.32	2.941E-01	(P	6.821E-02	3.26E-02	G K
		1764.51	2.810E-01	(P	1.129E-01	5.64E-02	G
		1120.28	4.138E-01	+ P	2.674E-01	1.10E-01	G
RA-224	6.4693E-01						
		241.00	6.469E-01	&(	6.993E-01	2.19E-01	G
RA-226	4.4427E-01						
		185.99	4.443E-01	%(P	8.867E-01	2.67E-01	G
AC-228	2.4062E-01						
		911.07	2.381E-01	(P	1.160E-01	4.27E-02	G K
		968.90	1.588E-01	& P	1.727E-01	5.65E-02	G
		338.40	2.468E-01	(P	1.916E-01	6.28E-02	G
TH-227	3.3780E-03						
		236.00	3.378E-03	%(	3.067E-01	9.05E-02	G K
		256.25	-1.899E-04	& P	3.819E-01	1.11E-01	G
PA-234	4.9181E-02						
		98.44	4.918E-02	%(P	1.678E-01	5.03E-02	G K
		946.00	7.587E-05	& P	1.528E-01	4.22E-02	G
		131.28	-5.064E-03	& P	1.537E-01	4.53E-02	G
		94.67	-3.256E-02	& P	2.413E-01	7.13E-02	G
		883.24	-5.804E-03	&	2.457E-01	6.83E-02	G
		926.70	-4.670E-02	%	2.621E-01	7.50E-02	G
		569.26	-1.819E-02	% P	3.030E-01	8.59E-02	G
TH-234	-7.7333E-01						
		63.29	-7.733E-01	&(P	5.240E+00	1.54E+00	G K
		92.80	3.668E-01	% P	1.633E+00	4.83E-01	G
		92.38	4.419E-01	% P	1.922E+00	5.69E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
AM-241	2.2835E-01						
		59.54	2.284E-01	&(P	7.902E-01	2.36E-01	G

(- This peak used in the nuclide activity average.

* - Peak is too wide, but only one peak in library.
! - Peak is part of a multiplet and this area went negative during deconvolution.
? - Peak is too narrow.
@ - Peak is too wide at FW25M, but ok at FWHM.
% - Peak fails sensitivity test.
$ - Peak identified, but first peak of this nuclide failed one or more qualification tests.
+ - Peak activity higher than counting uncertainty range.
- - Peak activity lower than counting uncertainty range.
= - Peak outside analysis energy range.
& - Calculated peak centroid is not close enough to the library energy centroid for positive identification.
P - Peakbackground subtraction
} - Peak is too close to another for the activity to be found directly.

Nuclide Codes:
T - Thermal Neutron Activation
F - Fast Neutron Activation
I - Fission Product
N - Naturally Occurring Isotope
P - Photon Reaction
C - Charged Particle Reaction
M - No MDA Calculation
R - Coincidence Corrected
H - Halflife limit exceeded

Peak Codes:
G - Gamma Ray
X - X-Ray
P - Positron Decay
S - Single-Escape
D - Double-Escape
K - Key Line
A - Not in Average
C - Coincidence Peak

- -

***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	5.7264E-02	5.9594E-02	2.0555E-01	2.0557E-01	2.242E-01
K-40		8.4022E+00	8.4022E+00	1.0326E+00	1.1420E+00	
MN-54	#A	3.0585E-03	3.0795E-03	2.2529E-02	2.2530E-02	2.652E-02
CO-57	#B	-4.4230E-03	-4.4580E-03	3.6621E-02	3.6622E-02	3.770E-02
CO-60	#B	-3.4586E-03	-3.4625E-03	1.7632E-01	1.7632E-01	4.141E-02
Sr-85	#A	3.8302E-03	3.9581E-03	2.8862E-02	2.8863E-02	3.197E-02
Kr-85	#A	8.8333E+01	8.8335E+01	6.4478E+02	6.4480E+02	7.381E+02
Y-88	#B	3.1962E-03	3.2607E-03	1.4077E-02	1.4079E-02	1.771E-02
NB-94	#B	4.9859E-03	4.9859E-03	2.0217E-02	2.0219E-02	2.360E-02
Ag-108M	#B	9.2856E-03	9.2860E-03	1.8754E-02	1.8761E-02	2.070E-02
CD-109	#A	-1.0283E-01	-1.0331E-01	1.3340E+00	1.3340E+00	1.493E+00

SN-113	#B	-4.1213E-03	-4.1983E-03	3.6546E-02	3.6546E-02	4.110E-02
SB-125	#B	4.7562E-02	4.7662E-02	5.6557E-02	5.6624E-02	7.135E-02
I-131	#B	-1.8231E-03	-2.3760E-03	5.3396E-02	5.3397E-02	3.019E-02
CS-134	#B	0.0000E+00	0.0000E+00	4.5223E-02	4.5223E-02	5.153E-02
CS-137	#A	1.8925E-02	1.8929E-02	2.6778E-02	2.6801E-02	2.874E-02
CE-139	#A	-1.2602E-03	-1.2799E-03	3.2963E-02	3.2963E-02	3.665E-02
EU-152	#B	-1.3698E-02	-1.3705E-02	1.1653E-01	1.1653E-01	1.107E-01
EU-154	#B	-1.8340E-02	-1.8352E-02	6.7203E-02	6.7211E-02	7.493E-02
EU-155	#B	-1.1087E-02	-1.1100E-02	1.6083E-01	1.6083E-01	1.807E-01
HG-203	#B	1.3209E-02	1.3827E-02	2.8499E-02	2.8510E-02	3.003E-02
TL-208	#	1.0317E-01	1.0317E-01	3.7929E-02	3.8399E-02	3.143E-02
PB-212		2.4312E-01	2.4312E-01	6.5144E-02	6.6655E-02	
PB-214		3.0077E-01	3.0077E-01	8.6175E-02	8.7926E-02	
BI-212	#	2.7660E-01	2.7660E-01	2.1427E-01	2.1487E-01	
BI-214		2.9075E-01	2.9075E-01	9.6765E-02	9.8227E-02	
RA-224	#A	6.4693E-01	6.4693E-01	6.5621E-01	6.5728E-01	6.993E-01
RA-226	#A	4.4427E-01	4.4427E-01	8.0073E-01	8.0114E-01	8.867E-01
AC-228	#	2.4062E-01	2.4062E-01	1.1236E-01	1.1322E-01	1.160E-01
TH-227	#B	3.3780E-03	3.3780E-03	2.7157E-01	2.7157E-01	3.067E-01
PA-234	#B	4.9181E-02	4.9181E-02	1.5085E-01	1.5088E-01	1.678E-01
TH-234	#B	-7.7333E-01	-7.7333E-01	1.0092E+01	1.0092E+01	5.240E+00
AM-241	#A	2.2835E-01	2.2835E-01	7.0909E-01	7.0921E-01	7.902E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (185.9 to 2000.7 keV) 9.5134106E+00 pCi/gm
Total Decayed Activity (185.9 to 2000.7 keV) 9.5134106E+00 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JPK

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 103F_24AUG2006_0923.An1

Sample description
FSS-OOL-05-04-091-F-I

Spectrum Filename: C:\GammaVision\Spectra\103F_24AUG2006_0923.An1

Acquisition information
Start time: 24-Aug-2006 09:23:02
Live time: 2000
Real time: 2003
Dead time: 0.14 %
Detector ID: 4

Detector system
Det 103 - DSPE-471

Calibration
Filename: D3_1LSa.Clb
Detector_103 1.0 Liter Sand Geometry

Energy Calibration
Created: 08-Aug-2005 11:09:41
Zero offset: 0.409 keV
Gain: 0.500 keV/channel
Quadratic: 1.092E-08 keV/channel^2

Efficiency Calibration
Created: 08-Aug-2005 11:11:25
Type: Polynomial
Uncertainty: 0.993 %
Coefficients: -0.264059 -5.138468 0.638383
-0.089199 0.005011 -0.000129

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.41keV)
Stop channel: 4000 (2000.67keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 1.8670E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.8670E+03) =
5.3562E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	23-Aug-2006 16:32:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	103_150K_05AUG05.Pbc 08-Aug-2005 12:54:15
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 20 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.1940

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
74.92	186.	17.53	0.99	9.052E-03	74.81	9.600	1.548E+00	PB212
77.22	248.	10.69	0.99	1.011E-02	77.11	17.500	1.095E+00	PB212
87.39	150.	22.06	1.00	1.448E-02	86.45	32.740	2.346E-01	EU155
					88.04	3.790	1.943E+00	CD109
89.72	80.	40.34	1.00	1.536E-02				
93.25	132.	24.91	1.00	1.661E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
					94.67	15.500	PBC<MDA	PA234
186.35	292.	15.30	1.38	2.565E-02	185.99	3.280	2.403E+00	RA226
209.52	195.	14.94	1.08	2.470E-02				
238.74	1736.	2.76	1.09	2.320E-02	238.63	43.100	1.248E+00	PB212
241.25	243.	14.61	1.09	2.306E-02	241.00	3.900	1.956E+00	RA224
					241.92	7.470	1.023E+00	PB214
270.52	137.	21.17	1.29	2.150E-02				
295.45	271.	13.67	1.09	2.024E-02	295.22	19.200	4.963E-01	PB214
300.55	100.	28.28	0.94	1.999E-02				
327.98	105.	30.89	1.03	1.874E-02				
338.50	379.	10.50	1.11	1.830E-02	338.40	12.010	1.244E+00	AC228
351.98	572.	7.57	1.21	1.775E-02	351.99	37.100	6.228E-01	PB214
408.88	93.	28.55	1.60	1.576E-02				
463.28	132.	17.30	1.32	1.425E-02				
463.28	132.	17.30	1.32	1.425E-02	463.51	10.000	6.619E-01	SB125
510.81	240.	14.41	1.31	1.317E-02	510.72	22.500	5.205E-01	TL208
583.19	553.	6.10	1.38	1.184E-02	583.14	86.000	3.902E-01	TL208
609.40	414.	7.04	1.25	1.144E-02	609.32	46.090	5.599E-01	BI214
727.55	168.	13.62	1.90	9.961E-03	727.17	11.800	1.034E+00	BI212
768.86	66.	30.51	1.36	9.548E-03				

794.72	89.	20.97	1.62	9.311E-03				
794.72	89.	20.97	1.62	9.311E-03	795.76	85.400	8.144E-02	CS134
835.53	34.	36.02	1.24	8.964E-03	834.81	99.978	PBC<MDA	MN54
860.34	85.	22.99	1.13	8.769E-03				
911.27	420.	6.32	1.24	8.400E-03	911.07	29.000	1.238E+00	AC228
964.38	54.	25.02	1.54	8.054E-03	964.00	14.580	PBC<MDA	EU152
969.30	254.	7.32	1.54	8.023E-03	968.90	17.460	1.312E+00	AC228
1121.28	102.	18.91	1.33	7.207E-03	1120.28	15.040	6.680E-01	BI214
1238.64	69.	35.09	1.44	6.700E-03				
1461.13	1686.	2.48	1.94	5.931E-03	1460.75	10.700	1.902E+01	K40
1588.99	83.	15.61	1.16	5.570E-03				

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
1621.32	36.	20.63	0.77	5.488E-03	1620.56	2.750	1.715E+00	BI212
1764.66	80.	11.78	2.46	5.141E-03	1764.51	15.920	6.820E-01	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
178.61	89.73	483.	80.	0.040	121.03	1.002	PB-214	lD
418.31	209.57	604.	186.	0.093	63.88	1.083	AC-228	
540.19	270.52	319.	137.	0.068	63.52	1.294	AC-228	s
600.25	300.55	318.	100.	0.050	84.83	0.937	PB-212	s
655.10	327.98	354.	105.	0.053	92.67	1.029	AC-228	
816.89	408.88	226.	93.	0.046	85.64	1.598	CS-138	s
1536.79	768.86	118.	66.	0.033	91.52	1.356	BI-214	
1719.73	860.34	86.	85.	0.042	68.98	1.129	TL-208	s
1928.57	964.39	56.	63.	0.031	63.44	1.538	AC-228	D
2476.21	1238.64	151.	69.	0.034	105.27	1.439	CO-56	s
3176.81	1588.99	16.	83.	0.041	46.83	1.163	AC-228	s

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-212	148.79	74.81	457.	186.	0.093	52.60	0.993D
PB-212	153.39	77.11	494.	248.	0.124	32.08	0.995A
CD-109	173.52	87.17	1109.	135.	0.068	107.72	1.500
PA-234	185.69	93.26	914.	143.	0.072	92.64	1.500s
RA-226	371.76	186.30	946.	245.	0.122	53.68	1.500s
PB-212	476.42	238.63	315.	1721.	0.860	8.37	1.093D
RA-224	481.16	241.00	1343.	159.	0.080	101.41	1.095D
PB-214	483.00	241.92	464.	146.	0.073	51.67	1.095A
PB-214	590.04	295.45	426.	267.	0.133	41.02	1.090
AC-228	676.14	338.50	403.	378.	0.189	31.51	1.108
PB-214	703.11	351.98	401.	567.	0.283	22.71	1.212
SB-125	925.40	463.14	177.	115.	0.057	55.99	1.500s
TL-208	1020.73	510.81	292.	213.	0.107	43.24	1.313s
TL-208	1165.48	583.19	187.	549.	0.275	18.29	1.381s
BI-214	1217.90	609.40	147.	408.	0.204	21.12	1.249
BI-212	1454.18	727.55	124.	168.	0.084	40.86	1.900s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
CS-134	1588.65	794.80	70.	70.	0.035	62.40	1.500s
MN-54	1670.11	835.53	58.	34.	0.017	108.07	1.240
AC-228	1821.57	911.27	87.	417.	0.208	18.97	1.240
AC-228	1936.81	968.90	48.	254.	0.127	22.09	1.541D
BI-214	2241.53	1121.28	92.	100.	0.050	56.73	1.334s
K-40	2921.13	1461.13	36.	1667.	0.834	7.43	1.936
BI-212	3241.46	1621.32	5.	36.	0.018	61.88	0.765s
BI-214	3528.08	1764.66	6.	77.	0.039	35.35	2.463s

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Code	MDA Value pCi/gm	COMMENTS
BE-7		0.0000E+00					
			477.56	0.000E+00	%(	3.986E-01 1.17E-01	G
K-40		1.9015E+01					
			1460.75	1.902E+01	(P	3.476E-01 4.76E-01	G
MN-54		2.7194E-02					
			834.81	2.719E-02	(P	3.097E-02 9.91E-03	G
CO-57		-1.9902E-02					
			122.07	-1.990E-02	%(P	5.920E-02 1.79E-02	G K
			136.43	-1.198E-01	%	4.538E-01 1.37E-01	G
CO-60		-3.0185E-03					
			1332.51	-3.019E-03	&(P	5.256E-02 1.48E-02	G K
			1173.23	9.427E-03	% P	5.063E-02 1.48E-02	G K
Sr-85		-1.5686E-02					
			514.00	-1.569E-02	%(	4.752E-02 1.43E-02	G
Kr-85		-3.6213E+02					
			513.99	-3.621E+02	%(	1.089E+03 3.27E+02	G
Y-88		-7.8144E-04					
			1836.01	-7.814E-04	&(P	2.814E-02 7.38E-03	G K
			898.02	-2.838E-04	& P	3.316E-02 9.27E-03	G
NB-94		5.5036E-03					
			871.10	5.504E-03	%(	3.352E-02 9.73E-03	G K
			702.50	-9.284E-03	%	4.332E-02 1.28E-02	G K

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
Ag-108M	-1.1495E-02						
		722.95	-1.150E-02	%(	2.568E-02	7.75E-03	G K
		614.37	-3.215E-02	& P	4.641E-02	1.43E-02	G
		433.93	-5.705E-04	&	3.918E-02	1.15E-02	G
CD-109	1.7548E+00						
		88.04	1.755E+00	(	2.051E+00	6.30E-01	G
SN-113	-2.6177E-04						
		391.71	-2.618E-04	%(	5.474E-02	1.60E-02	G K
		255.04	-5.930E-01	%	1.745E+00	5.26E-01	G
SB-125	1.3906E-01						
		427.95	-1.061E-02	%(P	1.118E-01	3.29E-02	G K
		600.77	-1.786E-02	% P	1.807E-01	5.26E-02	G
		636.15	-3.381E-03	% P	3.561E-01	1.03E-01	G
		463.51	5.821E-01	*(P	3.288E-01	1.10E-01	G
		176.29	-5.276E-02	%	6.239E-01	1.86E-01	G
I-131	3.0915E-03						
		364.48	3.091E-03	&(P	4.363E-02	1.28E-02	G K
		636.97	-4.344E-03	%	5.113E-01	1.47E-01	G
		284.29	2.688E-03	% P	6.281E-01	1.86E-01	G
CS-134	3.5949E-02						
		604.66	1.189E-02	%(	2.601E-02	7.87E-03	G K
		795.76	6.344E-02	*(P	3.808E-02	1.32E-02	G
		569.29	9.365E-03	& P	2.221E-01	6.43E-02	G
		801.84	-1.925E-02	% P	3.541E-01	9.90E-02	G
CS-137	1.4406E-02						
		661.62	1.441E-02	%(P	4.180E-02	1.25E-02	G
CE-139	-1.0305E-02						
		165.85	-1.031E-02	%(	5.414E-02	1.63E-02	G
EU-152	-5.8674E-02						
		121.78	-5.867E-02	%(P	1.734E-01	5.23E-02	G K
		344.30	1.407E-02	% P	1.289E-01	3.82E-02	G
		1408.08	4.518E-02	&	1.554E-01	4.54E-02	G
		964.00	2.484E-01	% P	3.486E-01	1.08E-01	G
		1112.07	1.850E-02	&	2.783E-01	7.93E-02	G
		778.90	6.136E-02	%	2.742E-01	8.07E-02	G
EU-154	-4.2750E-02						
		123.10	-4.275E-02	%(	1.284E-01	3.88E-02	G K
		1274.80	-2.398E-02	%	1.443E-01	4.21E-02	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          723.30-1.251E-01 %   2.656E-01 8.05E-02 G
                         1004.80-5.838E-03 &   2.688E-01 7.74E-02 G

EU-155       1.8823E-01
                           86.45 1.882E-01 %(  2.621E-01 8.01E-02 G K
                          105.31 6.236E-02 %   2.687E-01 8.08E-02 G

HG-203       1.5447E-02
                          279.17 1.545E-02 %(P 3.947E-02 1.19E-02 G K
                           72.87-9.936E-01 % P 2.504E+00 7.57E-01 G
                           70.83-1.763E+00 &   4.458E+00 1.35E+00 G
                           82.50-1.155E+00 %   4.231E+00 1.27E+00 G

TL-208       3.9016E-01
                          583.14 3.902E-01 @(P 4.719E-02 2.40E-02 G
                          510.72 5.205E-01 + P 2.010E-01 8.44E-02 G

PB-212       1.2458E+00
                          238.63 1.246E+00  (P 6.182E-02 3.50E-02 G K
                                                          Energy duplication
                           77.11 1.016E+00 } P 4.347E-01 1.09E-01 G
                           74.81 1.548E+00 + P 8.525E-01 2.76E-01 G

PB-214       6.1432E-01
                          351.99 6.228E-01  (P 1.056E-01 4.76E-02 G K
                          295.22 4.963E-01 - P 1.842E-01 6.89E-02 G
                                                          Energy duplication
                           77.11 0.000E+00 } P 9.924E-01 0.00E+00 G
                          241.92 6.143E-01 }   4.339E-01 1.06E-01 G

BI-212       1.0342E+00
                          727.17 1.034E+00  (P 3.361E-01 1.41E-01 G K
                         1620.56 1.715E+00 + P 6.418E-01 3.54E-01 G
                          785.42-1.551E-02 %   1.944E+00 5.59E-01 G

BI-214       5.8649E-01
                          609.32 5.599E-01  (P 8.133E-02 4.00E-02 G K
                         1764.51 6.820E-01 + P 1.238E-01 8.38E-02 G
                         1120.28 6.680E-01 *(P 3.162E-01 1.29E-01 G

RA-224       1.2825E+00
                                                          Derived Ave Activity
                          241.00 1.282E+00 }(  1.396E+00 4.43E-01 G

RA-226       2.1028E+00
                          185.99 2.103E+00 *(P 1.255E+00 3.96E-01 G

AC-228       1.2612E+00
                          911.07 1.238E+00  (P 1.375E-01 7.89E-02 G K
                          968.90 1.312E+00  (P 1.808E-01 9.66E-02 G
```

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 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          338.40 1.244E+00  (P 3.170E-01 1.31E-01 G

TH-227      -1.5415E-01
                          236.00-1.541E-01 %(  4.280E-01 1.29E-01 G K
                          256.25-1.646E-01 % P 4.777E-01 1.44E-01 G

PA-234       1.2014E-01
                           98.44-4.777E-02 &(P 2.587E-01 7.77E-02 G K
                          946.00-3.209E-02 & P 2.133E-01 6.22E-02 G
                          131.28-1.142E-01 % P 2.430E-01 7.37E-02 G
                           94.67 3.920E-01 ?(P 3.925E-01 1.21E-01 G
                          883.24 1.023E-01 %   2.841E-01 8.48E-02 G
                          926.70-3.147E-02 %   3.015E-01 8.64E-02 G
                          569.26 1.391E-02 & P 3.293E-01 9.53E-02 G

TH-234       2.1052E+00
                           63.29 2.105E+00 %(P 7.064E+00 2.12E+00 G K
                           92.80 1.711E+00 % P 2.438E+00 7.42E-01 G
                           92.38 1.976E+00 % P 2.911E+00 8.86E-01 G

AM-241      -1.3082E-01
                           59.54-1.308E-01 &(P 1.231E+00 3.68E-01 G
   ( - This peak used in the nuclide activity average.

   * - Peak is too wide, but only one peak in library.
   ! - Peak is part of a multiplet and this area went
       negative during deconvolution.
   ? - Peak is too narrow.
   @ - Peak is too wide at FW25M, but ok at FWHM.
   % - Peak fails sensitivity test.
   $ - Peak identified, but first peak of this nuclide
       failed one or more qualification tests.
   + - Peak activity higher than counting uncertainty range.
   - - Peak activity lower than counting uncertainty range.
   = - Peak outside analysis energy range.
   & - Calculated peak centroid is not close enough to the
       library energy centroid for positive identification.
   P - Peakbackground subtraction
   } - Peak is too close to another for the activity
       to be found directly.

   Nuclide Codes:                      Peak Codes:
   T - Thermal Neutron Activation      G - Gamma Ray
   F - Fast Neutron Activation         X - X-Ray
   I - Fission Product                 P - Positron Decay
   N - Naturally Occurring Isotope     S - Single-Escape
   P - Photon Reaction                 D - Double-Escape
   C - Charged Particle Reaction       K - Key Line
```

M - No MDA Calculation
R - Coincidence Corrected
H - Halflife limit exceeded
A - Not in Average
C - Coincidence Peak

- -

***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	0.0000E+00	0.0000E+00	3.5035E-01	3.5035E-01	3.950E-01
K-40		1.9015E+01	1.9015E+01	1.4284E+00	1.8053E+00	
MN-54	A	2.7152E-02	2.7194E-02	2.9700E-02	2.9742E-02	
CO-57	#B	-1.9866E-02	-1.9902E-02	5.4448E-02	5.4459E-02	5.910E-02
CO-60	#B	-3.0177E-03	-3.0185E-03	2.3475E-01	2.3475E-01	5.255E-02
Sr-85	#A	-1.5568E-02	-1.5686E-02	4.2819E-02	4.2828E-02	4.717E-02
Kr-85	#A	-3.6213E+02	-3.6213E+02	9.8164E+02	9.8186E+02	1.089E+03
Y-88	#B	-7.7788E-04	-7.8144E-04	2.8086E-02	2.8086E-02	2.801E-02
NB-94	#B	5.5036E-03	5.5036E-03	2.9178E-02	2.9180E-02	3.352E-02
Ag-108M	#B	-1.1495E-02	-1.1495E-02	2.3263E-02	2.3273E-02	2.568E-02
CD-109	#A	1.7529E+00	1.7548E+00	1.8902E+00	1.8928E+00	2.049E+00
SN-113	#B	-2.6066E-04	-2.6177E-04	4.8144E-02	4.8144E-02	5.451E-02
SB-125	#F	1.3900E-01	1.3906E-01	7.8726E-02	7.9139E-02	1.117E-01
I-131	#B	2.9099E-03	3.0915E-03	3.8549E-02	3.8549E-02	4.107E-02
CS-134	#F	3.5926E-02	3.5949E-02	2.2461E-02	2.2558E-02	2.600E-02
CS-137	#A	1.4405E-02	1.4406E-02	3.7383E-02	3.7393E-02	4.179E-02
CE-139	#A	-1.0269E-02	-1.0305E-02	4.8762E-02	4.8766E-02	5.395E-02
EU-152	#B	-5.8667E-02	-5.8674E-02	1.6242E-01	1.6246E-01	1.733E-01
EU-154	#B	-4.2743E-02	-4.2750E-02	1.1633E-01	1.1636E-01	1.284E-01
EU-155	#B	1.8818E-01	1.8823E-01	2.4034E-01	2.4057E-01	2.620E-01
HG-203	#B	1.5287E-02	1.5447E-02	3.5726E-02	3.5737E-02	3.906E-02
TL-208	#	3.9016E-01	3.9016E-01	7.1902E-02	7.5385E-02	
PB-212		1.2458E+00	1.2458E+00	1.0502E-01	1.2752E-01	
PB-214		6.1432E-01	6.1432E-01	1.4091E-01	1.4536E-01	
BI-212		1.0342E+00	1.0342E+00	4.2380E-01	4.2803E-01	
BI-214		5.8649E-01	5.8649E-01	1.2582E-01	1.3034E-01	
RA-224	A	1.2825E+00	1.2825E+00	1.3006E+00	1.3027E+00	
RA-226	#	2.1028E+00	2.1028E+00	1.1885E+00	1.1948E+00	1.255E+00
AC-228		1.2612E+00	1.2612E+00	1.8097E-01	1.9522E-01	
TH-227	#B	-1.5415E-01	-1.5415E-01	3.8782E-01	3.8792E-01	4.280E-01
PA-234	#B	1.2014E-01	1.2014E-01	1.1157E-01	1.1177E-01	2.587E-01
TH-234	#B	2.1052E+00	2.1052E+00	6.3741E+00	6.3751E+00	7.064E+00
AM-241	#A	-1.3082E-01	-1.3082E-01	1.1339E+00	1.1339E+00	1.231E+00

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.

< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (1120.0 to 2000.7 keV) 2.5456913E+01 pCi/gm
Total Decayed Activity (1120.0 to 2000.7 keV) 2.5456957E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JPK

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 107_21AUG2006_1345.An1

Sample description
OOL-05-04-084-F-S WET

Spectrum Filename: C:\GammaVision\Spectra\107_21AUG2006_1345.An1

Acquisition information
Start time: 21-Aug-2006 13:45:03
Live time: 2000
Real time: 2003
Dead time: 0.14 %
Detector ID: 2

Detector system
Det 107- DSPE- 634

Calibration
Filename: D7_1LSa.Clb
Detector 107 Calibration for 1 Liter Sand Marinelli

Energy Calibration
Created: 29-Oct-2004 06:48:53
Zero offset: 0.157 keV
Gain: 0.500 keV/channel
Quadratic: -1.676E-08 keV/channel^2

Efficiency Calibration
Created: 29-Oct-2004 06:51:32
Type: Polynomial
Uncertainty: 1.174 %
Coefficients: -0.279532 -4.778179 0.614896
-0.087174 0.005356 -0.000131

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.16keV)
Stop channel: 4000 (2000.15keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 1.9990E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.9990E+03) =
5.0025E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	19-Aug-2006 07:25:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	107_150K_28APR05.Pbc 01-May-2005 05:30:33
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 17 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.1010

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
74.98	162.	31.42	1.50	2.849E-02	74.81	9.600	PBC<MDA	PB212
77.01	326.	15.38	1.50	2.957E-02				
77.01	326.	15.38	1.50	2.957E-02	77.11	10.700	6.961E-01	PB214
					77.11	17.500	4.256E-01	PB212
77.01	331.	15.38	1.50	2.957E-02				
77.01	331.	15.38	1.50	2.957E-02	77.11	10.700	6.961E-01	PB214
					77.11	17.500	4.318E-01	PB212
87.12	103.	29.83	1.19	3.302E-02	86.45	32.740	6.466E-02	EU155
					88.04	3.790	PBC<MDA	CD109
89.68	80.	37.66	1.19	3.367E-02				
93.13	160.	19.57	1.19	3.445E-02	92.38	2.570	1.167E+00	TH234
					92.80	3.000	PBC<MDA	TH234
128.31	102.	32.48	0.74	3.816E-02				
186.20	154.	25.91	1.33	3.609E-02	185.99	3.280	8.815E-01	RA226
209.77	91.	37.39	1.13	3.425E-02				
238.71	786.	4.36	1.30	3.189E-02	238.63	43.100	3.786E-01	PB212
					241.92	7.470	2.243E+00	PB214
242.27	102.	22.94	1.30	3.161E-02				
295.36	204.	10.87	1.34	2.767E-02	295.22	19.200	2.533E-01	PB214
300.04	53.	32.84	1.34	2.735E-02				
338.48	177.	16.60	1.50	2.500E-02	338.40	12.010	3.921E-01	AC228
351.97	384.	6.53	1.42	2.426E-02				
351.97	384.	6.53	1.42	2.426E-02	351.99	37.100	2.849E-01	PB214
463.38	35.	40.78	1.50	1.953E-02				
463.38	35.	40.78	1.50	1.953E-02	463.51	10.000	PBC<MDA	SB125
510.83	110.	18.54	1.22	1.808E-02	510.72	22.500	1.272E-01	TL208
583.25	305.	8.51	1.59	1.629E-02	583.14	86.000	1.450E-01	TL208

609.09	288.	8.61	1.44	1.575E-02	609.32	46.090	2.643E-01	BI214
727.06	78.	26.95	1.01	1.374E-02	727.17	11.800	3.177E-01	BI212
794.84	31.	40.14	1.68	1.284E-02	795.76	85.400	PBC<MDA	CS134
911.13	201.	12.01	1.55	1.161E-02	911.07	29.000	3.955E-01	AC228
968.01	184.	11.65	2.05	1.110E-02	968.90	17.460	6.351E-01	AC228
1120.79	108.	16.94	1.72	9.966E-03	1120.28	15.040	4.811E-01	BI214
1281.96	35.	38.73	0.97	9.028E-03				
1460.60	1295.	2.86	1.99	8.192E-03	1460.75	10.700	9.951E+00	K40
1764.13	60.	13.55	1.96	7.084E-03	1764.51	15.920	3.591E-01	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
173.90	87.11	418.	103.	0.051	89.48	1.187	BI-207	D
179.02	89.67	416.	80.	0.040	112.98	1.189	PB-214	D
185.92	93.12	411.	160.	0.080	58.72	1.191	U-235	D
419.19	209.77	406.	91.	0.045	112.16	1.131	NP-239	
477.05	238.65	193.	786.	0.393	13.08	1.297	PB-212	D
484.18	242.22	222.	102.	0.051	68.81	1.300	PB-214	D
599.67	300.03	142.	44.	0.022	123.48	1.557	PB-212	
2563.50	1281.96	43.	35.	0.017	116.20	0.966	BI-214	s

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-212	149.63	74.98	1273.	162.	0.081	94.27	1.500s
PB-214	153.89	77.11	1132.	326.	0.163	46.14	1.500D
PB-212	153.89	77.11	1128.	331.	0.165	46.14	1.500D
TH-234	185.86	93.10	947.	151.	0.075	85.24	1.500
TH-234	185.85	93.09	947.	135.	0.067	87.08	1.500
RA-226	372.04	186.20	517.	154.	0.077	77.74	1.330
PB-212	477.05	238.71	566.	717.	0.358	17.54	1.500s
PB-214	477.07	238.72	444.	648.	0.324	18.09	1.500
PB-214	590.28	295.33	282.	205.	0.102	39.60	1.500s
AC-228	676.58	338.48	226.	174.	0.087	49.81	1.497
PB-214	703.54	351.96	137.	394.	0.197	19.38	1.500
TL-208	1021.25	510.83	143.	77.	0.038	55.63	1.218s
TL-208	1166.07	583.25	104.	301.	0.150	25.54	1.592s
BI-214	1217.77	609.09	100.	284.	0.142	25.82	1.437
BI-212	1453.70	727.06	104.	76.	0.038	80.85	1.011s
CS-134	1589.25	794.84	67.	31.	0.016	120.41	1.684s
AC-228	1821.83	911.13	105.	197.	0.098	36.04	1.553
AC-228	1935.58	968.01	75.	182.	0.091	34.96	2.048s
BI-214	2241.16	1120.79	63.	107.	0.053	50.82	1.717s
K-40	2920.80	1460.60	24.	1290.	0.645	8.59	1.988
BI-214	3527.91	1764.13	3.	60.	0.030	40.64	1.956

s - Peak fails shape tests.
D - Peak area deconvoluted.

A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	Peak MDA Value pCi/gm	COMMENTS
BE-7		3.8947E-02					
			477.56	3.895E-02	&(	1.956E-01 5.76E-02	G
K-40		9.9506E+00					
			1460.75	9.951E+00	(P	1.967E-01 2.86E-01	G
MN-54		4.5682E-03					
			834.81	4.568E-03	&(P	2.544E-02 7.43E-03	G
CO-57		8.8670E-04					
			122.07	8.867E-04	&(P	2.698E-02 8.03E-03	G K
			136.43	-9.599E-04	% P	2.238E-01 6.66E-02	G
CO-60		3.4969E-03					
			1332.51	3.497E-03	%(P	2.342E-02 6.51E-03	G K
			1173.23	9.454E-03	% P	3.036E-02 8.90E-03	G K
Sr-85		-9.9654E-03					
			514.00	-9.965E-03	%(	2.665E-02 8.01E-03	G
Kr-85		-2.5071E+02					
			513.99	-2.507E+02	%(P	6.049E+02 1.81E+02	G
Y-88		1.5731E-03					
			1836.01	1.573E-03	&(P	1.406E-02 3.55E-03	G K
			898.02	-5.499E-03	% P	2.688E-02 7.75E-03	G
NB-94		2.8326E-03					
			871.10	2.833E-03	&(P	2.059E-02 5.92E-03	G K
			702.50	5.622E-03	% P	2.148E-02 6.33E-03	G K
Ag-108M		-2.8817E-03					
			722.95	-2.882E-03	&(	2.547E-02 7.39E-03	G K
			614.37	-1.162E-02	&	2.330E-02 7.08E-03	G
			433.93	-6.151E-04	& P	2.473E-02 7.17E-03	G
CD-109		2.7673E-03					
			88.04	2.767E-03	%(P	8.065E-01 2.40E-01	G
SN-113		-6.9265E-04					
			391.71	-6.926E-04	&(P	2.818E-02 8.11E-03	G K
			255.04	-3.255E-01	%	9.703E-01 2.92E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	1.4542E-02						
		427.95	1.454E-02	&(P	5.842E-02	1.72E-02	G K
		600.77	-3.454E-02	% P	1.062E-01	3.13E-02	G
		636.15	2.022E-02	% P	1.769E-01	5.11E-02	G
		463.51	1.223E-01	% P	1.745E-01	5.39E-02	G
		176.29	-1.888E-03	& P	3.110E-01	9.19E-02	G
I-131	6.7566E-03						
		364.48	6.757E-03	&(	2.386E-02	7.10E-03	G K
		636.97	1.515E-02	%	3.191E-01	9.13E-02	G
		284.29	-6.479E-02	%	3.693E-01	1.10E-01	G
CS-134	1.2331E-02						
		604.66	6.132E-03	%(P	1.421E-02	4.27E-03	G K
		795.76	1.942E-02	*(P	2.521E-02	7.92E-03	G
		569.29	-6.047E-04	&	1.265E-01	3.62E-02	G
		801.84	4.331E-02	& P	2.158E-01	6.25E-02	G
CS-137	8.9460E-03						
		661.62	8.946E-03	%(P	2.339E-02	6.93E-03	G
CE-139	-8.3726E-03						
		165.85	-8.373E-03	%(P	2.555E-02	7.69E-03	G
EU-152	2.4692E-02						
		121.78	2.469E-02	&(P	7.218E-02	2.18E-02	G K
		344.30	1.149E-03	% P	6.405E-02	1.86E-02	G
		1408.08	-3.449E-03	% P	8.794E-02	2.32E-02	G
		964.00	-2.308E-02	& P	3.053E-01	8.97E-02	G
		1112.07	5.464E-02	& P	1.874E-01	5.52E-02	G
		778.90	9.788E-03	% P	1.681E-01	4.81E-02	G
EU-154	5.0038E-03						
		123.10	5.004E-03	&(P	5.783E-02	1.72E-02	G K
		1274.80	2.004E-02	% P	7.245E-02	2.12E-02	G
		723.30	3.739E-02	& P	9.073E-02	2.72E-02	G
		1004.80	6.073E-02	% P	1.194E-01	3.64E-02	G
EU-155	5.6368E-02						
		86.45	5.637E-02	%(	9.459E-02	2.88E-02	G K
		105.31	1.567E-03	% P	1.134E-01	3.37E-02	G
HG-203	-4.4277E-03						
		279.17	-4.428E-03	%(P	2.476E-02	7.33E-03	G K
		72.87	-3.736E-01	& P	7.392E-01	2.24E-01	G
		70.83	-5.065E-01	%	1.264E+00	3.82E-01	G
		82.50	-3.160E-01	%	1.543E+00	4.63E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	1.4133E-01						
		583.14	1.450E-01	@(P	2.429E-02	1.25E-02	G
		510.72	1.272E-01	*(P	9.725E-02	3.40E-02	G
PB-212	3.6095E-01						
		238.63	3.524E-01	@(P	5.585E-02	2.11E-02	G K
							Energy duplication
		77.11	4.318E-01	+	2.079E-01	6.64E-02	G
		74.81	3.994E-01	*(P	4.175E-01	1.28E-01	G
PB-214	2.8375E-01						
		351.99	2.956E-01	(P	4.307E-02	1.93E-02	G K
		295.22	2.608E-01	(P	1.030E-01	3.52E-02	G
							Energy duplication
		77.11	6.961E-01	+ P	3.408E-01	1.09E-01	G
		241.92	1.855E+00	+ P	2.887E-01	1.12E-01	G
BI-212	3.1771E-01						
		727.17	3.177E-01	(P	2.092E-01	8.71E-02	G K
		1620.56	1.367E-01	& P	6.473E-01	1.81E-01	G
		785.42	2.426E-01	% P	1.029E+00	3.00E-01	G
BI-214	2.6430E-01						
		609.32	2.643E-01	(P	4.602E-02	2.31E-02	G K
		1764.51	3.591E-01	+ P	6.540E-02	4.94E-02	G
		1120.28	4.811E-01	+ P	1.793E-01	8.22E-02	G
RA-224	-3.9137E-03						
		241.00	-3.914E-03	%(P	5.949E-01	1.76E-01	G
RA-226	8.8146E-01						
		185.99	8.815E-01	(	6.201E-01	2.29E-01	G
AC-228	3.9454E-01						
		911.07	3.955E-01	(P	1.013E-01	4.85E-02	G K
		968.90	6.351E-01	+ P	1.504E-01	7.49E-02	G
		338.40	3.921E-01	(P	1.637E-01	6.63E-02	G
TH-227	-1.0989E-01						
		236.00	-1.099E-01	&(P	2.064E-01	6.27E-02	G K
		256.25	-8.953E-02	% P	2.700E-01	8.06E-02	G
PA-234	8.9917E-03						
		98.44	8.992E-03	&(	9.134E-02	2.72E-02	G K
		946.00	3.426E-02	&	1.034E-01	3.07E-02	G
		131.28	-3.688E-02	&	1.211E-01	3.65E-02	G
		94.67	6.677E-03	%	1.753E-01	5.23E-02	G
		883.24	-6.347E-03	%	1.539E-01	4.31E-02	G
		926.70	7.007E-02	%	1.763E-01	5.28E-02	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26 2.983E-04 &   1.883E-01 5.39E-02 G

TH-234       7.4306E-01
                           63.29 3.628E-01 %(P 1.180E+00 3.54E-01 G K
                           92.80 8.827E-01  (P 9.576E-01 2.94E-01 G
                           92.38 1.157E+00  (P 1.121E+00 3.46E-01 G

AM-241      -2.5598E-02
                           59.54-2.560E-02 %(P 1.630E-01 4.88E-02 G
   ( - This peak used in the nuclide activity average.

   * - Peak is too wide, but only one peak in library.
   ! - Peak is part of a multiplet and this area went
       negative during deconvolution.
   ? - Peak is too narrow.
   @ - Peak is too wide at FW25M, but ok at FWHM.
   % - Peak fails sensitivity test.
   $ - Peak identified, but first peak of this nuclide
       failed one or more qualification tests.
   + - Peak activity higher than counting uncertainty range.
   - - Peak activity lower than counting uncertainty range.
   = - Peak outside analysis energy range.
   & - Calculated peak centroid is not close enough to the
       library energy centroid for positive identification.
   P - Peakbackground subtraction
   } - Peak is too close to another for the activity
       to be found directly.

   Nuclide Codes:                      Peak Codes:
   T - Thermal Neutron Activation      G - Gamma Ray
   F - Fast Neutron Activation         X - X-Ray
   I - Fission Product                 P - Positron Decay
   N - Naturally Occurring Isotope     S - Single-Escape
   P - Photon Reaction                 D - Double-Escape
   C - Charged Particle Reaction       K - Key Line
   M - No MDA Calculation              A - Not in Average
   R - Coincidence Corrected           C - Coincidence Peak
   H - Halflife limit exceeded

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
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***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	3.7819E-02	3.8947E-02	1.7294E-01	1.7295E-01	1.899E-01
K-40		9.9506E+00	9.9506E+00	8.5818E-01	1.0401E+00	
MN-54	#A	4.5453E-03	4.5682E-03	2.2295E-02	2.2297E-02	2.531E-02
CO-57	#B	8.8156E-04	8.8670E-04	2.4077E-02	2.4077E-02	2.682E-02
CO-60	#B	3.4941E-03	3.4969E-03	1.9523E-02	1.9524E-02	2.340E-02

Sr-85	#A	-9.7271E-03	-9.9654E-03	2.4043E-02	2.4050E-02	2.601E-02
Kr-85	#A	-2.5070E+02	-2.5071E+02	6.6794E+02	6.6810E+02	6.049E+02
Y-88	#B	1.5501E-03	1.5731E-03	1.0646E-02	1.0647E-02	1.386E-02
NB-94	#B	2.8326E-03	2.8326E-03	1.7751E-02	1.7752E-02	2.059E-02
Ag-108M	#B	-2.8816E-03	-2.8817E-03	2.2168E-02	2.2169E-02	2.546E-02
CD-109	#A	2.7577E-03	2.7673E-03	7.2106E-01	7.2106E-01	8.037E-01
SN-113	#B	-6.8327E-04	-6.9265E-04	2.1684E-01	2.1684E-01	2.780E-02
SB-125	#B	1.4519E-02	1.4542E-02	5.1730E-02	5.1737E-02	5.833E-02
I-131	#B	5.5586E-03	6.7566E-03	2.1290E-02	2.1294E-02	1.963E-02
CS-134	#B	1.2306E-02	1.2331E-02	1.4919E-02	1.4937E-02	1.418E-02
CS-137	#A	8.9448E-03	8.9460E-03	2.0799E-02	2.0806E-02	2.338E-02
CE-139	#A	-8.2776E-03	-8.3726E-03	2.3494E-02	2.3499E-02	2.526E-02
EU-152	#B	2.4683E-02	2.4692E-02	6.5257E-02	6.5272E-02	7.216E-02
EU-154	#B	5.0013E-03	5.0038E-03	5.1747E-02	5.1748E-02	5.780E-02
EU-155	#B	5.6319E-02	5.6368E-02	8.6432E-02	8.6489E-02	9.451E-02
HG-203	#B	-4.2811E-03	-4.4277E-03	2.6204E-02	2.6205E-02	2.394E-02
TL-208	#	1.4133E-01	1.4133E-01	3.6644E-02	3.7583E-02	
PB-212	#	3.6095E-01	3.6095E-01	6.4692E-02	6.8114E-02	5.585E-02
PB-214	#	2.8375E-01	2.8375E-01	5.5706E-02	5.8173E-02	4.307E-02
BI-212		3.1771E-01	3.1771E-01	2.6121E-01	2.6188E-01	
BI-214		2.6430E-01	2.6430E-01	6.9285E-02	7.1021E-02	
RA-224	#A	-3.9137E-03	-3.9137E-03	1.0253E+00	1.0253E+00	5.949E-01
RA-226		8.8146E-01	8.8146E-01	6.8526E-01	6.8724E-01	
AC-228		3.9454E-01	3.9454E-01	1.2365E-01	1.2582E-01	
TH-227	#B	-1.0989E-01	-1.0989E-01	1.8998E-01	1.9010E-01	2.064E-01
PA-234	#B	8.9917E-03	8.9917E-03	8.1662E-02	8.1664E-02	9.134E-02
TH-234	#B	7.4306E-01	7.4306E-01	6.6686E-01	6.6813E-01	1.180E+00
AM-241	#A	-2.5598E-02	-2.5598E-02	1.5510E-01	1.5510E-01	1.630E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (277.2 to 2000.1 keV) 1.1949970E+01 pCi/gm
Total Decayed Activity (277.2 to 2000.1 keV) 1.1949972E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JPK

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 107F_22AUG2006_1026.An1

Sample description
FSS-OOL-05-04-071-F

Spectrum Filename: C:\GammaVision\Spectra\107F_22AUG2006_1026.An1

Acquisition information
Start time: 22-Aug-2006 10:27:19
Live time: 2000
Real time: 2003
Dead time: 0.15 %
Detector ID: 2

Detector system
Det 107- DSPE- 634

Calibration
Filename: D7_1LSa.Clb
Detector 107 Calibration for 1 Liter Sand Marinelli

Energy Calibration
Created: 29-Oct-2004 06:48:53
Zero offset: 0.157 keV
Gain: 0.500 keV/channel
Quadratic: -1.676E-08 keV/channel^2

Efficiency Calibration
Created: 29-Oct-2004 06:51:32
Type: Polynomial
Uncertainty: 1.174 %
Coefficients: -0.279532 -4.778179 0.614896
-0.087174 0.005356 -0.000131

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.16keV)
Stop channel: 4000 (2000.15keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 1.8860E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.8860E+03) =
5.3022E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	19-Aug-2006 10:15:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	107_150K_28APR05.Pbc 01-May-2005 05:30:33
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 20 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.1551

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
74.78	422.	11.24	1.18	2.849E-02	74.81	9.600	1.105E+00	PB212
77.08	468.	8.58	1.18	2.957E-02	77.11	17.500	8.983E-01	PB212
					77.11	10.700	1.458E+00	PB214
77.43	145.	39.59	1.50	2.957E-02	77.11	17.500	PBC<MDA	PB212
					77.11	10.700	PBC<MDA	PB214
87.24	206.	20.80	1.19	3.308E-02	86.45	32.740	1.376E-01	EU155
					88.04	3.790	1.175E+00	CD109
89.96	173.	24.29	1.19	3.377E-02				
93.08	269.	15.55	1.19	3.447E-02	92.38	2.570	2.124E+00	TH234
					92.80	3.000	1.733E+00	TH234
129.09	140.	39.95	1.81	3.818E-02				
129.09	140.	39.95	1.81	3.818E-02	131.28	20.000	1.308E-01	PA234
186.21	228.	20.43	1.39	3.609E-02	185.99	3.280	1.380E+00	RA226
209.35	140.	27.81	1.52	3.428E-02				
238.78	1658.	3.11	1.30	3.188E-02	238.63	43.100	8.562E-01	PB212
					241.00	3.900	9.597E+00	RA224
241.70	250.	15.27	1.30	3.165E-02	241.92	7.470	7.531E-01	PB214
270.76	150.	22.06	1.36	2.941E-02				
277.48	100.	34.89	1.56	2.892E-02				
295.39	345.	8.64	1.34	2.768E-02	295.22	19.200	4.591E-01	PB214
300.77	86.	25.82	1.34	2.732E-02				
327.73	79.	29.83	1.36	2.562E-02				
339.21	460.	9.03	1.60	2.496E-02	338.40	12.010	1.090E+00	AC228
352.04	625.	6.70	1.37	2.426E-02	351.99	37.100	4.935E-01	PB214
463.17	138.	14.83	1.83	1.954E-02				
463.17	138.	14.83	1.83	1.954E-02	463.51	10.000	4.963E-01	SB125
511.13	285.	13.63	2.00	1.807E-02	510.72	22.500	4.423E-01	TL208

583.26	576.	5.69	1.90	1.629E-02	583.14	86.000	2.923E-01	TL208
609.44	482.	6.06	1.67	1.574E-02	609.32	46.090	4.720E-01	BI214
661.78	194.	18.30	1.21	1.477E-02	661.62	84.620	1.090E-01	CS137
727.21	220.	15.30	1.88	1.374E-02	727.17	11.800	9.664E-01	BI212
772.93	37.	37.52	1.67	1.312E-02				
785.02	56.	31.03	1.24	1.297E-02	785.42	2.000	1.518E+00	BI212
795.21	86.	24.21	1.27	1.285E-02				
795.21	86.	24.21	1.27	1.285E-02	795.76	85.400	5.614E-02	CS134
861.05	85.	20.56	1.19	1.210E-02				
911.46	457.	6.55	1.92	1.160E-02	911.07	29.000	9.641E-01	AC228
934.09	49.	36.45	1.32	1.140E-02				

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
968.20	411.	7.22	1.77	1.110E-02	968.90	17.460	1.513E+00	AC228
1120.69	159.	15.37	2.14	9.967E-03	1120.28	15.040	7.565E-01	BI214
1332.76	22.	39.07	2.03	8.773E-03	1332.51	99.980	PBC<MDA	CO60
1378.15	47.	27.81	1.87	8.556E-03				
1461.10	1874.	2.36	2.33	8.189E-03	1460.75	10.700	1.528E+01	K40
1765.00	95.	12.51	2.67	7.084E-03	1764.51	15.920	6.011E-01	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
174.14	87.34	817.	206.	0.103	62.41	1.187	PB-214	D
179.58	90.06	797.	173.	0.087	72.88	1.189	PB-214	D
185.83	93.19	742.	269.	0.135	46.64	1.191	U-235	D
257.84	129.09	1130.	152.	0.076	97.10	1.811	AC-228	s
418.34	209.35	598.	140.	0.070	83.42	1.521	AC-228	s
541.15	270.76	395.	150.	0.075	66.18	1.363	AC-228	s
554.58	277.48	444.	103.	0.051	92.12	1.558	TL-208	
600.77	300.57	294.	88.	0.044	94.01	1.621	PB-212	sM
655.07	327.73	265.	113.	0.056	71.50	1.340	AC-228	s
1545.43	773.23	77.	37.	0.018	112.56	1.669	W-187	D
1569.60	785.02	92.	56.	0.028	93.08	1.243	BI-212	l
1721.66	861.05	76.	85.	0.043	61.68	1.191	TL-208	s
1867.74	934.09	90.	49.	0.024	92.91	1.325	BI-214	s
2755.88	1378.15	32.	47.	0.024	83.42	1.866	BI-214	s

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.
M - Peak is close to a library peak.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
HG-203	145.39	72.86	2900.	-194.	-0.097	120.86	1.500s
PB-212	149.29	74.81	934.	422.	0.211	33.71	1.178D
PB-212	153.89	77.11	974.	468.	0.234	25.73	1.179A
PB-214	153.89	77.11	1688.	145.	0.072	118.78	1.500A
EU-155	174.28	87.31	1972.	174.	0.087	110.91	1.500
CD-109	174.36	87.35	1843.	160.	0.080	116.34	1.500
TH-234	185.57	92.95	1912.	211.	0.106	86.88	1.500s
TH-234	185.55	92.94	1828.	210.	0.105	80.88	1.500s
RA-226	372.06	186.21	777.	228.	0.114	61.30	1.386s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
TH-227	471.68	236.02	1535.	-155.	-0.078	109.95	1.500s
PB-212	476.89	238.63	445.	1631.	0.816	9.12	1.297D
RA-224	477.20	238.78	752.	1618.	0.809	10.34	1.500s
PB-214	483.47	241.92	621.	231.	0.115	49.57	1.299D
PB-214	591.10	295.74	730.	492.	0.246	34.80	1.612s
AC-228	678.03	339.21	375.	457.	0.228	27.09	1.595s
PB-214	703.69	352.04	357.	620.	0.310	20.09	1.368s
SB-125	926.22	463.31	177.	132.	0.066	49.00	1.500s
TL-208	1021.85	511.13	347.	251.	0.126	40.88	2.000s
TL-208	1166.10	583.26	171.	571.	0.286	17.07	1.904s
BI-214	1218.46	609.44	142.	478.	0.239	18.18	1.672
CS-137	1323.14	661.78	245.	190.	0.095	54.91	1.210s
BI-212	1453.99	727.21	204.	219.	0.109	45.91	1.875s
CS-134	1590.18	795.31	100.	59.	0.030	80.95	1.684s
AC-228	1822.48	911.46	123.	453.	0.226	19.65	1.917
AC-228	1935.97	968.20	117.	409.	0.205	21.66	1.775s
BI-214	2240.95	1120.69	120.	158.	0.079	46.11	2.145s
K-40	2921.81	1461.10	28.	1869.	0.934	7.08	2.325
BI-214	3529.65	1765.00	11.	95.	0.047	37.53	2.667s

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	Peak MDA Value pCi/gm	COMMENTS
BE-7		4.7265E-02					
			477.56	4.727E-02	%(	2.716E-01 8.04E-02 G	
K-40		1.5279E+01					
			1460.75	1.528E+01	(P	2.242E-01 3.62E-01 G	
MN-54		-2.4981E-04					
			834.81	-2.498E-04	%(P	3.813E-02 1.11E-02 G	
CO-57		7.7711E-03					
			122.07	7.771E-03	&(P	3.589E-02 1.08E-02 G K	
			136.43	7.728E-04	% P	3.032E-01 9.06E-02 G	
CO-60		1.8318E-02					
			1332.51	1.832E-02	%(P	2.718E-02 8.36E-03 G K	
			1173.23	1.744E-02	% P	4.204E-02 1.26E-02 G K	

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
Sr-85	-2.2467E-02						
		514.00	-2.247E-02	%(	3.946E-02	1.20E-02	G
Kr-85	-5.3041E+02						
		513.99	-5.304E+02	%(P	8.854E+02	2.69E+02	G
Y-88	-7.6280E-04						
		1836.01	-7.628E-04	%(P	2.423E-02	6.34E-03	G K
		898.02	3.110E-03	% P	3.596E-02	1.04E-02	G
NB-94	4.1819E-03						
		871.10	4.182E-03	%(P	2.194E-02	6.36E-03	G K
		702.50	9.399E-03	& P	2.933E-02	8.75E-03	G K
Ag-108M	-3.9818E-03						
		722.95	-3.982E-03	%(	3.501E-02	1.03E-02	G K
		614.37	-2.598E-02	&	3.875E-02	1.19E-02	G
		433.93	-6.520E-04	% P	2.860E-02	8.33E-03	G
CD-109	9.1114E-01						
		88.04	9.111E-01	(P	1.158E+00	3.54E-01	G
SN-113	-4.2070E-03						
		391.71	-4.207E-03	%(P	4.416E-02	1.30E-02	G K
		255.04	-1.489E-01	&	1.305E+00	3.89E-01	G
SB-125	1.2804E-01						
		427.95	7.582E-03	%(P	8.784E-02	2.58E-02	G K
		600.77	-1.016E-03	% P	1.222E-01	3.49E-02	G
		636.15	-2.517E-03	& P	2.230E-01	6.40E-02	G
		463.51	4.846E-01	(P	2.380E-01	8.08E-02	G
		176.29	3.299E-02	% P	4.190E-01	1.25E-01	G
I-131	1.6744E-03						
		364.48	1.674E-03	&(	3.229E-02	9.44E-03	G K
		636.97	1.848E-01	%	4.059E-01	1.23E-01	G
		284.29	-8.985E-02	%	5.699E-01	1.70E-01	G
CS-134	1.8206E-02						
		604.66	2.693E-04	%(P	6.595E-02	1.96E-02	G K
		795.76	3.870E-02	*(P	3.232E-02	1.05E-02	G
		569.29	5.202E-02	%	1.623E-01	4.85E-02	G
		801.84	1.979E-02	% P	3.433E-01	9.95E-02	G
CS-137	1.0898E-01						
		661.62	1.090E-01	@(P	4.337E-02	2.03E-02	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments

CE-139      -1.0389E-02
                          165.85-1.039E-02 %(P 3.602E-02 1.08E-02 G

EU-152       1.5564E-02
                          121.78 1.556E-02 &(P 1.087E-01 3.26E-02 G K
                          344.30-9.023E-03 % P 9.958E-02 2.95E-02 G
                         1408.08 4.114E-02 % P 1.122E-01 3.32E-02 G
                          964.00-1.067E-02 % P 3.483E-01 1.02E-01 G
                         1112.07-6.328E-02 % P 2.781E-01 8.19E-02 G
                          778.90-3.136E-03 % P 1.892E-01 5.38E-02 G

EU-154       2.4457E-04
                          123.10 2.446E-04 %(P 7.823E-02 2.34E-02 G K
                         1274.80-1.747E-02 & P 1.208E-01 3.53E-02 G
                          723.30-1.547E-03 % P 1.699E-01 4.93E-02 G
                         1004.80-3.578E-02 & P 1.857E-01 5.44E-02 G

EU-155       1.1580E-01
                           86.45 1.158E-01  (  1.399E-01 4.28E-02 G K
                          105.31 5.697E-02 % P 1.612E-01 4.87E-02 G

HG-203      -4.1981E-03
                          279.17-4.198E-03 &(P 3.344E-02 9.93E-03 G K
                           72.87-8.262E-01 + P 1.081E+00 3.30E-01 G
                           70.83 1.478E-01 %   1.237E+00 3.70E-01 G
                           82.50-4.110E-01 %   2.028E+00 6.10E-01 G

TL-208       2.9228E-01
                          583.14 2.923E-01 @(P 3.251E-02 1.68E-02 G
                          510.72 4.423E-01 + P 1.576E-01 6.84E-02 G

PB-212       8.6407E-01
                          238.63 8.502E-01  (P 5.264E-02 2.61E-02 G K
                                                         Energy duplication
                           77.11 6.478E-01 }   2.051E-01 5.56E-02 G
                           74.81 1.105E+00 + P 3.802E-01 1.25E-01 G

PB-214       4.9352E-01
                          351.99 4.935E-01 @(P 7.227E-02 3.33E-02 G K
                          295.22 6.641E-01 + P 1.734E-01 7.78E-02 G
                                                         Energy duplication
                           77.11 3.274E-01 } P 4.397E-01 1.30E-01 G
                          241.92 6.997E-01 + P 3.604E-01 1.16E-01 G

BI-212       9.6637E-01
                          727.17 9.664E-01 *(P 3.063E-01 1.49E-01 G K
                         1620.56 1.323E-01 & P 1.039E+00 2.94E-01 G
                          785.42 6.760E-01 % P 1.398E+00 4.23E-01 G
```

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
BI-214	4.7202E-01						
		609.32	4.720E-01	(P	5.752E-02	2.89E-02	G K
		1764.51	6.011E-01	+ P	1.172E-01	7.59E-02	G
		1120.28	7.565E-01	+ P	2.566E-01	1.17E-01	G
RA-224	9.3765E+00						
		241.00	9.376E+00	?(P	7.561E-01	3.24E-01	G
RA-226	1.3796E+00						
		185.99	1.380E+00	*(	8.024E-01	2.82E-01	G
AC-228	1.0010E+00						
		911.07	9.641E-01	(P	1.158E-01	6.38E-02	G K
		968.90	1.513E+00	+ P	1.965E-01	1.10E-01	G
		338.40	1.090E+00	*(P	2.219E-01	9.92E-02	G
TH-227	-3.0930E-01						
		236.00	-3.093E-01	?(P	3.692E-01	1.13E-01	G K
		256.25	-6.642E-02	& P	3.573E-01	1.06E-01	G
PA-234	-5.2102E-02						
		98.44	-5.210E-02	&(	1.409E-01	4.26E-02	G K
		946.00	-3.521E-02	%	1.726E-01	5.09E-02	G
		131.28	-1.233E-02	&	1.311E-01	3.91E-02	G
		94.67	-4.844E-02	%	2.683E-01	8.07E-02	G
		883.24	0.000E+00	%	2.766E-01	7.98E-02	G
		926.70	3.790E-02	&	2.929E-01	8.55E-02	G
		569.26	7.696E-02	%	2.401E-01	7.17E-02	G
TH-234	1.1114E+00						
		63.29	4.433E-01	%(P	1.698E+00	5.10E-01	G K
		92.80	1.461E+00	(P	1.403E+00	4.31E-01	G
		92.38	1.717E+00	(P	1.679E+00	5.16E-01	G
AM-241	3.5677E-03						
		59.54	3.568E-03	%(P	1.964E-01	5.86E-02	G

(- This peak used in the nuclide activity average.

* - Peak is too wide, but only one peak in library.
! - Peak is part of a multiplet and this area went negative during deconvolution.
? - Peak is too narrow.
@ - Peak is too wide at FW25M, but ok at FWHM.
% - Peak fails sensitivity test.
$ - Peak identified, but first peak of this nuclide failed one or more qualification tests.

+ - Peak activity higher than counting uncertainty range.
- - Peak activity lower than counting uncertainty range.
= - Peak outside analysis energy range.
& - Calculated peak centroid is not close enough to the library energy centroid for positive identification.
P - Peakbackground subtraction
} - Peak is too close to another for the activity to be found directly.

Nuclide Codes:
T - Thermal Neutron Activation
F - Fast Neutron Activation
I - Fission Product
N - Naturally Occurring Isotope
P - Photon Reaction
C - Charged Particle Reaction
M - No MDA Calculation
R - Coincidence Corrected
H - Halflife limit exceeded

Peak Codes:
G - Gamma Ray
X - X-Ray
P - Positron Decay
S - Single-Escape
D - Double-Escape
K - Key Line
A - Not in Average
C - Coincidence Peak

- -

***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	4.5455E-02	4.7265E-02	2.4132E-01	2.4134E-01	2.612E-01
K-40		1.5279E+01	1.5279E+01	1.0852E+00	1.4114E+00	
MN-54	#A	-2.4814E-04	-2.4981E-04	2.8514E-02	2.8514E-02	3.788E-02
CO-57	#B	7.7113E-03	7.7711E-03	3.2368E-02	3.2371E-02	3.562E-02
CO-60	#B	1.8298E-02	1.8318E-02	2.5077E-02	2.5100E-02	2.715E-02
Sr-85	#A	-2.1756E-02	-2.2467E-02	3.6083E-02	3.6108E-02	3.821E-02
Kr-85	#A	-5.3040E+02	-5.3041E+02	8.9565E+02	8.9620E+02	8.854E+02
Y-88	#B	-7.4803E-04	-7.6280E-04	2.8602E-01	2.8602E-01	2.376E-02
NB-94	#B	4.1819E-03	4.1819E-03	1.9087E-02	1.9089E-02	2.194E-02
Ag-108M	#B	-3.9816E-03	-3.9818E-03	3.0799E-02	3.0800E-02	3.501E-02
CD-109	#A	9.0695E-01	9.1114E-01	1.0621E+00	1.0633E+00	1.152E+00
SN-113	#B	-4.1315E-03	-4.2070E-03	6.1008E-02	6.1008E-02	4.337E-02
SB-125	#F	1.2778E-01	1.2804E-01	6.4073E-02	6.4518E-02	8.765E-02
I-131	#B	1.2919E-03	1.6744E-03	2.8329E-02	2.8329E-02	2.491E-02
CS-134	#B	1.8155E-02	1.8206E-02	1.4870E-02	1.4909E-02	6.577E-02
CS-137	#	1.0895E-01	1.0898E-01	6.0953E-02	6.1292E-02	
CE-139	#A	-1.0232E-02	-1.0389E-02	3.3057E-02	3.3063E-02	3.547E-02
EU-152	#B	1.5557E-02	1.5564E-02	9.7845E-02	9.7848E-02	1.087E-01
EU-154	#B	2.4440E-04	2.4457E-04	7.0073E-02	7.0073E-02	7.818E-02
EU-155	#A	1.1567E-01	1.1580E-01	1.2844E-01	1.2860E-01	1.397E-01
HG-203	#B	-4.0144E-03	-4.1981E-03	3.6308E-02	3.6309E-02	3.197E-02
TL-208	#	2.9228E-01	2.9228E-01	5.0284E-02	5.3165E-02	
PB-212		8.6407E-01	8.6407E-01	7.9542E-02	9.4506E-02	
PB-214		4.9352E-01	4.9352E-01	9.9955E-02	1.0412E-01	
BI-212	#	9.6637E-01	9.6637E-01	4.4628E-01	4.4991E-01	

BI-214	4.7202E-01	4.7202E-01	8.6583E-02	9.0961E-02

RA-224 #	9.3765E+00	9.3765E+00	9.7092E-01	1.1177E+00	7.561E-01
RA-226 #	1.3796E+00	1.3796E+00	8.4572E-01	8.4964E-01	
AC-228	1.0010E+00	1.0010E+00	1.6879E-01	1.7884E-01	
TH-227 #A	-3.0930E-01	-3.0930E-01	3.4066E-01	3.4115E-01	3.692E-01
PA-234 #B	-5.2102E-02	-5.2102E-02	1.2774E-01	1.2777E-01	1.409E-01
TH-234 #B	1.1114E+00	1.1114E+00	9.8319E-01	9.8512E-01	1.698E+00
AM-241 #A	3.5677E-03	3.5677E-03	1.7589E-01	1.7589E-01	1.964E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (785.2 to 2000.1 keV) 2.0856554E+01 pCi/gm
Total Decayed Activity (785.2 to 2000.1 keV) 2.0856577E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JPK

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 107F_22AUG2006_1112.An1

Sample description
FSS-OOL-05-04-083-F

Spectrum Filename: C:\GammaVision\Spectra\107F_22AUG2006_1112.An1

Acquisition information

Start time:	22-Aug-2006 11:12:58
Live time:	2000
Real time:	2002
Dead time:	0.12 %
Detector ID:	2

Detector system
Det 107- DSPE- 634

Calibration

Filename:	D7_1LSa.Clb

Detector 107 Calibration for 1 Liter Sand Marinelli

Energy Calibration

Created:	29-Oct-2004 06:48:53
Zero offset:	0.157 keV
Gain:	0.500 keV/channel
Quadratic:	-1.676E-08 keV/channel^2

Efficiency Calibration

Created:	29-Oct-2004 06:51:32
Type:	Polynomial
Uncertainty:	1.174 %
Coefficients:	-0.279532 -4.778179 0.614896
	-0.087174 0.005356 -0.000131

Library Files

Main analysis library:	FSS_Rev_1.Lib
Library Match Width:	1.000
Peak stripping:	Library based

Analysis parameters

Analysis engine:	Env32 G53W4.20
Start channel:	100 (50.16keV)
Stop channel:	4000 (2000.15keV)
Peak rejection level:	41.667%
Peak search sensitivity:	3
Sample Size:	1.8260E+03
Activity scaling factor:	1.0000E+06/(1.0000E+00* 1.8260E+03) = 5.4765E+02
Detection limit method:	Nureg 4.16
Random error:	1.0000000E+00
Systematic error:	1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	19-Aug-2006 13:30:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	107_150K_28APR05.Pbc 01-May-2005 05:30:33
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 20 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.2355

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
74.86	239.	25.22	1.50	2.849E-02	74.81	9.600	6.457E-01	PB212
77.09	467.	12.52	1.50	2.957E-02	77.11	17.500	6.684E-01	PB212
					77.11	10.700	1.082E+00	PB214
77.09	463.	12.52	1.50	2.957E-02	77.11	17.500	6.616E-01	PB212
					77.11	10.700	1.082E+00	PB214
86.88	191.	19.28	1.19	3.290E-02	86.45	32.740	1.316E-01	EU155
					88.04	3.790	1.124E+00	CD109
90.38	130.	26.59	1.19	3.379E-02				
93.34	161.	21.69	1.19	3.445E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
185.76	204.	21.44	1.23	3.612E-02	185.99	3.280	1.272E+00	RA226
209.94	115.	30.80	1.14	3.423E-02				
238.79	1187.	3.51	1.30	3.189E-02	238.63	43.100	6.305E-01	PB212
242.07	200.	16.51	1.30	3.162E-02	241.00	3.900	1.182E+00	RA224
					241.92	7.470	6.212E-01	PB214
270.23	136.	27.44	1.52	2.945E-02				
295.35	274.	9.39	1.34	2.768E-02				
295.35	274.	9.39	1.34	2.768E-02	295.22	19.200	3.758E-01	PB214
300.34	82.	25.95	1.34	2.734E-02				
328.00	71.	31.87	1.65	2.560E-02				
338.45	284.	13.76	1.66	2.500E-02	338.40	12.010	6.920E-01	AC228
351.91	525.	6.72	1.63	2.426E-02				
351.91	525.	6.72	1.63	2.426E-02	351.99	37.100	4.276E-01	PB214
463.94	73.	29.22	1.89	1.951E-02	463.51	10.000	2.662E-01	SB125
511.01	190.	15.01	1.58	1.807E-02	510.72	22.500	2.837E-01	TL208
583.37	425.	6.53	1.59	1.628E-02	583.14	86.000	2.220E-01	TL208
609.57	362.	6.69	1.78	1.574E-02	609.32	46.090	3.648E-01	BI214

661.81	274.	8.88	1.64	1.477E-02	661.62	84.620	1.604E-01	CS137
727.32	126.	22.10	1.51	1.374E-02	727.17	11.800	5.687E-01	BI212
785.08	49.	29.89	1.59	1.297E-02	785.42	2.000	1.411E+00	BI212
794.89	36.	36.17	1.68	1.284E-02	795.76	85.400	PBC<MDA	CS134
860.77	74.	25.58	1.06	1.211E-02				
911.41	341.	8.83	1.67	1.160E-02	911.07	29.000	7.395E-01	AC228
968.22	274.	9.28	1.09	1.110E-02	968.90	17.460	1.038E+00	AC228

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
1120.62	75.	19.82	2.33	9.968E-03	1120.28	15.040	3.678E-01	BI214
1461.16	1492.	2.68	2.30	8.189E-03	1460.75	10.700	1.256E+01	K40
1622.52	28.	20.59	0.79	7.569E-03	1620.56	2.750	1.010E+00	BI212
1764.88	84.	10.91	1.83	7.082E-03	1764.51	15.920	5.454E-01	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
179.33	90.17	534.	140.	0.070	74.54	1.189	PB-214	D
185.25	93.13	545.	147.	0.073	71.94	1.191	U-235	D
419.53	209.94	473.	115.	0.057	92.41	1.136	NP-239	s
477.20	238.72	276.	1187.	0.593	10.54	1.297	PB-212	D
483.77	242.00	444.	200.	0.100	49.54	1.299	PB-214	D
540.08	270.23	431.	136.	0.068	82.32	1.518	AC-228	s
600.00	300.19	184.	84.	0.042	75.93	1.504	PB-212	
655.62	328.00	191.	71.	0.035	95.60	1.653	AC-228	s
1721.10	860.77	83.	74.	0.037	62.32	1.063	TL-208	s

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-212	149.38	74.86	1753.	239.	0.119	75.65	1.500s
PB-212	153.89	77.11	1480.	467.	0.234	37.57	1.500D
PB-214	153.89	77.11	1485.	463.	0.231	37.57	1.500D
EU-155	173.95	87.14	1346.	188.	0.094	85.43	1.500
CD-109	175.74	88.04	634.	164.	0.082	69.04	1.187D
TH-234	186.12	93.23	1224.	137.	0.068	105.27	1.500
TH-234	186.06	93.20	1280.	125.	0.063	106.67	1.500
RA-226	371.15	185.76	654.	204.	0.102	64.31	1.229s
TH-227	472.00	236.18	1183.	-136.	-0.068	110.29	1.500s
PB-212	477.16	238.76	810.	1116.	0.558	13.83	1.500s
PB-214	590.27	295.32	361.	272.	0.136	34.13	1.500
AC-228	676.51	338.45	358.	281.	0.140	41.27	1.664s
PB-214	703.77	352.08	264.	472.	0.236	19.82	1.500s
SB-125	925.84	463.12	128.	61.	0.031	83.37	1.500s
TL-208	1021.61	511.01	216.	156.	0.078	45.03	1.576s
TL-208	1166.33	583.37	116.	420.	0.210	19.60	1.589

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
BI-214	1218.72	609.57	94.	358.	0.179	20.08	1.780
CS-137	1323.19	661.81	100.	271.	0.135	26.63	1.644s
BI-212	1454.22	727.32	159.	125.	0.062	66.30	1.514
BI-212	1569.73	785.08	68.	49.	0.025	89.68	1.591s
CS-134	1589.35	794.89	68.	36.	0.018	108.50	1.684s
AC-228	1822.38	911.41	127.	336.	0.168	26.48	1.666
AC-228	1935.99	968.22	95.	272.	0.136	27.83	1.087s
BI-214	2240.80	1120.62	62.	75.	0.037	59.45	2.325s
K-40	2921.92	1461.16	29.	1488.	0.744	8.05	2.296
BI-212	3244.67	1622.52	3.	28.	0.014	61.77	0.790s
BI-214	3529.41	1764.88	1.	83.	0.042	32.73	1.833

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	Peak MDA Value pCi/gm	COMMENTS
BE-7		1.1546E-02					
			477.56	1.155E-02	&(	2.336E-01 6.80E-02	G
K-40		1.2563E+01					
			1460.75	1.256E+01	(P	2.356E-01 3.38E-01	G
MN-54		-5.8518E-03					
			834.81	-5.852E-03	%(P	3.044E-02 8.92E-03	G
CO-57		9.5158E-03					
			122.07	9.516E-03	&(P	3.428E-02 1.03E-02	G K
			136.43	-6.372E-02	% P	2.596E-01 7.80E-02	G
CO-60		-1.7351E-03					
			1332.51	-1.735E-03	%(P	3.401E-02 9.41E-03	G K
			1173.23	4.467E-05	& P	3.665E-02 1.04E-02	G K
Sr-85		-1.1583E-02					
			514.00	-1.158E-02	%(	3.316E-02 9.96E-03	G
Kr-85		-2.8783E+02					
			513.99	-2.878E+02	%(P	7.462E+02 2.23E+02	G
Y-88		-1.1323E-03					
			1836.01	-1.132E-03	&(P	2.008E-02 5.01E-03	G K
			898.02	-7.303E-03	% P	3.441E-02 1.00E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
NB-94	6.2804E-03						
		871.10	6.280E-03	%(P	2.655E-02	7.80E-03	G K
		702.50	6.499E-03	% P	1.993E-02	5.90E-03	G K
Ag-108M	-1.5525E-02						
		722.95	-1.552E-02	&(	3.532E-02	1.07E-02	G K
		614.37	-1.541E-03	%	3.129E-02	9.11E-03	G
		433.93	-2.475E-04	& P	2.619E-02	7.60E-03	G
CD-109	9.6749E-01						
		88.04	9.675E-01	(P	7.078E-01	2.23E-01	G
SN-113	1.0149E-02						
		391.71	1.015E-02	%(P	3.477E-02	1.04E-02	G K
		255.04	-1.814E-01	&	1.208E+00	3.60E-01	G
SB-125	5.7294E-02						
		427.95	-1.689E-03	%(P	8.428E-02	2.45E-02	G K
		600.77	2.036E-02	& P	1.402E-01	4.10E-02	G
		636.15	-2.921E-03	& P	1.890E-01	5.36E-02	G
		463.51	2.319E-01	@(P	2.108E-01	6.74E-02	G
		176.29	3.913E-04	& P	4.269E-01	1.27E-01	G
I-131	3.3017E-03						
		364.48	3.302E-03	&(	3.667E-02	1.08E-02	G K
		636.97	1.915E-03	&	4.272E-01	1.23E-01	G
		284.29	-3.135E-03	%	5.084E-01	1.50E-01	G
CS-134	9.5958E-03						
		604.66	-3.145E-03	%(P	2.795E-02	8.16E-03	G K
		795.76	2.416E-02	@(P	2.788E-02	8.87E-03	G
		569.29	5.504E-02	%	1.357E-01	4.08E-02	G
		801.84	3.282E-02	% P	2.386E-01	6.85E-02	G
CS-137	1.6040E-01						
		661.62	1.604E-01	*(P	2.922E-02	1.44E-02	G
CE-139	7.5400E-03						
		165.85	7.540E-03	%(P	3.256E-02	9.77E-03	G
EU-152	2.4528E-02						
		121.78	2.453E-02	%(P	1.001E-01	3.01E-02	G K
		344.30	-6.743E-05	% P	8.507E-02	2.49E-02	G
		1408.08	6.597E-02	% P	9.644E-02	3.05E-02	G
		964.00	-1.762E-02	% P	2.821E-01	8.23E-02	G
		1112.07	3.006E-02	& P	2.538E-01	7.36E-02	G
		778.90	1.481E-02	% P	1.897E-01	5.45E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
EU-154	1.9050E-02						
		123.10	1.905E-02	%(P	6.823E-02	2.05E-02	G K
		1274.80	-2.216E-02	% P	1.034E-01	3.03E-02	G
		723.30	-1.206E-03	& P	2.616E-01	7.71E-02	G
		1004.80	-5.834E-03	% P	1.739E-01	4.97E-02	G
EU-155	1.2989E-01						
		86.45	1.299E-01	(	1.197E-01	3.70E-02	G K
		105.31	4.156E-02	% P	1.471E-01	4.43E-02	G
HG-203	-5.5854E-03						
		279.17	-5.585E-03	%(P	2.947E-02	8.75E-03	G K
		72.87	-1.266E-01	% P	9.315E-01	2.80E-01	G
		70.83	-2.675E-01	&	1.602E+00	4.82E-01	G
		82.50	-5.230E-01	%	1.901E+00	5.73E-01	G
TL-208	2.2195E-01						
		583.14	2.220E-01	(P	2.793E-02	1.47E-02	G
		510.72	2.837E-01	+ P	1.295E-01	5.18E-02	G
PB-212	6.2385E-01						
		238.63	6.009E-01	@(P	7.287E-02	2.81E-02	G K
							Energy duplication
		77.11	6.684E-01	*(	2.602E-01	8.37E-02	G
		74.81	6.457E-01	*(P	5.351E-01	1.65E-01	G
PB-214	3.8501E-01						
		351.99	3.882E-01	@(P	6.444E-02	2.59E-02	G K
		295.22	3.789E-01	(P	1.271E-01	4.38E-02	G
							Energy duplication
		77.11	1.082E+00	+ P	4.263E-01	1.37E-01	G
		241.92	1.928E-01	% P	4.859E-01	1.47E-01	G
BI-212	6.5204E-01						
		727.17	5.687E-01	(P	2.809E-01	1.27E-01	G K
		1620.56	1.010E+00	*(P	3.636E-01	2.12E-01	G
		785.42	1.411E+00	+ P	1.170E+00	4.32E-01	G
BI-214	3.6555E-01						
		609.32	3.648E-01	(P	4.893E-02	2.47E-02	G K
		1764.51	5.454E-01	+ P	4.837E-02	6.02E-02	G
		1120.28	3.678E-01	(P	1.952E-01	7.38E-02	G
RA-224	6.3288E-01						
		241.00	6.329E-01	%(P	8.857E-01	2.71E-01	G
RA-226	1.2725E+00						
		185.99	1.272E+00	*(	7.620E-01	2.73E-01	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments

AC-228       7.2557E-01
                          911.07 7.395E-01  (P 1.212E-01 6.61E-02 G K
                          968.90 1.038E+00 + P 1.841E-01 9.71E-02 G
                          338.40 6.920E-01  (P 2.240E-01 9.63E-02 G

TH-227      -2.8052E-01
                          236.00-2.805E-01 ?(P 3.354E-01 1.03E-01 G K
                          256.25-1.599E-02 % P 3.040E-01 8.92E-02 G

PA-234       1.0007E-03
                           98.44 1.001E-03 %(  1.163E-01 3.46E-02 G K
                          946.00-3.197E-02 &   1.622E-01 4.76E-02 G
                          131.28 7.752E-04 &   1.405E-01 4.19E-02 G
                           94.67-8.234E-02 %   2.335E-01 7.05E-02 G
                          883.24-2.132E-02 &   2.002E-01 5.74E-02 G
                          926.70-1.082E-03 %   2.571E-01 7.32E-02 G
                          569.26 8.029E-02 %   2.012E-01 6.05E-02 G

TH-234       7.6755E-01
                           63.29 4.149E-01 %(P 1.534E+00 4.61E-01 G K
                           92.80 9.001E-01  (P 1.215E+00 3.70E-01 G
                           92.38 1.148E+00  (P 1.392E+00 4.26E-01 G

AM-241      -2.7593E-03
                           59.54-2.759E-03 &(P 1.985E-01 5.92E-02 G
   ( - This peak used in the nuclide activity average.

   * - Peak is too wide, but only one peak in library.
   ! - Peak is part of a multiplet and this area went
       negative during deconvolution.
   ? - Peak is too narrow.
   @ - Peak is too wide at FW25M, but ok at FWHM.
   % - Peak fails sensitivity test.
   $ - Peak identified, but first peak of this nuclide
       failed one or more qualification tests.
   + - Peak activity higher than counting uncertainty range.
   - - Peak activity lower than counting uncertainty range.
   = - Peak outside analysis energy range.
   & - Calculated peak centroid is not close enough to the
       library energy centroid for positive identification.
   P - Peakbackground subtraction
   } - Peak is too close to another for the activity
       to be found directly.

   Nuclide Codes:                      Peak Codes:
   T - Thermal Neutron Activation      G - Gamma Ray
   F - Fast Neutron Activation         X - X-Ray
```

I - Fission Product
N - Naturally Occurring Isotope
P - Photon Reaction
C - Charged Particle Reaction
M - No MDA Calculation
R - Coincidence Corrected
H - Halflife limit exceeded

P - Positron Decay
S - Single-Escape
D - Double-Escape
K - Key Line
A - Not in Average
C - Coincidence Peak

- -

***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	1.1119E-02	1.1546E-02	2.0403E-01	2.0403E-01	2.250E-01
K-40		1.2563E+01	1.2563E+01	1.0142E+00	1.2566E+00	
MN-54	#A	-5.8142E-03	-5.8518E-03	2.9219E-02	2.9221E-02	3.025E-02
CO-57	#B	9.4451E-03	9.5158E-03	3.0956E-02	3.0960E-02	3.402E-02
CO-60	#B	-1.7333E-03	-1.7351E-03	9.6124E-02	9.6124E-02	3.397E-02
Sr-85	#A	-1.1229E-02	-1.1583E-02	2.9888E-02	2.9895E-02	3.214E-02
Kr-85	#A	-2.8783E+02	-2.8783E+02	8.1660E+02	8.1678E+02	7.462E+02
Y-88	#B	-1.1111E-03	-1.1323E-03	1.3128E-01	1.3128E-01	1.970E-02
NB-94	#B	6.2804E-03	6.2804E-03	2.3397E-02	2.3400E-02	2.655E-02
Ag-108M	#B	-1.5524E-02	-1.5525E-02	3.2018E-02	3.2032E-02	3.532E-02
CD-109		9.6320E-01	9.6749E-01	6.6926E-01	6.7141E-01	
SN-113	#B	9.9728E-03	1.0149E-02	3.1064E-02	3.1070E-02	3.416E-02
SB-125	#B	5.7180E-02	5.7294E-02	4.9964E-02	5.0079E-02	8.412E-02
I-131	#B	2.5702E-03	3.3017E-03	3.2393E-02	3.2394E-02	2.855E-02
CS-134	#B	9.5702E-03	9.5958E-03	1.0565E-02	1.0580E-02	2.788E-02
CS-137	#	1.6038E-01	1.6040E-01	4.3269E-02	4.4294E-02	
CE-139	#A	7.4304E-03	7.5400E-03	2.9316E-02	2.9320E-02	3.209E-02
EU-152	#B	2.4517E-02	2.4528E-02	9.0278E-02	9.0288E-02	1.000E-01
EU-154	#B	1.9038E-02	1.9050E-02	6.1593E-02	6.1602E-02	6.818E-02
EU-155	#	1.2975E-01	1.2989E-01	1.1096E-01	1.1119E-01	1.196E-01
HG-203	#B	-5.3492E-03	-5.5854E-03	3.0604E-02	3.0606E-02	2.822E-02
TL-208		2.2195E-01	2.2195E-01	4.3968E-02	4.5881E-02	
PB-212	#	6.2385E-01	6.2385E-01	8.7464E-02	9.4908E-02	7.287E-02
PB-214	#	3.8501E-01	3.8501E-01	7.7133E-02	8.0415E-02	6.444E-02
BI-212		6.5204E-01	6.5204E-01	2.9948E-01	3.0195E-01	
BI-214		3.6555E-01	3.6555E-01	7.4286E-02	7.7359E-02	
RA-224	#A	6.3288E-01	6.3288E-01	8.1243E-01	8.1329E-01	8.857E-01
RA-226	#	1.2725E+00	1.2725E+00	8.1835E-01	8.2180E-01	
AC-228		7.2557E-01	7.2557E-01	1.7999E-01	1.8502E-01	
TH-227	#A	-2.8052E-01	-2.8052E-01	3.0999E-01	3.1044E-01	3.354E-01
PA-234	#B	1.0007E-03	1.0007E-03	1.0383E-01	1.0383E-01	1.163E-01
TH-234	#B	7.6755E-01	7.6755E-01	8.5515E-01	8.5621E-01	1.534E+00
AM-241	#A	-2.7593E-03	-2.7593E-03	3.2553E-01	3.2553E-01	1.985E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (270.2 to 2000.1 keV) 1.6923904E+01 pCi/gm
Total Decayed Activity (270.2 to 2000.1 keV) 1.6928226E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JPK

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 107F_22AUG2006_1155.An1

Sample description
FSS-OOL-05-04-081-F

Spectrum Filename: C:\GammaVision\Spectra\107F_22AUG2006_1155.An1

Acquisition information
Start time: 22-Aug-2006 11:55:20
Live time: 2000
Real time: 2002
Dead time: 0.12 %
Detector ID: 2

Detector system
Det 107- DSPE- 634

Calibration
Filename: D7_1LSa.Clb
Detector 107 Calibration for 1 Liter Sand Marinelli

Energy Calibration
Created: 29-Oct-2004 06:48:53
Zero offset: 0.157 keV
Gain: 0.500 keV/channel
Quadratic: -1.676E-08 keV/channel^2

Efficiency Calibration
Created: 29-Oct-2004 06:51:32
Type: Polynomial
Uncertainty: 1.174 %
Coefficients: -0.279532 -4.778179 0.614896
-0.087174 0.005356 -0.000131

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.16keV)
Stop channel: 4000 (2000.15keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 1.6130E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.6130E+03) =
6.1996E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	19-Aug-2006 08:05:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	107_150K_28APR05.Pbc 01-May-2005 05:30:33
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 22 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.1177

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
74.52	358.	11.78	1.18	2.842E-02	74.81	9.600	1.085E+00	PB212
77.14	556.	8.10	1.18	2.965E-02	77.11	17.500	9.003E-01	PB212
					77.11	10.700	1.460E+00	PB214
86.87	178.	20.87	1.19	3.299E-02	86.45	32.740	1.389E-01	EU155
					88.04	3.790	1.187E+00	CD109
90.05	121.	28.78	1.19	3.379E-02				
93.32	210.	17.89	1.19	3.452E-02	92.38	2.570	1.920E+00	TH234
					92.80	3.000	1.545E+00	TH234
129.28	106.	41.25	1.79	3.819E-02				
185.97	218.	17.96	1.37	3.610E-02	185.99	3.280	1.544E+00	RA226
209.24	112.	26.92	1.15	3.429E-02				
238.78	1237.	3.52	1.30	3.188E-02	238.63	43.100	7.446E-01	PB212
241.71	239.	13.45	1.30	3.165E-02	241.00	3.900	1.603E+00	RA224
					241.92	7.470	8.417E-01	PB214
270.01	149.	23.74	1.50	2.946E-02				
277.47	66.	38.65	1.50	2.879E-02	279.17	81.500	PBC<MDA	HG203
295.31	293.	11.93	1.57	2.767E-02	295.22	19.200	4.545E-01	PB214
327.47	87.	32.64	1.97	2.563E-02				
338.60	330.	9.55	1.53	2.499E-02	338.40	12.010	9.128E-01	AC228
352.12	546.	6.49	1.68	2.425E-02	351.99	37.100	5.036E-01	PB214
463.15	111.	21.05	1.77	1.954E-02				
463.15	111.	21.05	1.77	1.954E-02	463.51	10.000	4.669E-01	SB125
511.01	211.	13.56	1.70	1.807E-02	510.72	22.500	3.652E-01	TL208
583.34	401.	8.65	1.71	1.629E-02	583.14	86.000	2.372E-01	TL208
609.49	374.	8.51	1.79	1.574E-02	609.32	46.090	4.269E-01	BI214
661.65	185.	12.14	1.51	1.477E-02	661.62	84.620	1.214E-01	CS137
727.52	148.	19.47	1.52	1.374E-02	727.17	11.800	7.554E-01	BI212

754.38	40.	37.68	1.18	1.337E-02				
786.41	46.	36.04	1.83	1.297E-02	785.42	2.000	1.478E+00	BI212
794.83	80.	21.13	1.95	1.285E-02				
794.83	80.	21.13	1.95	1.285E-02	795.76	85.400	6.067E-02	CS134
836.19	55.	26.28	1.24	1.237E-02	834.81	99.978	3.734E-02	MN54
911.53	356.	7.04	1.96	1.160E-02	911.07	29.000	8.742E-01	AC228
968.69	270.	10.13	2.07	1.109E-02	968.90	17.460	1.159E+00	AC228

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
1120.77	116.	21.61	2.35	9.970E-03	1120.28	15.040	6.482E-01	BI214
1174.45	76.	25.98	1.29	9.637E-03	1173.23	99.860	6.610E-02	CO60
1239.27	66.	27.62	0.67	9.257E-03				
1332.73	53.	22.02	1.48	8.772E-03	1332.51	99.980	4.708E-02	CO60
1461.19	1661.	2.50	2.15	8.189E-03	1460.75	10.700	1.583E+01	K40
1620.32	13.	36.85	0.91	7.569E-03	1620.56	2.750	PBC<MDA	BI212
1765.06	61.	13.18	1.18	7.084E-03	1764.51	15.920	4.554E-01	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
173.40	87.00	601.	178.	0.089	62.60	1.187	BI-207	D
179.76	90.18	546.	121.	0.061	86.35	1.189	PB-214	D
186.31	93.45	600.	210.	0.105	53.66	1.191	U-235	D
418.11	209.24	377.	112.	0.056	80.75	1.151	AC-228	
539.65	270.01	406.	149.	0.074	71.21	1.495	AC-228	s
654.55	327.47	265.	87.	0.043	97.93	1.966	AC-228	s
1508.32	754.38	72.	40.	0.020	113.05	1.175	PA-234	s
2478.12	1239.27	91.	66.	0.033	82.86	0.671	CO-56	s

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-212	149.29	74.81	698.	372.	0.186	33.52	1.178D
PB-212	153.89	77.11	732.	392.	0.196	27.75	1.179A
PB-214	153.89	77.11	1212.	160.	0.080	92.51	1.500A
EU-155	174.19	87.26	1398.	176.	0.088	93.11	1.500
CD-109	174.23	87.28	1307.	162.	0.081	97.39	1.500
TH-234	185.75	93.04	1297.	207.	0.103	73.89	1.500
TH-234	185.73	93.03	1273.	192.	0.096	73.83	1.500
RA-226	371.58	185.97	549.	218.	0.109	53.87	1.370s
PB-212	476.89	238.63	277.	1222.	0.611	10.17	1.297D
RA-224	482.92	241.64	910.	159.	0.080	82.55	1.500s
PB-214	483.47	241.92	446.	215.	0.108	46.05	1.299D
HG-203	554.56	277.47	306.	66.	0.033	115.94	1.500s
PB-214	590.24	295.31	336.	288.	0.144	35.79	1.566
AC-228	676.82	338.60	241.	327.	0.164	28.65	1.532s
PB-214	703.86	352.12	234.	541.	0.270	19.47	1.684s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
SB-125	925.87	463.14	142.	93.	0.046	60.62	1.500s
TL-208	1021.61	511.01	218.	177.	0.089	40.67	1.698s
TL-208	1166.26	583.34	210.	397.	0.198	25.95	1.714
BI-214	1218.56	609.49	172.	370.	0.185	25.52	1.788
Ag-108M	1222.64	611.53	262.	-89.	-0.045	83.36	1.561s
CS-137	1323.12	661.77	160.	242.	0.121	35.97	1.553
BI-212	1454.61	727.52	152.	146.	0.073	58.41	1.523s
BI-212	1572.38	786.41	81.	46.	0.023	108.13	1.825s
CS-134	1589.62	795.03	74.	58.	0.029	73.80	1.684s
AC-228	1822.63	911.53	82.	351.	0.176	21.13	1.960s
AC-228	1936.93	968.69	111.	268.	0.134	30.38	2.065s
BI-214	2241.10	1120.77	128.	116.	0.058	64.82	2.353s
CO-60	2348.48	1174.45	114.	76.	0.038	77.94	1.285s
CO-60	2665.04	1332.73	36.	49.	0.025	66.06	1.479
K-40	2921.97	1461.19	25.	1656.	0.828	7.50	2.150
BI-212	3240.26	1620.32	5.	13.	0.006	110.55	0.914s
BI-214	3529.77	1765.06	3.	61.	0.031	39.55	1.181s

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	Peak MDA Value pCi/gm	COMMENTS
BE-7		1.0817E-01					
			477.56	1.082E-01	%(	2.841E-01 8.54E-02 G	
K-40		1.5834E+01					
			1460.75	1.583E+01	(P	2.465E-01 3.97E-01 G	
MN-54		-9.9710E-03					
			834.81	-9.971E-03	%(P	3.701E-02 1.10E-02 G	
CO-57		1.9965E-03					
			122.07	1.996E-03	%(P	3.935E-02 1.17E-02 G K	
			136.43	3.961E-02	% P	2.980E-01 8.92E-02 G	
CO-60		5.6584E-02					
			1332.51	4.708E-02	(P	2.924E-02 1.12E-02 G K	
			1173.23	6.610E-02	*(P	4.576E-02 1.81E-02 G K	
Sr-85		-2.3703E-02					
			514.00	-2.370E-02	%(	4.194E-02 1.28E-02 G	

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
Kr-85	-5.6146E+02						
		513.99	-5.615E+02	%(P	9.404E+02	2.85E+02	G
Y-88	-1.8701E-04						
		1836.01	-1.870E-04	&(P	2.064E-02	5.08E-03	G K
		898.02	7.732E-03	% P	2.734E-02	7.98E-03	G
NB-94	4.0300E-03						
		871.10	4.030E-03	%(P	2.775E-02	8.02E-03	G K
		702.50	5.455E-03	% P	2.953E-02	8.65E-03	G K
Ag-108M	-5.4115E-03						
		722.95	-5.411E-03	&(	3.726E-02	1.09E-02	G K
		614.37	-5.279E-02	+	4.629E-02	1.47E-02	G
		433.93	4.575E-03	& P	2.863E-02	8.42E-03	G
CD-109	1.0813E+00						
		88.04	1.081E+00	&(P	1.143E+00	3.52E-01	G
SN-113	-1.1533E-02						
		391.71	-1.153E-02	%(P	4.287E-02	1.27E-02	G K
		255.04	4.374E-01	%	1.301E+00	3.91E-01	G
SB-125	8.8099E-02						
		427.95	-1.714E-02	%(P	8.874E-02	2.61E-02	G K
		600.77	2.266E-02	% P	1.436E-01	4.19E-02	G
		636.15	7.821E-02	% P	2.397E-01	7.13E-02	G
		463.51	3.996E-01	(P	2.505E-01	8.32E-02	G
		176.29	-7.291E-03	% P	4.429E-01	1.31E-01	G
I-131	-6.7714E-03						
		364.48	-6.771E-03	&(	4.326E-02	1.28E-02	G K
		636.97	7.714E-03	%	5.274E-01	1.52E-01	G
		284.29	-5.410E-02	&	5.991E-01	1.78E-01	G
CS-134	2.1813E-02						
		604.66	2.114E-03	%(P	6.804E-02	2.02E-02	G K
		795.76	4.433E-02	*(P	3.289E-02	1.10E-02	G
		569.29	0.000E+00	&	2.012E-01	5.84E-02	G
		801.84	-1.125E-01	% P	3.674E-01	1.09E-01	G
CS-137	1.6255E-01						
		661.62	1.625E-01	(P	4.128E-02	1.98E-02	G
CE-139	-1.2416E-03						
		165.85	-1.242E-03	%(P	3.422E-02	1.02E-02	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments

EU-152      -1.0445E-04
                          121.78-1.044E-04 %(P 1.137E-01 3.39E-02 G K
                          344.30 7.964E-03 % P 8.059E-02 2.36E-02 G
                         1408.08 8.435E-02 % P 1.152E-01 3.67E-02 G
                          964.00 9.306E-03 & P 4.150E-01 1.22E-01 G
                         1112.07 1.073E-01 % P 2.692E-01 8.07E-02 G
                          778.90-3.234E-02 % P 2.391E-01 6.94E-02 G

EU-154       5.6898E-03
                          123.10 5.690E-03 %(P 8.237E-02 2.46E-02 G K
                         1274.80-1.603E-02 % P 1.037E-01 2.99E-02 G
                          723.30-2.601E-02 & P 1.779E-01 5.21E-02 G
                         1004.80-1.180E-02 & P 2.149E-01 6.19E-02 G

EU-155       1.3702E-01
                           86.45 1.370E-01  (  1.380E-01 4.25E-02 G K
                          105.31 3.831E-02 % P 1.639E-01 4.93E-02 G

HG-203       2.4689E-02
                          279.17 2.469E-02 &(P 3.150E-02 9.73E-03 G K
                           72.87-2.882E-01 % P 1.093E+00 3.29E-01 G
                           70.83-1.225E-01 %   1.798E+00 5.39E-01 G
                           82.50-7.249E-01 &   2.187E+00 6.60E-01 G

TL-208       2.3715E-01
                          583.14 2.372E-01  (P 4.205E-02 2.08E-02 G
                          510.72 3.652E-01 + P 1.472E-01 5.89E-02 G

PB-212       7.4461E-01
                          238.63 7.446E-01  (P 4.894E-02 2.56E-02 G K
                                                         Energy duplication
                           77.11 6.352E-01 }   2.085E-01 5.88E-02 G
                           74.81 1.139E+00 + P 3.854E-01 1.29E-01 G

PB-214       4.8686E-01
                          351.99 5.036E-01 *(P 6.888E-02 3.30E-02 G K
                          295.22 4.545E-01  (P 1.389E-01 5.51E-02 G
                                                         Energy duplication
                           77.11 4.229E-01 } P 4.367E-01 1.30E-01 G
                          241.92 7.629E-01 + P 3.585E-01 1.18E-01 G

BI-212       7.5538E-01
                          727.17 7.554E-01 @(P 3.106E-01 1.48E-01 G K
                         1620.56 5.232E-01 - P 5.286E-01 2.00E-01 G
                          785.42 1.478E+00 + P 1.445E+00 5.48E-01 G

BI-214       4.3419E-01
                          609.32 4.269E-01  (P 7.377E-02 3.67E-02 G K
                         1764.51 4.554E-01 @(P 7.698E-02 6.09E-02 G
```

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 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                         1120.28 6.482E-01 + P 3.097E-01 1.41E-01 G

RA-224       1.0799E+00
                          241.00 1.080E+00 ?(P 9.710E-01 3.01E-01 G

RA-226       1.5438E+00
                          185.99 1.544E+00 *(  7.915E-01 2.77E-01 G

AC-228       8.8552E-01
                          911.07 8.742E-01 @(P 1.116E-01 6.23E-02 G K
                          968.90 1.159E+00 + P 2.241E-01 1.18E-01 G
                          338.40 9.128E-01  (P 2.093E-01 8.81E-02 G

TH-227      -2.7018E-01
                          236.00-2.702E-01 %(P 3.672E-01 1.12E-01 G K
                          256.25 5.047E-02 & P 3.616E-01 1.07E-01 G

PA-234      -5.9307E-04
                           98.44-5.931E-04 &(  1.421E-01 4.24E-02 G K
                          946.00-3.681E-02 %   1.544E-01 4.53E-02 G
                          131.28-1.602E-02 &   1.643E-01 4.91E-02 G
                           94.67-9.065E-02 %   2.726E-01 8.23E-02 G
                          883.24 1.234E-03 &   2.136E-01 6.00E-02 G
                          926.70 1.902E-02 &   2.987E-01 8.59E-02 G
                          569.26 0.000E+00 &   2.977E-01 8.64E-02 G

TH-234       1.2627E+00
                           63.29 5.716E-01 %(P 1.762E+00 5.30E-01 G K
                           92.80 1.561E+00  (P 1.373E+00 4.24E-01 G
                           92.38 1.964E+00  (P 1.621E+00 5.02E-01 G

AM-241       2.6640E-02
                           59.54 2.664E-02 %(P 2.195E-01 6.57E-02 G
   ( - This peak used in the nuclide activity average.

   * - Peak is too wide, but only one peak in library.
   ! - Peak is part of a multiplet and this area went
       negative during deconvolution.
   ? - Peak is too narrow.
   @ - Peak is too wide at FW25M, but ok at FWHM.
   % - Peak fails sensitivity test.
   $ - Peak identified, but first peak of this nuclide
       failed one or more qualification tests.
   + - Peak activity higher than counting uncertainty range.
   - - Peak activity lower than counting uncertainty range.
   = - Peak outside analysis energy range.
   & - Calculated peak centroid is not close enough to the
```

library energy centroid for positive identification.
P - Peakbackground subtraction
} - Peak is too close to another for the activity
to be found directly.

Nuclide Codes:	Peak Codes:
T - Thermal Neutron Activation	G - Gamma Ray
F - Fast Neutron Activation	X - X-Ray
I - Fission Product	P - Positron Decay
N - Naturally Occurring Isotope	S - Single-Escape
P - Photon Reaction	D - Double-Escape
C - Charged Particle Reaction	K - Key Line
M - No MDA Calculation	A - Not in Average
R - Coincidence Corrected	C - Coincidence Peak
H - Halflife limit exceeded	

- -

***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	1.0382E-01	1.0817E-01	2.5630E-01	2.5638E-01	2.727E-01
K-40		1.5834E+01	1.5834E+01	1.1909E+00	1.5142E+00	
MN-54	#A	-9.9013E-03	-9.9710E-03	3.4860E-02	3.4865E-02	3.675E-02
CO-57	#B	1.9803E-03	1.9965E-03	3.5243E-02	3.5244E-02	3.903E-02
CO-60		5.6520E-02	5.6584E-02	3.0754E-02	3.0935E-02	
Sr-85	#A	-2.2916E-02	-2.3703E-02	3.8364E-02	3.8390E-02	4.055E-02
Kr-85	#A	-5.6145E+02	-5.6146E+02	9.6116E+02	9.6173E+02	9.404E+02
Y-88	#B	-1.8321E-04	-1.8701E-04	2.2105E-02	2.2105E-02	2.022E-02
NB-94	#B	4.0300E-03	4.0300E-03	2.4059E-02	2.4060E-02	2.775E-02
Ag-108M	#B	-5.4112E-03	-5.4115E-03	3.2767E-02	3.2768E-02	3.725E-02
CD-109	#A	1.0761E+00	1.0813E+00	1.0552E+00	1.0569E+00	1.137E+00
SN-113	#B	-1.1316E-02	-1.1533E-02	4.6045E-02	4.6050E-02	4.207E-02
SB-125	#B	8.7909E-02	8.8099E-02	5.5023E-02	5.5269E-02	8.855E-02
I-131	#B	-5.1566E-03	-6.7714E-03	3.8431E-02	3.8433E-02	3.295E-02
CS-134	#B	2.1749E-02	2.1813E-02	1.6245E-02	1.6296E-02	6.784E-02
CS-137		1.6252E-01	1.6255E-01	5.9322E-02	6.0094E-02	
CE-139	#A	-1.2220E-03	-1.2416E-03	3.5665E-02	3.5665E-02	3.368E-02
EU-152	#B	-1.0440E-04	-1.0445E-04	2.8085E-02	2.8085E-02	1.137E-01
EU-154	#B	5.6858E-03	5.6898E-03	7.3826E-02	7.3827E-02	8.231E-02
EU-155	#A	1.3686E-01	1.3702E-01	1.2758E-01	1.2780E-01	1.379E-01
HG-203	#A	2.3555E-02	2.4689E-02	2.9187E-02	2.9223E-02	3.005E-02
TL-208		2.3715E-01	2.3715E-01	6.2254E-02	6.3811E-02	
PB-212		7.4461E-01	7.4461E-01	7.6714E-02	8.8425E-02	
PB-214		4.8686E-01	4.8686E-01	9.5669E-02	9.9897E-02	
BI-212		7.5538E-01	7.5538E-01	4.4510E-01	4.4733E-01	
BI-214		4.3419E-01	4.3419E-01	1.0359E-01	1.0672E-01	
RA-224	#	1.0799E+00	1.0799E+00	9.0397E-01	9.0622E-01	9.710E-01
RA-226	#	1.5438E+00	1.5438E+00	8.3168E-01	8.3666E-01	
AC-228	#	8.8552E-01	8.8552E-01	1.5929E-01	1.6765E-01	

TH-227 #B	-2.7018E-01	-2.7018E-01	3.3864E-01	3.3902E-01	3.672E-01

PA-234 #B	-5.9307E-04	-5.9307E-04	1.2706E-01	1.2706E-01	1.421E-01
TH-234 #B	1.2627E+00	1.2627E+00	9.6909E-01	9.7161E-01	1.762E+00
AM-241 #A	2.6639E-02	2.6640E-02	1.9715E-01	1.9716E-01	2.195E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (269.7 to 2000.1 keV) 2.1140835E+01 pCi/gm
Total Decayed Activity (269.7 to 2000.1 keV) 2.1140938E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JJM

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 107F_22AUG2006_1249.An1

Sample description
FSS-OOL-05-04-081-F-RC

Spectrum Filename: C:\GammaVision\Spectra\107F_22AUG2006_1249.An1

Acquisition information
Start time: 22-Aug-2006 12:49:30
Live time: 2000
Real time: 2002
Dead time: 0.12 %
Detector ID: 2

Detector system
Det 107- DSPE- 634

Calibration
Filename: D7_1LSa.Clb
Detector 107 Calibration for 1 Liter Sand Marinelli

Energy Calibration
Created: 29-Oct-2004 06:48:53
Zero offset: 0.157 keV
Gain: 0.500 keV/channel
Quadratic: -1.676E-08 keV/channel^2

Efficiency Calibration
Created: 29-Oct-2004 06:51:32
Type: Polynomial
Uncertainty: 1.174 %
Coefficients: -0.279532 -4.778179 0.614896
-0.087174 0.005356 -0.000131

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.16keV)
Stop channel: 4000 (2000.15keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 1.6130E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.6130E+03) =
6.1996E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	19-Aug-2006 08:05:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	107_150K_28APR05.Pbc 01-May-2005 05:30:33
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 21 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.2123

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
74.79	334.	12.51	1.18	2.849E-02	74.81	9.600	1.024E+00	PB212
77.09	463.	7.61	1.18	2.957E-02	77.11	10.700	1.394E+00	PB214
					77.11	17.500	8.599E-01	PB212
86.89	157.	33.98	1.19	3.296E-02	86.45	32.740	1.222E-01	EU155
					88.04	3.790	PBC<MDA	CD109
92.85	199.	28.34	1.83	3.439E-02	92.38	2.570	1.812E+00	TH234
					92.80	3.000	1.453E+00	TH234
186.24	208.	22.55	1.69	3.608E-02	185.99	3.280	1.474E+00	RA226
209.51	141.	28.75	1.69	3.427E-02				
238.77	1251.	3.47	1.30	3.189E-02	238.63	43.100	7.528E-01	PB212
242.24	166.	17.23	1.30	3.161E-02	241.00	3.900	1.108E+00	RA224
					241.92	7.470	5.829E-01	PB214
270.38	101.	26.60	1.24	2.943E-02				
295.47	270.	9.20	1.34	2.767E-02	295.22	19.200	4.188E-01	PB214
300.21	82.	25.61	1.34	2.735E-02				
328.39	82.	32.88	0.95	2.558E-02				
338.56	300.	10.55	1.73	2.499E-02	338.40	12.010	8.274E-01	AC228
352.09	519.	6.51	1.64	2.425E-02	351.99	37.100	4.780E-01	PB214
463.39	88.	24.97	1.69	1.953E-02				
463.39	88.	24.97	1.69	1.953E-02	463.51	10.000	3.646E-01	SB125
511.02	215.	12.30	2.06	1.807E-02	510.72	22.500	3.726E-01	TL208
583.42	490.	7.46	1.63	1.628E-02	583.14	86.000	2.906E-01	TL208
609.54	384.	6.40	1.45	1.574E-02	609.32	46.090	4.386E-01	BI214
662.24	205.	12.11	1.84	1.476E-02	661.62	84.620	1.349E-01	CS137
727.49	102.	31.34	1.08	1.374E-02	727.17	11.800	5.182E-01	BI212
786.23	27.	39.45	0.77	1.297E-02	785.42	2.000	PBC<MDA	BI212
795.15	42.	36.45	1.68	1.284E-02	795.76	85.400	PBC<MDA	CS134

911.41	360.	7.36	2.11	1.160E-02	911.07	29.000	8.842E-01	AC228
964.51	62.	17.48	1.80	1.113E-02	964.00	14.580	PBC<MDA	EU152
969.18	178.	9.21	1.80	1.109E-02	968.90	17.460	7.618E-01	AC228
1120.97	98.	23.22	1.90	9.965E-03	1120.28	15.040	5.426E-01	BI214

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
1461.12	1638.	2.54	2.10	8.189E-03	1460.75	10.700	1.561E+01	K40
1764.92	80.	12.54	1.79	7.082E-03	1764.51	15.920	5.847E-01	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
418.67	209.51	574.	141.	0.070	86.25	1.694	AC-228	s
540.39	270.38	272.	101.	0.051	79.81	1.240	AC-228	
599.67	300.03	261.	97.	0.048	81.95	1.586	PB-212	sM
656.39	328.39	248.	82.	0.041	98.63	0.951	RH-106M	
1929.04	964.48	25.	64.	0.032	49.63	1.796	AC-228	D

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.
M - Peak is close to a library peak.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-212	149.29	74.81	730.	334.	0.167	37.53	1.178D
PB-212	153.89	77.11	779.	463.	0.232	22.82	1.179A
EU-155	174.28	87.31	1416.	177.	0.089	92.80	1.500
TH-234	185.99	93.16	1299.	160.	0.080	87.12	1.500s
RA-226	372.13	186.24	715.	208.	0.104	67.66	1.687s
TH-227	471.75	236.06	1193.	-128.	-0.064	117.78	1.500s
PB-212	476.89	238.63	336.	1230.	0.615	10.46	1.297D
PB-214	483.47	241.92	486.	164.	0.082	61.06	1.299D
PB-214	590.20	295.29	366.	257.	0.128	41.00	1.242
AC-228	676.73	338.56	253.	297.	0.148	31.65	1.728s
PB-214	703.79	352.09	227.	513.	0.257	19.52	1.644s
SB-125	925.45	462.92	144.	79.	0.040	69.60	1.500s
TL-208	1021.63	511.02	189.	181.	0.090	36.89	2.058s
TL-208	1166.42	583.42	206.	486.	0.243	22.37	1.628s
BI-214	1218.65	609.54	89.	380.	0.190	19.20	1.449
CS-137	1324.05	662.24	128.	201.	0.101	36.32	1.839s
BI-212	1454.55	727.49	209.	100.	0.050	94.03	1.079s
BI-212	1572.02	786.23	48.	27.	0.013	118.34	0.769s
CS-134	1589.87	795.15	100.	42.	0.021	109.36	1.684s
AC-228	1822.38	911.41	102.	355.	0.178	22.09	2.109s
AC-228	1937.36	968.90	56.	176.	0.088	28.41	1.799D

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
BI-214	2241.51	1120.97	121.	97.	0.049	69.67	1.904s
K-40	2921.83	1461.12	22.	1633.	0.817	7.61	2.099
BI-214	3529.50	1764.92	6.	79.	0.039	37.61	1.795

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	Peak MDA Value pCi/gm	COMMENTS
BE-7		8.0208E-02					
			477.56	8.021E-02	%(	2.560E-01 7.64E-02	G
K-40		1.5614E+01					
			1460.75	1.561E+01	(P	2.326E-01 3.97E-01	G
MN-54		4.6950E-03					
			834.81	4.695E-03	%(P	2.947E-02 8.56E-03	G
CO-57		4.8229E-04					
			122.07	4.823E-04	&(P	3.907E-02 1.16E-02	G K
			136.43	-3.112E-04	% P	2.995E-01 8.92E-02	G
CO-60		1.9273E-02					
			1332.51	1.927E-02	%(P	3.602E-02 1.09E-02	G K
			1173.23	2.357E-02	% P	4.559E-02 1.38E-02	G K
Sr-85		-2.0834E-02					
			514.00	-2.083E-02	&(	4.031E-02 1.23E-02	G
Kr-85		-4.9693E+02					
			513.99	-4.969E+02	&(P	9.036E+02 2.73E+02	G
Y-88		-2.6310E-03					
			1836.01	-2.631E-03	%(P	2.275E-02 5.83E-03	G K
			898.02	-5.016E-03	& P	4.124E-02 1.19E-02	G
NB-94		6.5936E-04					
			871.10	6.594E-04	%(P	2.194E-02 6.12E-03	G K
			702.50	8.556E-03	% P	3.248E-02 9.63E-03	G K
Ag-108M		-4.4317E-03					
			722.95	-4.432E-03	&(	4.270E-02 1.25E-02	G K
			614.37	-2.564E-02	%	4.051E-02 1.24E-02	G
			433.93	-2.704E-04	& P	2.899E-02 8.40E-03	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CD-109	-3.0569E-02						
		88.04	-3.057E-02	%(P	1.258E+00	3.76E-01	G
SN-113	9.5266E-03						
		391.71	9.527E-03	%(P	4.500E-02	1.34E-02	G K
		255.04	2.188E-01	%	1.378E+00	4.11E-01	G
SB-125	9.3902E-02						
		427.95	1.014E-02	&(P	9.020E-02	2.65E-02	G K
		600.77	-3.092E-02	% P	1.568E-01	4.58E-02	G
		636.15	-1.938E-02	& P	2.555E-01	7.38E-02	G
		463.51	3.418E-01	(P	2.521E-01	8.21E-02	G
		176.29	-1.113E-02	& P	4.833E-01	1.44E-01	G
I-131	-4.2320E-03						
		364.48	-4.232E-03	%(	4.199E-02	1.24E-02	G K
		636.97	0.000E+00	&	4.560E-01	1.30E-01	G
		284.29	1.684E-01	%	5.819E-01	1.74E-01	G
CS-134	1.5955E-02						
		604.66	1.648E-03	%(P	2.734E-02	7.90E-03	G K
		795.76	3.231E-02	*(P	3.783E-02	1.19E-02	G
		569.29	-1.756E-02	%	1.919E-01	5.60E-02	G
		801.84	7.755E-02	% P	3.290E-01	9.66E-02	G
CS-137	1.3493E-01						
		661.62	1.349E-01	@(P	3.712E-02	1.66E-02	G
CE-139	-1.4678E-02						
		165.85	-1.468E-02	%(P	3.652E-02	1.10E-02	G
EU-152	1.0821E-02						
		121.78	1.082E-02	&(P	9.177E-02	2.74E-02	G K
		344.30	-3.164E-04	% P	9.850E-02	2.88E-02	G
		1408.08	4.974E-02	% P	1.267E-01	3.76E-02	G
		964.00	7.904E-03	& P	4.010E-01	1.18E-01	G
		1112.07	7.520E-03	& P	2.964E-01	8.50E-02	G
		778.90	-3.090E-03	& P	2.133E-01	6.05E-02	G
EU-154	-1.4876E-03						
		123.10	-1.488E-03	&(P	8.179E-02	2.44E-02	G K
		1274.80	-2.952E-02	% P	1.186E-01	3.49E-02	G
		723.30	-5.489E-02	& P	1.994E-01	5.93E-02	G
		1004.80	-4.443E-02	% P	2.191E-01	6.43E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
EU-155	1.3835E-01						
		86.45	1.384E-01	(	1.389E-01	4.28E-02	G K
		105.31	4.050E-02	% P	1.588E-01	4.78E-02	G
HG-203	4.7057E-03						
		279.17	4.706E-03	%(P	3.571E-02	1.06E-02	G K
		72.87	-3.950E-01	& P	1.100E+00	3.32E-01	G
		70.83	-1.214E+00	&	1.735E+00	5.30E-01	G
		82.50	-4.442E-01	%	2.175E+00	6.54E-01	G
TL-208	2.9055E-01						
		583.14	2.906E-01	@(P	4.163E-02	2.19E-02	G
		510.72	3.726E-01	+ P	1.375E-01	5.44E-02	G
PB-212	7.4961E-01						
		238.63	7.496E-01	(P	5.371E-02	2.65E-02	G K
							Energy duplication
		77.11	7.496E-01	}	2.149E-01	5.70E-02	G
		74.81	1.024E+00	+ P	3.938E-01	1.30E-01	G
PB-214	4.7800E-01						
		351.99	4.780E-01	@(P	6.781E-02	3.14E-02	G K
		295.22	4.047E-01	- P	1.449E-01	5.63E-02	G
							Energy duplication
		77.11	1.603E-01	} P	4.442E-01	1.34E-01	G
		241.92	5.817E-01	+ P	3.738E-01	1.19E-01	G
BI-212	5.6832E-01						
		727.17	5.182E-01	(P	3.618E-01	1.65E-01	G K
		1620.56	2.787E-01	% P	7.174E-01	2.11E-01	G
		785.42	8.638E-01	(P	1.133E+00	3.57E-01	G
BI-214	4.3864E-01						
		609.32	4.386E-01	(P	5.393E-02	2.84E-02	G K
		1764.51	5.847E-01	+ P	1.070E-01	7.41E-02	G
		1120.28	5.426E-01	+ P	3.014E-01	1.27E-01	G
RA-224	2.4173E-01						
		241.00	2.417E-01	%(P	1.061E+00	3.19E-01	G
RA-226	1.4745E+00						
		185.99	1.474E+00	*(	9.005E-01	3.33E-01	G
AC-228	8.3609E-01						
		911.07	8.842E-01	*(P	1.237E-01	6.59E-02	G K
		968.90	7.622E-01	(P	1.623E-01	7.31E-02	G
		338.40	8.274E-01	(P	2.145E-01	8.83E-02	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments

TH-227      -2.9808E-01
                          236.00-2.981E-01 ?(P 3.812E-01 1.17E-01 G K
                          256.25 6.758E-02 % P 4.038E-01 1.20E-01 G

PA-234      -8.5758E-02
                           98.44-8.576E-02 &(  1.261E-01 3.86E-02 G K
                          946.00-1.469E-02 %   1.483E-01 4.26E-02 G
                          131.28 8.564E-02 &   1.411E-01 4.30E-02 G
                           94.67-1.140E-01 %   2.674E-01 8.10E-02 G
                          883.24-2.107E-02 %   2.344E-01 6.72E-02 G
                          926.70-5.832E-02 %   2.894E-01 8.47E-02 G
                          569.26-2.514E-02 %   2.837E-01 8.28E-02 G

TH-234       9.4075E-01
                           63.29 6.618E-01 %(P 1.746E+00 5.26E-01 G K
                           92.80 1.303E+00  (P 1.386E+00 4.25E-01 G
                           92.38-1.466E-01 % P 1.677E+00 5.00E-01 G

AM-241      -5.6212E-04
                           59.54-5.621E-04 &(P 2.064E-01 6.14E-02 G
   ( - This peak used in the nuclide activity average.

   * - Peak is too wide, but only one peak in library.
   ! - Peak is part of a multiplet and this area went
       negative during deconvolution.
   ? - Peak is too narrow.
   @ - Peak is too wide at FW25M, but ok at FWHM.
   % - Peak fails sensitivity test.
   $ - Peak identified, but first peak of this nuclide
       failed one or more qualification tests.
   + - Peak activity higher than counting uncertainty range.
   - - Peak activity lower than counting uncertainty range.
   = - Peak outside analysis energy range.
   & - Calculated peak centroid is not close enough to the
       library energy centroid for positive identification.
   P - Peakbackground subtraction
   } - Peak is too close to another for the activity
       to be found directly.

   Nuclide Codes:                      Peak Codes:
   T - Thermal Neutron Activation      G - Gamma Ray
   F - Fast Neutron Activation         X - X-Ray
   I - Fission Product                 P - Positron Decay
   N - Naturally Occurring Isotope     S - Single-Escape
   P - Photon Reaction                 D - Double-Escape
   C - Charged Particle Reaction       K - Key Line
   M - No MDA Calculation              A - Not in Average
```

R - Coincidence Corrected C - Coincidence Peak
H - Halflife limit exceeded

- -

***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	7.6947E-02	8.0208E-02	2.2925E-01	2.2930E-01	2.456E-01
K-40		1.5614E+01	1.5614E+01	1.1912E+00	1.5065E+00	
MN-54	#A	4.6618E-03	4.6950E-03	2.5682E-02	2.5683E-02	2.926E-02
CO-57	#B	4.7835E-04	4.8229E-04	3.4944E-02	3.4944E-02	3.875E-02
CO-60	#B	1.9250E-02	1.9273E-02	3.2578E-02	3.2598E-02	3.598E-02
Sr-85	#A	-2.0134E-02	-2.0834E-02	3.6760E-02	3.6780E-02	3.895E-02
Kr-85	#A	-4.9692E+02	-4.9693E+02	9.3443E+02	9.3489E+02	9.036E+02
Y-88	#B	-2.5769E-03	-2.6310E-03	3.9618E-02	3.9618E-02	2.228E-02
NB-94	#B	6.5936E-04	6.5936E-04	1.8349E-02	1.8349E-02	2.194E-02
Ag-108M	#B	-4.4315E-03	-4.4317E-03	3.7577E-02	3.7578E-02	4.270E-02
CD-109	#A	-3.0420E-02	-3.0569E-02	1.2991E+00	1.2991E+00	1.252E+00
SN-113	#B	9.3449E-03	9.5266E-03	4.0065E-02	4.0069E-02	4.414E-02
SB-125	#F	9.3696E-02	9.3902E-02	6.7670E-02	6.7897E-02	9.001E-02
I-131	#B	-3.2123E-03	-4.2320E-03	3.7103E-02	3.7104E-02	3.187E-02
CS-134	#B	1.5908E-02	1.5955E-02	1.7668E-02	1.7693E-02	2.726E-02
CS-137	#	1.3490E-01	1.3493E-01	4.9862E-02	5.0495E-02	
CE-139	#A	-1.4444E-02	-1.4678E-02	3.3553E-02	3.3564E-02	3.594E-02
EU-152	#B	1.0816E-02	1.0821E-02	8.2133E-02	8.2135E-02	9.173E-02
EU-154	#B	-1.4865E-03	-1.4876E-03	1.0932E-01	1.0932E-01	8.173E-02
EU-155	#A	1.3819E-01	1.3835E-01	1.2840E-01	1.2863E-01	1.388E-01
HG-203	#B	4.4871E-03	4.7057E-03	3.1808E-02	3.1810E-02	3.405E-02
TL-208	#	2.9055E-01	2.9055E-01	6.5603E-02	6.7810E-02	
PB-212		7.4961E-01	7.4961E-01	7.9408E-02	9.0915E-02	
PB-214		4.7800E-01	4.7800E-01	9.4230E-02	9.8368E-02	
BI-212		5.6832E-01	5.6832E-01	4.4416E-01	4.4542E-01	
BI-214		4.3864E-01	4.3864E-01	8.5183E-02	8.9035E-02	
RA-224	#A	2.4173E-01	2.4173E-01	9.5663E-01	9.5673E-01	1.061E+00
RA-226	#	1.4745E+00	1.4745E+00	9.9766E-01	1.0015E+00	
AC-228		8.3609E-01	8.3609E-01	1.3514E-01	1.4387E-01	
TH-227	#A	-2.9808E-01	-2.9808E-01	3.5182E-01	3.5226E-01	3.812E-01
PA-234	#B	-8.5758E-02	-8.5758E-02	1.1567E-01	1.1576E-01	1.261E-01
TH-234	#B	9.4075E-01	9.4075E-01	9.2028E-01	9.2176E-01	1.746E+00
AM-241	#A	-5.6211E-04	-5.6212E-04	7.6527E-01	7.6527E-01	2.064E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.

H - Halflife limit exceeded

YAEC Chemistry Lab Spectrum name: 107F_22AUG2006_1249.An1

---------- S U M M A R Y ----------

Total Activity (1120.2 to 2000.1 keV) 2.0585012E+01 pCi/gm
Total Decayed Activity (1120.2 to 2000.1 keV) 2.0585045E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JPK

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 107F_22AUG2006_1436.An1

Sample description
FSS-OOL-05-04-086-F-B

Spectrum Filename: C:\GammaVision\Spectra\107F_22AUG2006_1436.An1

Acquisition information
Start time: 22-Aug-2006 14:36:50
Live time: 2000
Real time: 2002
Dead time: 0.09 %
Detector ID: 2

Detector system
Det 107- DSPE- 634

Calibration
Filename: D7_1LSa.Clb
Detector 107 Calibration for 1 Liter Sand Marinelli

Energy Calibration
Created: 29-Oct-2004 06:48:53
Zero offset: 0.157 keV
Gain: 0.500 keV/channel
Quadratic: -1.676E-08 keV/channel^2

Efficiency Calibration
Created: 29-Oct-2004 06:51:32
Type: Polynomial
Uncertainty: 1.174 %
Coefficients: -0.279532 -4.778179 0.614896
-0.087174 0.005356 -0.000131

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.16keV)
Stop channel: 4000 (2000.15keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 1.5100E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.5100E+03) =
6.6225E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	20-Aug-2006 15:00:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	107_150K_28APR05.Pbc 01-May-2005 05:30:33
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 17 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.2836

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
62.81	110.	41.18	1.71	1.965E-02				
62.81	110.	41.18	1.71	1.965E-02	63.29	3.900	PBC<MDA	TH234
75.00	234.	17.59	1.18	2.867E-02	74.81	9.600	7.544E-01	PB212
76.91	319.	13.17	1.18	2.956E-02				
76.91	319.	13.17	1.18	2.956E-02	77.11	10.700	8.881E-01	PB214
					77.11	17.500	5.512E-01	PB212
92.61	225.	23.33	1.80	3.434E-02	92.38	2.570	2.202E+00	TH234
					92.80	3.000	1.779E+00	TH234
185.84	205.	18.38	1.88	3.611E-02	185.99	3.280	1.549E+00	RA226
239.19	1346.	4.66	2.03	3.185E-02	238.63	43.100	8.658E-01	PB212
295.20	212.	12.62	1.85	2.768E-02				
295.20	212.	12.62	1.85	2.768E-02	295.22	19.200	3.499E-01	PB214
328.43	57.	39.44	1.02	2.558E-02				
338.42	263.	13.78	1.68	2.500E-02	338.40	12.010	7.730E-01	AC228
352.13	440.	8.09	1.63	2.425E-02	351.99	37.100	4.321E-01	PB214
463.23	50.	35.24	1.50	1.953E-02	463.51	10.000	PBC<MDA	SB125
477.97	156.	16.93	2.39	1.906E-02	477.56	10.300	7.303E-01	BE7
510.57	195.	12.91	2.37	1.809E-02	510.72	22.500	3.541E-01	TL208
583.42	376.	6.93	1.62	1.628E-02	583.14	86.000	2.373E-01	TL208
609.62	328.	9.82	2.13	1.574E-02	609.32	46.090	3.997E-01	BI214
661.98	162.	18.90	1.39	1.476E-02	661.62	84.620	1.136E-01	CS137
726.06	145.	14.68	1.20	1.376E-02	727.17	11.800	7.942E-01	BI212
911.40	306.	9.10	2.42	1.160E-02	911.07	29.000	8.030E-01	AC228
967.96	242.	12.27	2.17	1.110E-02	968.90	17.460	1.108E+00	AC228
1120.55	112.	23.74	2.41	9.970E-03	1120.28	15.040	6.668E-01	BI214
1332.27	21.	39.86	2.03	8.773E-03	1332.51	99.980	PBC<MDA	CO60
1461.12	1357.	2.85	2.77	8.189E-03	1460.75	10.700	1.381E+01	K40

1765.16	60.	14.13	1.00	7.084E-03	1764.51	15.920	4.754E-01	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
125.29	62.81	770.	110.	0.055	123.54	1.706	AM-241	l
149.67	75.17	734.	234.	0.117	52.78	1.178	PB-214	D
153.48	77.07	721.	319.	0.159	39.50	1.179	PB-212	D
478.02	239.19	1595.	450.	0.225	40.21	2.034	PB-212	s
656.47	328.43	195.	57.	0.029	118.33	1.022	RH-106M	

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-214	153.89	77.11	1516.	195.	0.098	85.17	1.500D
PB-212	153.89	77.11	1511.	200.	0.100	85.17	1.500D
TH-234	185.70	93.02	1131.	124.	0.062	101.65	1.500s
RA-226	371.32	185.84	486.	205.	0.102	55.15	1.877s
PB-212	477.19	238.78	883.	866.	0.433	17.40	1.500s
PB-214	590.45	295.41	331.	175.	0.087	48.29	1.500s
AC-228	676.46	338.42	321.	259.	0.130	41.35	1.677s
PB-214	703.74	352.06	219.	355.	0.178	23.37	1.500s
SB-125	926.05	463.23	150.	50.	0.025	105.73	1.500s
BE-7	955.54	477.97	151.	156.	0.078	50.78	2.389s
TL-208	1020.74	510.57	170.	161.	0.080	38.73	2.371s
TL-208	1166.43	583.42	97.	371.	0.186	20.80	1.619s
BI-214	1218.82	609.62	174.	324.	0.162	29.47	2.127s
CS-137	1323.55	661.98	180.	159.	0.079	56.71	1.394s
BI-212	1451.69	726.06	87.	144.	0.072	44.03	1.200s
AC-228	1822.37	911.40	119.	302.	0.151	27.29	2.415s
AC-228	1935.48	967.96	130.	240.	0.120	36.82	2.167s
BI-214	2240.66	1120.55	126.	112.	0.056	71.22	2.409s
K-40	2921.84	1461.12	31.	1352.	0.676	8.54	2.769s
BI-214	3529.97	1765.16	5.	60.	0.030	42.39	1.003s

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	MDA Value pCi/gm	COMMENTS
BE-7		7.3027E-01					
			477.56	7.303E-01	*(	2.802E-01 1.24E-01	G
K-40		1.3810E+01					
			1460.75	1.381E+01	*(P	2.906E-01 3.95E-01	G
MN-54		-1.8996E-04					
			834.81	-1.900E-04	&(P	3.085E-02 8.74E-03	G
CO-57		2.5786E-03					
			122.07	2.579E-03	&(P	3.714E-02 1.11E-02	G K
			136.43	8.375E-02	% P	2.926E-01 8.80E-02	G
CO-60		2.1346E-02					
			1332.51	2.135E-02	%(P	3.277E-02 1.00E-02	G K
			1173.23	2.243E-02	% P	4.524E-02 1.36E-02	G K
Sr-85		-2.1693E-02					
			514.00	-2.169E-02	%(	3.720E-02 1.14E-02	G
Kr-85		-5.2503E+02					
			513.99	-5.250E+02	%(P	8.460E+02 2.57E+02	G
Y-88		6.3132E-04					
			1836.01	6.313E-04	%(P	2.547E-02 6.59E-03	G K
			898.02	7.349E-03	% P	2.938E-02 8.54E-03	G
NB-94		8.2903E-04					
			871.10	8.290E-04	&(P	2.340E-02 6.53E-03	G K
			702.50	3.214E-04	& P	2.857E-02 8.15E-03	G K
Ag-108M		2.6973E-03					
			722.95	2.697E-03	&(	3.037E-02 8.74E-03	G K
			614.37	-1.439E-02	%	4.124E-02 1.24E-02	G
			433.93	-3.909E-03	% P	2.896E-02 8.43E-03	G
CD-109		-3.1718E-01					
			88.04	-3.172E-01	&(P	1.267E+00 3.82E-01	G
SN-113		-5.7512E-03					
			391.71	-5.751E-03	%(P	4.343E-02 1.27E-02	G K
			255.04	-1.546E-01	%	1.384E+00 4.11E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	5.6680E-02						
		427.95	-1.763E-03	%(P	9.046E-02	2.62E-02	G K
		600.77	-3.131E-02	% P	1.389E-01	4.04E-02	G
		636.15	2.092E-02	% P	2.291E-01	6.59E-02	G
		463.51	2.297E-01	*(P	2.743E-01	8.55E-02	G
		176.29	-4.613E-02	& P	4.682E-01	1.39E-01	G
I-131	8.4676E-03						
		364.48	8.468E-03	%(	3.419E-02	1.02E-02	G K
		636.97	5.877E-02	%	3.872E-01	1.12E-01	G
		284.29	9.586E-02	%	5.099E-01	1.52E-01	G
CS-134	-3.5035E-03						
		604.66	-3.503E-03	&(P	6.140E-02	1.82E-02	G K
		795.76	-4.322E-04	% P	4.126E-02	1.18E-02	G
		569.29	-5.094E-03	%	1.675E-01	4.81E-02	G
		801.84	9.273E-02	% P	3.249E-01	9.59E-02	G
CS-137	1.1362E-01						
		661.62	1.136E-01	@(P	4.675E-02	2.20E-02	G
CE-139	-5.5162E-03						
		165.85	-5.516E-03	%(P	3.836E-02	1.15E-02	G
EU-152	3.2642E-02						
		121.78	3.264E-02	&(P	1.025E-01	3.09E-02	G K
		344.30	-1.915E-03	% P	9.987E-02	2.92E-02	G
		1408.08	2.026E-02	% P	1.297E-01	3.64E-02	G
		964.00	1.888E-03	& P	3.805E-01	1.11E-01	G
		1112.07	3.270E-02	% P	2.662E-01	7.66E-02	G
		778.90	-3.246E-02	% P	2.465E-01	7.14E-02	G
EU-154	-2.4040E-02						
		123.10	-2.404E-02	%(P	7.798E-02	2.35E-02	G K
		1274.80	7.092E-03	% P	1.195E-01	3.42E-02	G
		723.30	-2.700E-02	& P	1.637E-01	4.77E-02	G
		1004.80	6.883E-05	% P	1.570E-01	4.37E-02	G
EU-155	5.5967E-02						
		86.45	5.597E-02	%(	1.377E-01	4.17E-02	G K
		105.31	2.032E-02	% P	1.193E-01	3.56E-02	G
HG-203	-3.0188E-03						
		279.17	-3.019E-03	%(P	2.472E-02	7.22E-03	G K
		72.87	-1.797E-01	% P	9.707E-01	2.92E-01	G
		70.83	-1.524E-01	&	1.736E+00	5.20E-01	G
		82.50	-3.721E-01	%	1.930E+00	5.79E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	2.3729E-01						
		583.14	2.373E-01	*(P	3.098E-02	1.67E-02	G
		510.72	3.541E-01	+ P	1.396E-01	5.53E-02	G
PB-212	5.6359E-01						
		238.63	5.636E-01	*(P	9.189E-02	3.33E-02	G K
							Energy duplication
		77.11	3.457E-01	-	3.179E-01	9.82E-02	G
		74.81	2.432E-01	% P	6.420E-01	1.94E-01	G
PB-214	3.5327E-01						
		351.99	3.533E-01	*(P	7.125E-02	2.79E-02	G K
		295.22	2.941E-01	- P	1.473E-01	4.86E-02	G
							Energy duplication
		77.11	5.520E-01	+ P	5.208E-01	1.61E-01	G
		241.92	-1.841E-01	% P	6.453E-01	1.94E-01	G
BI-212	7.9421E-01						
		727.17	7.942E-01	*(P	2.549E-01	1.18E-01	G K
		1620.56	-2.470E-02	% P	8.202E-01	2.09E-01	G
		785.42	5.553E-01	% P	1.563E+00	4.65E-01	G
BI-214	4.1915E-01						
		609.32	3.997E-01	*(P	7.915E-02	3.98E-02	G K
		1764.51	4.754E-01	(P	1.050E-01	6.82E-02	G
		1120.28	6.668E-01	+ P	3.287E-01	1.60E-01	G
RA-224	8.6370E-02						
		241.00	8.637E-02	%(P	1.165E+00	3.48E-01	G
RA-226	1.5493E+00						
		185.99	1.549E+00	*(	7.969E-01	2.85E-01	G
AC-228	7.9425E-01						
		911.07	8.030E-01	*(P	1.423E-01	7.41E-02	G K
		968.90	1.108E+00	+ P	2.583E-01	1.37E-01	G
		338.40	7.730E-01	*(P	2.568E-01	1.08E-01	G
TH-227	1.9687E-03						
		236.00	1.969E-03	%(P	4.162E-01	1.24E-01	G K
		256.25	-3.760E-02	% P	4.009E-01	1.18E-01	G
PA-234	-3.6809E-02						
		98.44	-3.681E-02	&(	1.299E-01	3.91E-02	G K
		946.00	-2.907E-02	%	1.646E-01	4.79E-02	G
		131.28	-3.137E-02	&	1.624E-01	4.87E-02	G
		94.67	-9.153E-02	%	2.528E-01	7.64E-02	G
		883.24	3.234E-02	%	2.138E-01	6.14E-02	G
		926.70	2.758E-02	%	2.293E-01	6.53E-02	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26-7.516E-03 %   2.480E-01 7.13E-02 G

TH-234       8.7979E-01
                           63.29 7.301E-01 %(P 1.656E+00 4.99E-01 G K
                           92.80 1.074E+00 *(P 1.383E+00 4.22E-01 G
                           92.38 9.880E-01 % P 1.663E+00 5.06E-01 G

AM-241      -4.8656E-02
                           59.54-4.866E-02 %(P 2.102E-01 6.31E-02 G
   ( - This peak used in the nuclide activity average.

   * - Peak is too wide, but only one peak in library.
   ! - Peak is part of a multiplet and this area went
       negative during deconvolution.
   ? - Peak is too narrow.
   @ - Peak is too wide at FW25M, but ok at FWHM.
   % - Peak fails sensitivity test.
   $ - Peak identified, but first peak of this nuclide
       failed one or more qualification tests.
   + - Peak activity higher than counting uncertainty range.
   - - Peak activity lower than counting uncertainty range.
   = - Peak outside analysis energy range.
   & - Calculated peak centroid is not close enough to the
       library energy centroid for positive identification.
   P - Peakbackground subtraction
   } - Peak is too close to another for the activity
       to be found directly.

   Nuclide Codes:                      Peak Codes:
   T - Thermal Neutron Activation      G - Gamma Ray
   F - Fast Neutron Activation         X - X-Ray
   I - Fission Product                 P - Positron Decay
   N - Naturally Occurring Isotope     S - Single-Escape
   P - Photon Reaction                 D - Double-Escape
   C - Charged Particle Reaction       K - Key Line
   M - No MDA Calculation              A - Not in Average
   R - Coincidence Corrected           C - Coincidence Peak
   H - Halflife limit exceeded

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
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***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#	7.1171E-01	7.3027E-01	3.7084E-01	3.7334E-01	
K-40	#	1.3810E+01	1.3810E+01	1.1840E+00	1.4378E+00	
MN-54	#A	-1.8912E-04	-1.8996E-04	1.0836E-01	1.0836E-01	3.071E-02
CO-57	#B	2.5655E-03	2.5786E-03	3.3226E-02	3.3226E-02	3.695E-02
CO-60	#B	2.1331E-02	2.1346E-02	3.0121E-02	3.0147E-02	3.275E-02

Sr-85	#A	-2.1237E-02	-2.1693E-02	3.4101E-02	3.4125E-02	3.642E-02
Kr-85	#A	-5.2502E+02	-5.2503E+02	8.7948E+02	8.8003E+02	8.460E+02
Y-88	#B	6.2323E-04	6.3132E-04	1.9778E-02	1.9778E-02	2.515E-02
NB-94	#B	8.2903E-04	8.2903E-04	1.9587E-02	1.9587E-02	2.340E-02
Ag-108M	#B	2.6972E-03	2.6973E-03	2.6218E-02	2.6219E-02	3.037E-02
CD-109	#A	-3.1622E-01	-3.1718E-01	1.1612E+00	1.1614E+00	1.263E+00
SN-113	#B	-5.6829E-03	-5.7512E-03	5.7165E-02	5.7166E-02	4.292E-02
SB-125	#B	5.6603E-02	5.6680E-02	6.3297E-02	6.3385E-02	9.034E-02
I-131	#B	7.1364E-03	8.4676E-03	3.0466E-02	3.0470E-02	2.882E-02
CS-134	#B	-3.4971E-03	-3.5035E-03	6.4966E-02	6.4966E-02	6.129E-02
CS-137	#	1.1360E-01	1.1362E-01	6.5867E-02	6.6208E-02	
CE-139	#A	-5.4613E-03	-5.5162E-03	3.5696E-02	3.5698E-02	3.798E-02
EU-152	#B	3.2632E-02	3.2642E-02	9.2632E-02	9.2649E-02	1.025E-01
EU-154	#B	-2.4029E-02	-2.4040E-02	7.2290E-02	7.2302E-02	7.794E-02
EU-155	#B	5.5925E-02	5.5967E-02	1.2501E-01	1.2505E-01	1.376E-01
HG-203	#B	-2.9310E-03	-3.0188E-03	3.0433E-02	3.0434E-02	2.400E-02
TL-208	#	2.3729E-01	2.3729E-01	4.9960E-02	5.1888E-02	
PB-212	#	5.6359E-01	5.6359E-01	9.9874E-02	1.0528E-01	9.189E-02
PB-214	#	3.5327E-01	3.5327E-01	8.3739E-02	8.6299E-02	7.125E-02
BI-212	#	7.9421E-01	7.9421E-01	3.5280E-01	3.5590E-01	
BI-214		4.1915E-01	4.1915E-01	1.0977E-01	1.1253E-01	
RA-224	#A	8.6370E-02	8.6370E-02	1.0452E+00	1.0452E+00	1.165E+00
RA-226	#	1.5493E+00	1.5493E+00	8.5439E-01	8.5928E-01	
AC-228	#	7.9425E-01	7.9425E-01	1.9929E-01	2.0474E-01	
TH-227	#B	1.9687E-03	1.9687E-03	3.7286E-01	3.7286E-01	4.162E-01
PA-234	#B	-3.6809E-02	-3.6809E-02	1.1718E-01	1.1720E-01	1.299E-01
TH-234	#B	8.7979E-01	8.7979E-01	1.0368E+00	1.0379E+00	1.656E+00
AM-241	#A	-4.8656E-02	-4.8656E-02	1.9701E-01	1.9703E-01	2.102E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (92.2 to 2000.1 keV) 1.8429768E+01 pCi/gm
Total Decayed Activity (92.2 to 2000.1 keV) 1.8448351E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JPK

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 107F_24AUG2006_0914.An1

Sample description
FSS-OOL-05-04-089-F-I

Spectrum Filename: C:\GammaVision\Spectra\107F_24AUG2006_0914.An1

Acquisition information
Start time: 24-Aug-2006 09:14:30
Live time: 2000
Real time: 2003
Dead time: 0.14 %
Detector ID: 2

Detector system
Det 107- DSPE- 634

Calibration
Filename: D7_1LSa.Clb
Detector 107 Calibration for 1 Liter Sand Marinelli

Energy Calibration
Created: 29-Oct-2004 06:48:53
Zero offset: 0.157 keV
Gain: 0.500 keV/channel
Quadratic: -1.676E-08 keV/channel^2

Efficiency Calibration
Created: 29-Oct-2004 06:51:32
Type: Polynomial
Uncertainty: 1.174 %
Coefficients: -0.279532 -4.778179 0.614896
-0.087174 0.005356 -0.000131

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.16keV)
Stop channel: 4000 (2000.15keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 1.8700E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.8700E+03) =
5.3476E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	23-Aug-2006 16:20:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	107_150K_28APR05.Pbc 01-May-2005 05:30:33
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 19 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.7725

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
74.66	329.	15.13	1.18	2.837E-02	74.81	9.600	8.597E-01	PB212
76.97	577.	9.33	1.18	2.947E-02	77.11	17.500	8.056E-01	PB212
					77.11	10.700	1.307E+00	PB214
87.36	232.	19.65	1.19	3.310E-02	86.45	32.740	1.560E-01	EU155
					88.04	3.790	1.329E+00	CD109
89.85	228.	19.97	1.19	3.373E-02				
89.85	228.	19.97	1.19	3.373E-02	92.38	2.570	1.803E+00	TH234
93.29	285.	14.54	1.19	3.450E-02	92.80	3.000	1.858E+00	TH234
186.08	266.	17.53	2.32	3.610E-02	185.99	3.280	1.620E+00	RA226
209.08	237.	20.58	2.39	3.430E-02				
239.09	2332.	3.42	1.68	3.186E-02	238.63	43.100	1.218E+00	PB212
242.07	206.	20.17	1.30	3.163E-02	241.00	3.900	1.206E+00	RA224
					241.92	7.470	6.311E-01	PB214
270.59	178.	22.37	1.35	2.942E-02				
278.15	105.	31.39	1.32	2.887E-02	279.17	81.500	3.215E-02	HG203
295.17	294.	13.13	1.55	2.768E-02	295.22	19.200	3.941E-01	PB214
300.90	148.	21.92	1.24	2.730E-02				
338.78	500.	8.93	1.63	2.498E-02	338.40	12.010	1.195E+00	AC228
351.86	611.	8.31	1.65	2.427E-02	351.99	37.100	4.865E-01	PB214
409.44	95.	33.68	0.86	2.155E-02				
463.81	148.	20.73	1.72	1.952E-02	463.51	10.000	5.361E-01	SB125
511.01	287.	10.17	2.38	1.807E-02	510.72	22.500	4.506E-01	TL208
583.26	712.	5.34	1.76	1.629E-02	583.14	86.000	3.649E-01	TL208
609.46	413.	7.24	1.74	1.574E-02	609.32	46.090	4.070E-01	BI214
727.39	153.	13.97	2.03	1.374E-02	727.17	11.800	6.752E-01	BI212
794.87	119.	22.52	1.83	1.285E-02				
794.87	119.	22.52	1.83	1.285E-02	795.76	85.400	7.813E-02	CS134

861.33	120.	18.73	1.58	1.210E-02				
911.30	480.	5.60	1.91	1.161E-02	911.07	29.000	1.020E+00	AC228
964.83	84.	18.72	1.80	1.113E-02				
969.15	258.	8.09	1.80	1.109E-02	968.90	17.460	9.530E-01	AC228
1120.42	85.	20.19	1.90	9.970E-03	1120.28	15.040	4.102E-01	BI214
1460.81	1957.	2.36	2.29	8.191E-03	1460.75	10.700	1.610E+01	K40
1621.39	25.	32.40	2.06	7.569E-03	1620.56	2.750	8.783E-01	BI212

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
1764.54	55.	16.46	2.29	7.084E-03	1764.51	15.920	3.540E-01	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
174.38	87.42	923.	232.	0.116	58.95	1.187	PB-214	D
179.37	89.92	922.	228.	0.114	59.92	1.189	PB-214	D
186.25	93.36	715.	285.	0.142	43.61	1.191	U-235	D
417.80	209.08	792.	237.	0.118	61.75	2.392	AC-228	s
540.81	270.59	500.	178.	0.089	67.12	1.345	AC-228	s
601.42	300.90	364.	148.	0.074	65.77	1.235	PB-212	s
818.49	409.44	298.	95.	0.047	101.03	0.864	AC-228	s
1675.08	837.76	122.	98.	0.049	70.59	1.872	J-135	l
1722.22	861.33	110.	120.	0.060	46.11	1.582	TL-208	s
1929.48	964.72	78.	86.	0.043	54.57	1.796	AC-228	D

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-212	149.29	74.81	1080.	326.	0.163	45.35	1.178D
PB-212	153.89	77.11	1049.	381.	0.191	32.12	1.179A
PB-214	153.89	77.11	1774.	186.	0.093	89.06	1.500A
EU-155	174.26	87.30	1997.	171.	0.085	113.48	1.500s
TH-234	186.17	93.25	1780.	219.	0.110	76.99	1.500s
RA-226	371.79	186.08	760.	266.	0.133	52.60	2.322s
TH-227	471.68	236.02	1908.	-246.	-0.123	77.71	1.500s
PB-212	476.89	238.63	612.	1714.	0.857	9.37	1.297D
PB-214	483.47	241.92	776.	206.	0.103	60.50	1.299D
HG-203	555.92	278.15	376.	103.	0.052	94.17	1.319
PB-214	589.96	295.17	448.	290.	0.145	39.38	1.553s
AC-228	677.18	338.78	442.	497.	0.248	26.80	1.629s
PB-214	703.34	351.86	497.	606.	0.303	24.93	1.645s
SB-125	925.34	462.87	223.	86.	0.043	77.40	1.500s
TL-208	1021.60	511.01	216.	254.	0.127	30.51	2.382s
TL-208	1166.10	583.26	221.	707.	0.354	16.02	1.758s
BI-214	1218.31	609.37	185.	361.	0.181	22.13	1.558s
BI-212	1454.36	727.39	113.	152.	0.076	41.91	2.027s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
CS-134	1589.59	795.01	117.	80.	0.040	65.72	1.684s
AC-228	1822.16	911.30	91.	475.	0.238	16.80	1.913s
AC-228	1937.36	968.90	111.	255.	0.128	25.35	1.799D
BI-214	2240.41	1120.42	109.	85.	0.043	60.58	1.897s
K-40	2921.21	1460.81	43.	1952.	0.976	7.09	2.290s
BI-212	3242.39	1621.39	16.	25.	0.013	97.20	2.064s
BI-214	3528.73	1764.54	16.	55.	0.028	49.39	2.291

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	Peak MDA Value pCi/gm	COMMENTS
BE-7		9.6068E-02					
			477.56	9.607E-02	%(	2.824E-01 8.48E-02	G
K-40		1.6097E+01					
			1460.75	1.610E+01	(P	2.735E-01 3.81E-01	G
MN-54		2.5869E-03					
			834.81	2.587E-03	&(P	4.140E-02 1.21E-02	G
CO-57		-1.3576E-03					
			122.07	-1.358E-03	&(P	2.821E-02 8.39E-03	G K
			136.43	3.420E-04	& P	2.242E-01 6.66E-02	G
CO-60		-1.6457E-03					
			1332.51	-1.646E-03	&(P	3.410E-02 9.47E-03	G K
			1173.23	-3.911E-03	% P	4.518E-02 1.29E-02	G K
Sr-85		-2.6844E-02					
			514.00	-2.684E-02	%(	3.849E-02 1.18E-02	G
Kr-85		-6.4303E+02					
			513.99	-6.430E+02	%(P	8.853E+02 2.71E+02	G
Y-88		4.1013E-03					
			1836.01	4.101E-03	%(P	1.892E-02 5.21E-03	G K
			898.02	-1.016E-02	% P	3.368E-02 9.92E-03	G
NB-94		2.7423E-03					
			871.10	2.742E-03	%(P	2.831E-02 8.19E-03	G K
			702.50	3.639E-04	% P	2.586E-02 7.43E-03	G K

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
Ag-108M	-3.9467E-04						
		722.95	-3.947E-04	%(	3.889E-02	1.13E-02	G K
		614.37	-1.271E-02	%	3.557E-02	1.07E-02	G
		433.93	-2.783E-04	& P	2.747E-02	7.99E-03	G
CD-109	8.0243E-01						
		88.04	8.024E-01	%(P	1.131E+00	3.45E-01	G
SN-113	5.3626E-03						
		391.71	5.363E-03	&(P	3.929E-02	1.16E-02	G K
		255.04	-6.324E-02	&	1.341E+00	3.99E-01	G
SB-125	9.4869E-02						
		427.95	1.878E-02	%(P	8.480E-02	2.52E-02	G K
		600.77	-3.747E-02	% P	1.525E-01	4.50E-02	G
		636.15	-4.374E-03	& P	2.349E-01	6.77E-02	G
		463.51	3.201E-01	*(P	2.679E-01	8.53E-02	G
		176.29	1.326E-03	% P	4.352E-01	1.29E-01	G
I-131	-1.7689E-03						
		364.48	-1.769E-03	&(	3.135E-02	9.22E-03	G K
		636.97	-5.395E-02	&	4.753E-01	1.40E-01	G
		284.29	6.238E-02	%	4.655E-01	1.39E-01	G
CS-134	2.5669E-02						
		604.66	1.850E-03	&(P	2.557E-02	7.43E-03	G K
		795.76	5.289E-02	(P	3.496E-02	1.17E-02	G
		569.29	-3.866E-02	%	1.772E-01	5.25E-02	G
		801.84	5.915E-02	& P	3.414E-01	1.00E-01	G
CS-137	4.7511E-03						
		661.62	4.751E-03	%(P	3.327E-02	9.70E-03	G
CE-139	1.0707E-02						
		165.85	1.071E-02	%(P	3.664E-02	1.10E-02	G
EU-152	-2.0956E-02						
		121.78	-2.096E-02	%(P	1.177E-01	3.54E-02	G K
		344.30	-4.345E-02	% P	1.083E-01	3.27E-02	G
		1408.08	5.385E-02	% P	1.291E-01	3.86E-02	G
		964.00	-7.495E-02	% P	3.013E-01	8.96E-02	G
		1112.07	6.110E-02	% P	2.465E-01	7.26E-02	G
		778.90	-6.367E-02	% P	2.484E-01	7.36E-02	G
EU-154	1.1412E-03						
		123.10	1.141E-03	&(P	7.829E-02	2.34E-02	G K
		1274.80	-6.697E-04	& P	1.044E-01	2.98E-02	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          723.30-9.620E-02 % P 2.140E-01 6.47E-02 G
                         1004.80-2.325E-02 & P 1.731E-01 5.02E-02 G

EU-155       1.1470E-01
                           86.45 1.147E-01  (  1.418E-01 4.34E-02 G K
                          105.31 3.651E-02 & P 1.495E-01 4.50E-02 G

HG-203       3.2148E-02
                          279.17 3.215E-02  (P 2.895E-02 1.02E-02 G K
                           72.87-3.217E-02 % P 1.039E+00 3.12E-01 G
                           70.83-9.667E-01 %   1.748E+00 5.31E-01 G
                           82.50-7.273E-01 &   2.092E+00 6.32E-01 G

TL-208       3.6493E-01
                          583.14 3.649E-01 *(P 3.710E-02 1.96E-02 G
                          510.72 4.506E-01 + P 1.266E-01 5.19E-02 G

PB-212       8.7159E-01
                          238.63 9.012E-01  (P 6.202E-02 2.84E-02 G K
                                                          Energy duplication
                           77.11 5.327E-01 }   2.145E-01 5.70E-02 G
                           74.81 8.605E-01  (P 4.118E-01 1.32E-01 G

PB-214       4.8650E-01
                          351.99 4.865E-01 *(P 8.560E-02 4.08E-02 G K
                          295.22 3.941E-01 - P 1.379E-01 5.25E-02 G
                                                          Energy duplication
                           77.11 4.258E-01 } P 4.544E-01 1.26E-01 G
                          241.92 6.311E-01 + P 4.052E-01 1.28E-01 G

BI-212       7.1357E-01
                          727.17 6.752E-01  (P 2.333E-01 9.52E-02 G K
                         1620.56 8.783E-01 *(P 7.352E-01 2.90E-01 G
                          785.42 3.220E-01 % P 1.664E+00 4.90E-01 G

BI-214       3.6831E-01
                          609.32 3.596E-01 @(P 6.579E-02 2.68E-02 G K
                         1764.51 3.540E-01  (P 1.350E-01 5.92E-02 G
                         1120.28 4.102E-01  (P 2.472E-01 8.37E-02 G

RA-224       4.7171E-01
                          241.00 4.717E-01 %(P 1.096E+00 3.32E-01 G

RA-226       1.6203E+00
                          185.99 1.620E+00 *(  8.008E-01 2.84E-01 G

AC-228       9.9518E-01
                          911.07 1.020E+00  (P 1.011E-01 5.77E-02 G K
                          968.90 9.532E-01  (P 1.929E-01 8.13E-02 G
                          338.40 1.195E+00 + P 2.424E-01 1.07E-01 G
```

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 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments

TH-227      -4.9496E-01
                          236.00-4.950E-01 ?(P 4.145E-01 1.28E-01 G K
                          256.25 6.971E-03 % P 4.129E-01 1.22E-01 G

PA-234       2.3121E-03
                           98.44 2.312E-03 %(  1.235E-01 3.68E-02 G K
                          946.00 4.236E-02 %   1.530E-01 4.53E-02 G
                          131.28-1.628E-02 &   1.632E-01 4.89E-02 G
                           94.67-7.859E-02 %   2.225E-01 6.72E-02 G
                          883.24 2.364E-04 %   1.899E-01 5.35E-02 G
                          926.70-1.373E-02 &   2.202E-01 6.28E-02 G
                          569.26-5.722E-02 %   2.627E-01 7.78E-02 G

TH-234       8.6013E-01
                           63.29 3.404E-01 %(P 1.772E+00 5.32E-01 G K
                           92.80 1.536E+00 *(P 1.397E+00 4.30E-01 G
                           92.38 2.826E-01 % P 1.523E+00 4.58E-01 G

AM-241       8.2074E-02
                           59.54 8.207E-02 %(P 2.112E-01 6.39E-02 G
   ( - This peak used in the nuclide activity average.

   * - Peak is too wide, but only one peak in library.
   ! - Peak is part of a multiplet and this area went
       negative during deconvolution.
   ? - Peak is too narrow.
   @ - Peak is too wide at FW25M, but ok at FWHM.
   % - Peak fails sensitivity test.
   $ - Peak identified, but first peak of this nuclide
       failed one or more qualification tests.
   + - Peak activity higher than counting uncertainty range.
   - - Peak activity lower than counting uncertainty range.
   = - Peak outside analysis energy range.
   & - Calculated peak centroid is not close enough to the
       library energy centroid for positive identification.
   P - Peakbackground subtraction
   } - Peak is too close to another for the activity
       to be found directly.

   Nuclide Codes:                      Peak Codes:
   T - Thermal Neutron Activation      G - Gamma Ray
   F - Fast Neutron Activation         X - X-Ray
   I - Fission Product                 P - Positron Decay
   N - Naturally Occurring Isotope     S - Single-Escape
   P - Photon Reaction                 D - Double-Escape
   C - Charged Particle Reaction       K - Key Line
   M - No MDA Calculation              A - Not in Average
```

R - Coincidence Corrected C - Coincidence Peak
H - Halflife limit exceeded

- -

***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	9.5194E-02	9.6068E-02	2.5432E-01	2.5438E-01	2.798E-01
K-40	#	1.6097E+01	1.6097E+01	1.1441E+00	1.4876E+00	
MN-54	#A	2.5828E-03	2.5869E-03	3.6422E-02	3.6422E-02	4.134E-02
CO-57	#B	-1.3551E-03	-1.3576E-03	2.7565E-02	2.7565E-02	2.815E-02
CO-60	#B	-1.6452E-03	-1.6457E-03	9.2655E-02	9.2655E-02	3.409E-02
Sr-85	#A	-2.6642E-02	-2.6844E-02	3.5456E-02	3.5492E-02	3.820E-02
Kr-85	#A	-6.4303E+02	-6.4303E+02	8.8623E+02	8.8704E+02	8.853E+02
Y-88	#B	4.0826E-03	4.1013E-03	1.5621E-02	1.5623E-02	1.883E-02
NB-94	#B	2.7423E-03	2.7423E-03	2.4582E-02	2.4583E-02	2.831E-02
Ag-108M	#B	-3.9467E-04	-3.9467E-04	3.4006E-02	3.4006E-02	3.889E-02
CD-109	#A	8.0157E-01	8.0243E-01	1.0355E+00	1.0365E+00	1.130E+00
SN-113	#B	5.3399E-03	5.3626E-03	3.4809E-02	3.4810E-02	3.912E-02
SB-125	#F	9.4823E-02	9.4869E-02	7.5819E-02	7.6026E-02	8.476E-02
I-131	#B	-1.6647E-03	-1.7689E-03	2.7674E-02	2.7675E-02	2.951E-02
CS-134	#F	2.5653E-02	2.5669E-02	1.6980E-02	1.7048E-02	2.556E-02
CS-137	#A	4.7509E-03	4.7511E-03	2.9108E-02	2.9110E-02	3.327E-02
CE-139	#A	1.0669E-02	1.0707E-02	3.3114E-02	3.3120E-02	3.651E-02
EU-152	#B	-2.0953E-02	-2.0956E-02	1.0703E-01	1.0703E-01	1.177E-01
EU-154	#B	1.1410E-03	1.1412E-03	7.0141E-02	7.0141E-02	7.827E-02
EU-155	#A	1.1467E-01	1.1470E-01	1.3016E-01	1.3031E-01	1.418E-01
HG-203		3.1812E-02	3.2148E-02	3.0653E-02	3.0711E-02	
TL-208	#	3.6493E-01	3.6493E-01	5.8854E-02	6.2676E-02	
PB-212		8.7159E-01	8.7159E-01	8.2453E-02	9.7202E-02	
PB-214		4.8650E-01	4.8650E-01	1.2233E-01	1.2566E-01	
BI-212	#	7.1357E-01	7.1357E-01	3.0162E-01	3.0455E-01	
BI-214	#	3.6831E-01	3.6831E-01	8.2480E-02	8.5300E-02	6.579E-02
RA-224	#A	4.7171E-01	4.7171E-01	9.9519E-01	9.9558E-01	1.096E+00
RA-226	#	1.6203E+00	1.6203E+00	8.5222E-01	8.5758E-01	
AC-228		9.9518E-01	9.9518E-01	1.5268E-01	1.6360E-01	
TH-227	#A	-4.9496E-01	-4.9496E-01	3.8507E-01	3.8618E-01	4.145E-01
PA-234	#B	2.3121E-03	2.3121E-03	1.1050E-01	1.1050E-01	1.235E-01
TH-234	#B	8.6013E-01	8.6013E-01	7.2180E-01	7.2338E-01	1.772E+00
AM-241	#A	8.2074E-02	8.2074E-02	1.9156E-01	1.9162E-01	2.112E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.

H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (1460.7 to 2000.1 keV) 2.1180986E+01 pCi/gm
Total Decayed Activity (1460.7 to 2000.1 keV) 2.1181322E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JPK

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 101F_25JUL2006_1654.An1

Sample description
FSS-OOL-05-05-021-F-B WET

Spectrum Filename: C:\GammaVision\Spectra\101F_25JUL2006_1654.An1

Acquisition information
Start time: 25-Jul-2006 16:54:31
Live time: 2000
Real time: 2001
Dead time: 0.06 %
Detector ID: 1

Detector system
Det 101- DSPE-633

Calibration
Filename: D1_1LSa.Clb
Detector 101 1.0 Liter Marinelli Sand

Energy Calibration
Created: 03-Sep-2004 08:50:48
Zero offset: 0.244 keV
Gain: 0.500 keV/channel
Quadratic: -2.493E-08 keV/channel^2

Efficiency Calibration
Created: 03-Sep-2004 08:52:26
Type: Polynomial
Uncertainty: 0.626 %
Coefficients: -0.321775 -5.816463 0.734234
-0.099357 0.006049 -0.000149

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.23keV)
Stop channel: 4000 (1999.11keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 1.6850E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.6850E+03) =
5.9347E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	25-Jul-2006 13:00:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	101_150K_28APR05.Pbc 01-May-2005 05:24:47
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 8 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.4948

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
74.89	102.	31.93	1.50	1.654E-02	70.83	3.520	1.546E+00	HG203
					74.81	9.600	PBC<MDA	PB212
77.21	152.	21.48	1.50	1.720E-02	77.11	10.700	6.631E-01	PB214
					77.11	17.500	PBC<MDA	PB212
77.21	156.	21.48	1.50	1.720E-02	77.11	10.700	6.631E-01	PB214
					77.11	17.500	4.153E-01	PB212
87.07	81.	39.69	1.50	1.910E-02	86.45	32.740	PBC<MDA	EU155
					88.04	3.790	PBC<MDA	CD109
92.37	80.	37.23	1.53	1.985E-02				
92.37	80.	37.23	1.53	1.985E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
186.15	66.	37.83	0.85	1.857E-02	185.99	3.280	8.711E-01	RA226
239.05	362.	6.53	1.12	1.555E-02	238.63	43.100	4.257E-01	PB212
242.18	63.	26.85	1.12	1.539E-02	241.00	3.900	PBC<MDA	RA224
					241.92	7.470	PBC<MDA	PB214
295.33	98.	22.11	1.34	1.292E-02	295.22	19.200	3.098E-01	PB214
338.74	86.	25.39	1.21	1.134E-02	338.40	12.010	4.955E-01	AC228
352.33	161.	11.68	1.00	1.091E-02	351.99	37.100	3.139E-01	PB214
463.37	28.	36.03	0.87	8.344E-03				
463.37	28.	36.03	0.87	8.344E-03	463.51	10.000	PBC<MDA	SB125
511.32	14.	36.75	1.50	7.590E-03	510.72	22.500	PBC<MDA	TL208
583.48	109.	13.29	1.26	6.681E-03	583.14	86.000	1.482E-01	TL208
609.91	117.	12.35	1.56	6.407E-03	609.32	46.090	3.134E-01	BI214
795.59	22.	39.50	1.50	5.016E-03	795.76	85.400	PBC<MDA	CS134
911.60	83.	12.97	1.70	4.444E-03	911.07	29.000	5.058E-01	AC228
969.81	68.	18.96	2.08	4.209E-03	968.90	17.460	7.283E-01	AC228
1120.85	42.	40.05	1.07	3.711E-03	1120.28	15.040	6.009E-01	BI214

1462.02	402.	5.13	1.80	2.940E-03	1460.75	10.700	1.018E+01	K40

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
1765.69	19.	22.94	0.83	2.481E-03	1764.51	15.920	3.768E-01	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
184.32	92.37	351.	80.	0.040	111.70	1.529	PB-214	l
477.79	239.02	99.	362.	0.181	19.60	1.122	PB-212	D
484.06	242.15	110.	63.	0.031	80.56	1.124	PB-214	D
926.64	463.37	32.	28.	0.014	108.09	0.868	SB-125	l

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-212	149.35	74.89	542.	102.	0.051	95.79	1.499
PB-214	153.79	77.11	486.	152.	0.076	64.43	1.499D
PB-212	153.79	77.11	483.	156.	0.078	64.43	1.499D
EU-155	173.72	87.07	478.	81.	0.041	119.08	1.499s
RA-226	372.33	186.34	282.	66.	0.033	114.84	1.499
PB-212	477.68	238.99	270.	282.	0.141	29.76	1.499
PB-214	590.95	295.60	129.	88.	0.044	61.77	1.499
AC-228	677.09	338.65	78.	73.	0.037	59.97	1.499s
PB-214	704.61	352.41	63.	141.	0.070	34.12	1.499
TL-208	1167.37	583.68	38.	103.	0.052	37.71	1.499s
BI-214	1219.85	609.91	34.	115.	0.058	37.05	1.560
CS-134	1591.40	795.59	29.	22.	0.011	118.50	1.502s
AC-228	1824.34	911.99	16.	66.	0.033	43.32	1.578s
AC-228	1940.51	970.05	28.	41.	0.021	70.46	1.616s
BI-214	2242.29	1120.85	52.	42.	0.021	120.15	1.065s
K-40	2925.06	1462.02	9.	400.	0.200	15.38	1.802
BI-214	3532.82	1765.69	0.	19.	0.009	68.82	0.833s

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Code	MDA Value pCi/gm	COMMENTS
BE-7		1.1989E-01					
			477.56	1.199E-01	%(	2.622E-01	7.93E-02 G
K-40		1.0184E+01					
			1460.75	1.018E+01	(P	4.287E-01	5.25E-01 G
MN-54		-1.3258E-03					
			834.81	-1.326E-03	&(P	4.534E-02	1.23E-02 G
CO-57		8.2278E-03					
			122.07	8.228E-03	%(	4.110E-02	1.23E-02 G K
			136.43	-6.712E-02	%	2.942E-01	8.77E-02 G
CO-60		8.4458E-03					
			1332.51	8.446E-03	&(P	5.800E-02	1.62E-02 G K
			1173.23	1.912E-02	& P	5.645E-02	1.66E-02 G K
Sr-85		-6.9294E-03					
			514.00	-6.929E-03	%(	4.578E-02	1.33E-02 G
Kr-85		-1.8872E+02					
			513.99	-1.887E+02	%(P	1.063E+03	3.06E+02 G
Y-88		0.0000E+00					
			1836.01	0.000E+00	%(	2.490E-02	3.38E-03 G K
			898.02	6.512E-03	% P	4.126E-02	1.15E-02 G
NB-94		-2.3112E-04					
			871.10	-2.311E-04	%(P	4.175E-02	1.12E-02 G K
			702.50	9.168E-03	% P	3.594E-02	1.04E-02 G K
Ag-108M		1.1178E-02					
			722.95	1.118E-02	%(	4.589E-02	1.33E-02 G K
			614.37	-1.042E-02	% P	4.916E-02	1.43E-02 G
			433.93	2.645E-03	%	3.419E-02	9.69E-03 G
CD-109		-4.0113E-02					
			88.04	-4.011E-02	%(P	1.261E+00	3.74E-01 G
SN-113		-8.2894E-03					
			391.71	-8.289E-03	&(	4.922E-02	1.43E-02 G K
			255.04	4.527E-01	% P	1.418E+00	4.23E-01 G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	-9.0206E-03						
		427.95	-9.021E-03	&(P	1.061E-01	3.00E-02	G K
		600.77	-4.143E-02	% P	2.140E-01	6.15E-02	G
		636.15	2.325E-02	& P	2.804E-01	7.70E-02	G
		463.51	1.932E-01	% P	3.197E-01	9.83E-02	G
		176.29	-1.516E-02	% P	5.337E-01	1.56E-01	G
I-131	-1.1009E-02						
		364.48	-1.101E-02	%(	3.968E-02	1.17E-02	G K
		636.97	-1.038E-02	&	4.731E-01	1.29E-01	G
		284.29	-6.235E-02	%	5.514E-01	1.61E-01	G
CS-134	1.7007E-02						
		604.66	-4.673E-03	&(P	4.012E-02	1.13E-02	G K
		795.76	4.178E-02	*(P	5.236E-02	1.68E-02	G
		569.29	-2.971E-02	& P	2.845E-01	8.10E-02	G
		801.84	-4.654E-02	&	4.924E-01	1.37E-01	G
CS-137	1.4905E-02						
		661.62	1.490E-02	%(P	4.124E-02	1.21E-02	G
CE-139	-1.5592E-02						
		165.85	-1.559E-02	%(P	4.663E-02	1.40E-02	G
EU-152	2.2169E-02						
		121.78	2.217E-02	%(P	1.239E-01	3.69E-02	G K
		344.30	-1.579E-02	% P	1.233E-01	3.56E-02	G
		1408.08	3.572E-02	% P	2.133E-01	5.82E-02	G
		964.00	9.213E-02	% P	3.485E-01	1.01E-01	G
		1112.07	-9.645E-02	% P	4.425E-01	1.27E-01	G
		778.90	-3.311E-03	% P	3.427E-01	9.41E-02	G
EU-154	9.8780E-03						
		123.10	9.878E-03	%(P	8.671E-02	2.57E-02	G K
		1274.80	2.120E-02	& P	1.091E-01	3.00E-02	G
		723.30	7.983E-03	% P	2.411E-01	6.73E-02	G
		1004.80	-1.029E-03	& P	2.678E-01	7.20E-02	G
EU-155	1.0409E-01						
		86.45	1.041E-01	(	1.342E-01	4.13E-02	G K
		105.31	-1.797E-03	&	1.668E-01	4.92E-02	G
HG-203	1.2026E-02						
		279.17	1.203E-02	&(	3.699E-02	1.10E-02	G K
		72.87	-3.803E-01	% P	9.989E-01	3.01E-01	G
		70.83	-1.073E+00	%	1.684E+00	5.15E-01	G
		82.50	-2.874E-02	%	1.873E+00	5.53E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	1.4380E-01						
		583.14	1.438E-01	@(P	4.359E-02	1.85E-02	G
		510.72	6.699E-02	% P	1.862E-01	5.23E-02	G
PB-212	3.5931E-01						
		238.63	3.366E-01	(P	9.471E-02	3.41E-02	G K
							Energy duplication
		77.11	4.153E-01	(	2.799E-01	8.92E-02	G
		74.81	5.172E-01	& P	5.617E-01	1.74E-01	G
PB-214	2.8113E-01						
		351.99	2.789E-01	(P	7.835E-02	3.22E-02	G K
		295.22	2.853E-01	(P	1.796E-01	5.99E-02	G
							Energy duplication
		77.11	6.631E-01	+ P	4.595E-01	1.46E-01	G
		241.92	3.436E-01	% P	5.489E-01	1.68E-01	G
BI-212	4.8297E-03						
		727.17	4.830E-03	%(P	3.773E-01	1.04E-01	G K
		1620.56	0.000E+00	%	1.728E+00	4.35E-01	G
		785.42	-2.997E-02	% P	2.263E+00	6.20E-01	G
BI-214	3.2968E-01						
		609.32	3.134E-01	(P	8.055E-02	3.91E-02	G K
		1764.51	3.768E-01	(P	1.496E-01	8.85E-02	G
		1120.28	6.009E-01	+ P	5.227E-01	2.43E-01	G
RA-224	7.3534E-01						
		241.00	7.353E-01	%(P	1.069E+00	3.28E-01	G
RA-226	8.6314E-01						
		185.99	8.631E-01	(	1.066E+00	3.30E-01	G
AC-228	4.2552E-01						
		911.07	4.101E-01	@(P	1.324E-01	6.09E-02	G K
		968.90	4.478E-01	(P	2.984E-01	1.07E-01	G
		338.40	4.303E-01	@(P	2.579E-01	8.86E-02	G
TH-227	-1.8528E-01						
		236.00	-1.853E-01	%(P	4.295E-01	1.30E-01	G K
		256.25	1.293E-01	& P	4.253E-01	1.26E-01	G
PA-234	-8.1033E-03						
		98.44	-8.103E-03	&(	1.539E-01	4.56E-02	G K
		946.00	0.000E+00	%	1.978E-01	5.24E-02	G
		131.28	-6.366E-02	%	1.923E-01	5.79E-02	G
		94.67	-7.871E-02	%	2.885E-01	8.66E-02	G
		883.24	4.017E-02	&	3.318E-01	9.19E-02	G
		926.70	5.350E-03	&	4.279E-01	1.17E-01	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26-3.820E-02 &   4.202E-01 1.20E-01 G

TH-234       5.6833E-01
                           63.29 5.683E-01 %(P 1.709E+00 5.11E-01 G K
                           92.80 9.040E-01 % P 1.414E+00 4.31E-01 G
                           92.38 9.696E-01 % P 1.684E+00 5.11E-01 G

AM-241      -7.0656E-02
                           59.54-7.066E-02 %(P 2.554E-01 7.65E-02 G
```

(- This peak used in the nuclide activity average.

* - Peak is too wide, but only one peak in library.
! - Peak is part of a multiplet and this area went negative during deconvolution.
? - Peak is too narrow.
@ - Peak is too wide at FW25M, but ok at FWHM.
% - Peak fails sensitivity test.
$ - Peak identified, but first peak of this nuclide failed one or more qualification tests.
\+ - Peak activity higher than counting uncertainty range.
\- - Peak activity lower than counting uncertainty range.
= - Peak outside analysis energy range.
& - Calculated peak centroid is not close enough to the library energy centroid for positive identification.
P - Peakbackground subtraction
} - Peak is too close to another for the activity to be found directly.

Nuclide Codes:	Peak Codes:
T - Thermal Neutron Activation	G - Gamma Ray
F - Fast Neutron Activation	X - X-Ray
I - Fission Product	P - Positron Decay
N - Naturally Occurring Isotope	S - Single-Escape
P - Photon Reaction	D - Double-Escape
C - Charged Particle Reaction	K - Key Line
M - No MDA Calculation	A - Not in Average
R - Coincidence Corrected	C - Coincidence Peak
H - Halflife limit exceeded	

\- -

***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	1.1963E-01	1.1989E-01	2.3790E-01	2.3800E-01	2.616E-01
K-40		1.0184E+01	1.0184E+01	1.5752E+00	1.6770E+00	
MN-54	#A	-1.3253E-03	-1.3258E-03	1.1921E-01	1.1921E-01	4.533E-02
CO-57	#B	8.2243E-03	8.2278E-03	3.6775E-02	3.6778E-02	4.108E-02
CO-60	#B	8.4453E-03	8.4458E-03	4.8554E-02	4.8556E-02	5.799E-02

Sr-85	#A	-6.9173E-03	-6.9294E-03	3.9882E-02	3.9884E-02	4.570E-02
Kr-85	#A	-1.8872E+02	-1.8872E+02	1.2540E+03	1.2541E+03	1.063E+03
Y-88	#B	0.0000E+00	0.0000E+00	1.0136E-02	1.0138E-02	2.487E-02
NB-94	#B	-2.3112E-04	-2.3112E-04	8.9676E-03	8.9676E-03	4.175E-02
Ag-108M	#B	1.1178E-02	1.1178E-02	3.9880E-02	3.9885E-02	4.589E-02
CD-109	#A	-4.0103E-02	-4.0113E-02	1.4511E+00	1.4511E+00	1.260E+00
SN-113	#B	-8.2813E-03	-8.2894E-03	4.2797E-02	4.2799E-02	4.917E-02
SB-125	#B	-9.0196E-03	-9.0206E-03	1.1200E-01	1.1200E-01	1.060E-01
I-131	#B	-1.0855E-02	-1.1009E-02	3.5151E-02	3.5156E-02	3.913E-02
CS-134	#B	1.7004E-02	1.7007E-02	2.0530E-02	2.0552E-02	4.012E-02
CS-137	#A	1.4905E-02	1.4905E-02	3.6374E-02	3.6383E-02	4.123E-02
CE-139	#A	-1.5579E-02	-1.5592E-02	4.2934E-02	4.2943E-02	4.659E-02
EU-152	#B	2.2168E-02	2.2169E-02	1.1072E-01	1.1072E-01	1.239E-01
EU-154	#B	9.8777E-03	9.8780E-03	7.7125E-02	7.7127E-02	8.671E-02
EU-155	#A	1.0408E-01	1.0409E-01	1.2395E-01	1.2408E-01	1.342E-01
HG-203	#B	1.1997E-02	1.2026E-02	3.3100E-02	3.3107E-02	3.691E-02
TL-208	#	1.4380E-01	1.4380E-01	5.5477E-02	5.6069E-02	4.359E-02
PB-212	#	3.5931E-01	3.5931E-01	1.0926E-01	1.1114E-01	9.471E-02
PB-214	#	2.8113E-01	2.8113E-01	9.7260E-02	9.8548E-02	7.835E-02
BI-212	#B	4.8297E-03	4.8297E-03	3.1201E-01	3.1201E-01	3.773E-01
BI-214		3.2968E-01	3.2968E-01	1.2330E-01	1.2470E-01	
RA-224	#A	7.3534E-01	7.3534E-01	9.8548E-01	9.8636E-01	1.069E+00
RA-226	#A	8.6314E-01	8.6314E-01	9.9120E-01	9.9240E-01	1.066E+00
AC-228	#	4.2552E-01	4.2552E-01	1.4835E-01	1.5029E-01	1.324E-01
TH-227	#B	-1.8528E-01	-1.8528E-01	3.9781E-01	3.9795E-01	4.295E-01
PA-234	#B	-8.1033E-03	-8.1033E-03	1.3667E-01	1.3667E-01	1.539E-01
TH-234	#B	5.6833E-01	5.6833E-01	1.5328E+00	1.5331E+00	1.709E+00
AM-241	#A	-7.0655E-02	-7.0656E-02	2.4478E-01	2.4482E-01	2.554E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (270.6 to 1999.1 keV) 1.0514144E+01 pCi/gm
Total Decayed Activity (270.6 to 1999.1 keV) 1.0514144E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
DAT

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 101F_25JUL2006_1730.An1

Sample description
FSS-OOL-05-05-007-F

Spectrum Filename: C:\GammaVision\Spectra\101F_25JUL2006_1730.An1

Acquisition information
Start time: 25-Jul-2006 17:30:54
Live time: 2000
Real time: 2002
Dead time: 0.09 %
Detector ID: 1

Detector system
Det 101- DSPE-633

Calibration
Filename: D1_1LSa.Clb
Detector 101 1.0 Liter Marinelli Sand

Energy Calibration
Created: 03-Sep-2004 08:50:48
Zero offset: 0.244 keV
Gain: 0.500 keV/channel
Quadratic: -2.493E-08 keV/channel^2

Efficiency Calibration
Created: 03-Sep-2004 08:52:26
Type: Polynomial
Uncertainty: 0.626 %
Coefficients: -0.321775 -5.816463 0.734234
-0.099357 0.006049 -0.000149

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.23keV)
Stop channel: 4000 (1999.11keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 1.9780E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.9780E+03) =
5.0556E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	24-Jul-2006 09:55:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	101_150K_28APR05.Pbc 01-May-2005 05:24:47
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 16 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.4870

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
75.02	182.	19.98	1.00	1.666E-02	74.81	9.600	7.621E-01	PB212
77.16	394.	8.60	1.01	1.727E-02	77.11	10.700	1.447E+00	PB214
					77.11	17.500	8.931E-01	PB212
84.22	102.	28.81	1.01	1.873E-02				
87.27	116.	26.38	1.01	1.921E-02	86.45	32.740	1.267E-01	EU155
89.77	118.	26.40	1.02	1.954E-02	88.04	3.790	PBC<MDA	CD109
93.64	122.	23.43	1.02	1.997E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
129.30	93.	36.27	0.65	2.109E-02				
186.25	118.	24.43	1.93	1.857E-02	185.99	3.280	1.323E+00	RA226
210.30	72.	38.28	0.95	1.716E-02				
238.96	801.	4.07	1.12	1.556E-02	238.63	43.100	8.087E-01	PB212
242.21	102.	20.61	1.12	1.539E-02	241.00	3.900	PBC<MDA	RA224
					241.92	7.470	6.042E-01	PB214
270.20	69.	33.01	1.06	1.401E-02				
295.61	165.	11.64	1.17	1.290E-02	295.22	19.200	4.495E-01	PB214
300.83	58.	30.75	1.52	1.270E-02				
328.54	57.	30.27	0.95	1.168E-02				
338.86	138.	16.16	1.07	1.133E-02	338.40	12.010	6.782E-01	AC228
352.27	268.	10.08	1.23	1.092E-02	351.99	37.100	4.484E-01	PB214
463.63	65.	26.41	1.35	8.340E-03	463.51	10.000	5.243E-01	SB125
511.56	127.	15.22	1.45	7.578E-03	510.72	22.500	4.439E-01	TL208
583.76	229.	11.43	1.29	6.678E-03	583.14	86.000	2.693E-01	TL208
609.90	184.	10.38	1.24	6.407E-03	609.32	46.090	4.235E-01	BI214
727.80	74.	17.58	1.30	5.439E-03	723.30	19.700	4.689E-01	EU154
					727.17	11.800	7.831E-01	BI212
795.76	26.	37.88	1.50	5.016E-03	795.76	85.400	PBC<MDA	CS134

911.88	139.	11.26	1.41	4.443E-03	911.07	29.000	7.260E-01	AC228
968.97	130.	15.08	1.14	4.212E-03	968.90	17.460	1.201E+00	AC228
1120.40	58.	23.84	1.97	3.711E-03	1120.28	15.040	7.127E-01	BI214
1462.09	665.	4.06	2.02	2.940E-03	1460.75	10.700	1.438E+01	K40
1765.97	31.	18.85	1.45	2.481E-03	1764.51	15.920	5.372E-01	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide
150.05	75.22	594.	161.	0.080	68.44	1.005	PB-214 D
174.12	87.21	409.	116.	0.058	79.14	1.014	PB-214 lD
179.12	89.71	424.	118.	0.059	79.19	1.016	PB-214 lD
420.27	210.30	299.	72.	0.036	114.84	0.954	TH-227 s
477.63	238.90	131.	801.	0.400	12.21	1.122	PB-212 D
540.12	270.20	186.	69.	0.034	99.02	1.061	AC-228
601.41	300.83	116.	58.	0.029	92.24	1.518	PB-212 s
656.86	328.54	113.	57.	0.028	90.82	0.951	RH-106M s

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-212	149.37	74.90	1135.	183.	0.092	78.79	1.499
PB-214	153.79	77.11	442.	388.	0.194	27.24	1.006D
PB-212	153.79	77.11	1034.	319.	0.159	45.96	1.499D
TH-234	186.44	93.43	886.	121.	0.061	98.69	1.499s
TH-234	186.39	93.40	910.	126.	0.063	99.78	1.499s
RA-226	372.11	186.23	493.	100.	0.050	98.69	1.499s
PB-212	477.57	238.94	418.	694.	0.347	16.72	1.499
PB-214	483.54	241.92	164.	101.	0.051	60.88	1.124D
PB-214	590.96	295.61	104.	163.	0.082	34.93	1.171s
AC-228	677.51	338.86	145.	135.	0.068	48.48	1.075
PB-214	704.34	352.27	156.	266.	0.133	30.24	1.235
SB-125	927.14	463.62	99.	49.	0.025	93.11	1.499s
TL-208	1023.07	511.56	93.	111.	0.055	45.65	1.453s
TL-208	1167.52	583.76	116.	227.	0.113	34.29	1.291
BI-214	1219.84	609.90	64.	183.	0.092	31.15	1.242
EU-154	1455.79	727.82	40.	31.	0.016	99.03	1.499s
BI-212	1455.75	727.80	36.	74.	0.037	52.75	1.301s
CS-134	1591.74	795.76	38.	26.	0.013	113.65	1.502
AC-228	1824.12	911.88	41.	137.	0.069	33.77	1.413
AC-228	1938.36	968.97	63.	129.	0.065	45.23	1.137s
BI-214	2241.38	1120.40	42.	58.	0.029	71.53	1.973s
K-40	2925.21	1462.09	19.	663.	0.331	12.18	2.016

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
BI-214	3533.38	1765.97	2.	31.	0.016	56.54	1.453s

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	Peak MDA Value pCi/gm	Peak COMMENTS
BE-7		-8.6493E-02					
			477.56	-8.649E-02	&(	3.561E-01	1.05E-01 G
K-40		1.4385E+01					
			1460.75	1.438E+01	(P	5.005E-01	5.86E-01 G
MN-54		6.4309E-03					
			834.81	6.431E-03	&(P	4.771E-02	1.36E-02 G
CO-57		-1.5598E-02					
			122.07	-1.560E-02	%(	4.983E-02	1.50E-02 G K
			136.43	4.070E-02	&	3.865E-01	1.15E-01 G
CO-60		-7.6350E-03					
			1332.51	-7.635E-03	%(P	6.256E-02	1.77E-02 G K
			1173.23	-1.226E-02	% P	7.383E-02	2.13E-02 G K
Sr-85		-7.8895E-03					
			514.00	-7.889E-03	%(	4.130E-02	1.21E-02 G
Kr-85		-1.9986E+02					
			513.99	-1.999E+02	%(P	9.458E+02	2.75E+02 G
Y-88		0.0000E+00					
			1836.01	0.000E+00	%(	2.137E-02	2.90E-03 G K
			898.02	-2.894E-04	& P	5.297E-02	1.47E-02 G
NB-94		2.0026E-03					
			871.10	2.003E-03	%(P	4.148E-02	1.15E-02 G K
			702.50	4.318E-04	% P	4.704E-02	1.33E-02 G K
Ag-108M		-1.4686E-03					
			722.95	-1.469E-03	&(	7.520E-02	2.17E-02 G K
			614.37	-4.166E-03	% P	5.046E-02	1.45E-02 G
			433.93	0.000E+00	%	4.630E-02	1.33E-02 G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CD-109	1.4978E-01						
		88.04	1.498E-01	&(P	1.483E+00	4.44E-01	G
SN-113	-1.5260E-02						
		391.71	-1.526E-02	%(	6.498E-02	1.93E-02	G K
		255.04	3.867E-01	& P	1.640E+00	4.88E-01	G
SB-125	1.0084E-01						
		427.95	-8.347E-04	%(P	1.249E-01	3.57E-02	G K
		600.77	-4.519E-02	% P	2.414E-01	7.03E-02	G
		636.15	1.121E-01	% P	2.893E-01	8.62E-02	G
		463.51	4.018E-01	@(P	4.020E-01	1.28E-01	G
		176.29	8.820E-02	% P	5.114E-01	1.52E-01	G
I-131	1.3119E-02						
		364.48	1.312E-02	%(	4.736E-02	1.41E-02	G K
		636.97	2.041E-01	&	5.150E-01	1.54E-01	G
		284.29	1.021E-01	%	6.784E-01	2.01E-01	G
CS-134	1.9318E-02						
		604.66	-4.906E-04	%(P	4.916E-02	1.40E-02	G K
		795.76	4.196E-02	(P	5.032E-02	1.61E-02	G
		569.29	-3.186E-02	% P	2.972E-01	8.58E-02	G
		801.84	0.000E+00	%	6.621E-01	1.88E-01	G
CS-137	-1.3470E-02						
		661.62	-1.347E-02	&(P	5.936E-02	1.73E-02	G
CE-139	7.4991E-03						
		165.85	7.499E-03	%(P	4.829E-02	1.44E-02	G
EU-152	5.4601E-03						
		121.78	5.460E-03	%(P	1.322E-01	3.93E-02	G K
		344.30	2.325E-02	% P	1.228E-01	3.61E-02	G
		1408.08	-1.884E-03	& P	2.227E-01	5.85E-02	G
		964.00	2.395E-01	% P	4.164E-01	1.28E-01	G
		1112.07	2.483E-01	% P	3.815E-01	1.20E-01	G
		778.90	-5.449E-02	& P	3.621E-01	1.04E-01	G
EU-154	4.5383E-02						
		123.10	-2.959E-02	%(P	1.015E-01	3.05E-02	G K
		1274.80	-1.865E-02	% P	1.833E-01	5.19E-02	G
		723.30	1.994E-01	&(P	2.031E-01	6.66E-02	G
		1004.80	2.391E-02	% P	2.785E-01	7.81E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
EU-155	6.9829E-03						
		86.45	6.983E-03	&(	1.801E-01	5.38E-02	G K
		105.31	3.326E-02	&	1.955E-01	5.85E-02	G
HG-203	1.1189E-03						
		279.17	1.119E-03	%(	4.161E-02	1.21E-02	G K
		72.87	-5.598E-01	% P	1.243E+00	3.76E-01	G
		70.83	-1.269E+00	%	2.237E+00	6.81E-01	G
		82.50	-5.808E-01	%	2.273E+00	6.83E-01	G
TL-208	2.6933E-01						
		583.14	2.693E-01	(P	6.296E-02	3.11E-02	G
		510.72	4.439E-01	+ P	1.906E-01	7.74E-02	G
PB-212	7.2175E-01						
		238.63	7.063E-01	(P	9.968E-02	3.97E-02	G K
							Energy duplication
		77.11	7.237E-01	(	3.462E-01	1.11E-01	G
		74.81	7.878E-01	&(P	6.870E-01	2.13E-01	G
PB-214	4.4879E-01						
		351.99	4.484E-01	(P	1.027E-01	4.56E-02	G K
		295.22	4.495E-01	@(P	1.382E-01	5.30E-02	G
							Energy duplication
		77.11	1.441E+00	+ P	3.735E-01	1.32E-01	G
		241.92	6.013E-01	+ P	3.702E-01	1.23E-01	G
BI-212	7.8313E-01						
		727.17	7.831E-01	*(P	3.278E-01	1.39E-01	G K
		1620.56	-7.645E-02	%	1.756E+00	4.64E-01	G
		785.42	5.549E-02	% P	2.241E+00	6.27E-01	G
BI-214	4.5266E-01						
		609.32	4.235E-01	(P	9.231E-02	4.43E-02	G K
		1764.51	5.372E-01	(P	1.591E-01	1.03E-01	G
		1120.28	7.127E-01	+ P	4.019E-01	1.71E-01	G
RA-224	5.8983E-01						
		241.00	5.898E-01	%(P	1.217E+00	3.69E-01	G
RA-226	1.1227E+00						
		185.99	1.123E+00	*(	1.190E+00	3.69E-01	G
AC-228	7.1202E-01						
		911.07	7.260E-01	(P	1.724E-01	8.29E-02	G K
		968.90	1.201E+00	+ P	3.680E-01	1.82E-01	G
		338.40	6.782E-01	(P	2.945E-01	1.12E-01	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments

TH-227      -1.2401E-01
                          236.00-1.240E-01 %(P 4.546E-01 1.36E-01 G K
                          256.25-1.338E-01 % P 5.677E-01 1.69E-01 G

PA-234      -1.6718E-03
                           98.44-1.672E-03 %(  1.713E-01 5.09E-02 G K
                          946.00 5.783E-02 &   2.173E-01 6.32E-02 G
                          131.28-6.355E-02 %   2.240E-01 6.74E-02 G
                           94.67-8.814E-02 &   2.660E-01 8.01E-02 G
                          883.24 6.881E-02 &   3.828E-01 1.10E-01 G
                          926.70-1.829E-02 &   4.214E-01 1.17E-01 G
                          569.26-4.281E-02 %   4.280E-01 1.24E-01 G

TH-234       1.0562E+00
                           63.29 3.847E-01 %(P 2.331E+00 6.97E-01 G K
                           92.80 1.445E+00  (P 1.640E+00 5.04E-01 G
                           92.38 1.621E+00 &(P 1.894E+00 5.81E-01 G

AM-241       5.4625E-02
                           59.54 5.462E-02 %(P 3.096E-01 9.28E-02 G
   ( - This peak used in the nuclide activity average.

   * - Peak is too wide, but only one peak in library.
   ! - Peak is part of a multiplet and this area went
       negative during deconvolution.
   ? - Peak is too narrow.
   @ - Peak is too wide at FW25M, but ok at FWHM.
   % - Peak fails sensitivity test.
   $ - Peak identified, but first peak of this nuclide
       failed one or more qualification tests.
   + - Peak activity higher than counting uncertainty range.
   - - Peak activity lower than counting uncertainty range.
   = - Peak outside analysis energy range.
   & - Calculated peak centroid is not close enough to the
       library energy centroid for positive identification.
   P - Peakbackground subtraction
   } - Peak is too close to another for the activity
       to be found directly.

   Nuclide Codes:                      Peak Codes:
   T - Thermal Neutron Activation      G - Gamma Ray
   F - Fast Neutron Activation         X - X-Ray
   I - Fission Product                 P - Positron Decay
   N - Naturally Occurring Isotope     S - Single-Escape
   P - Photon Reaction                 D - Double-Escape
   C - Charged Particle Reaction       K - Key Line
   M - No MDA Calculation              A - Not in Average
```

R - Coincidence Corrected C - Coincidence Peak
H - Halflife limit exceeded

- -

***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	-8.5028E-02	-8.6493E-02	3.1412E-01	3.1416E-01	3.500E-01
K-40		1.4385E+01	1.4385E+01	1.7577E+00	1.9365E+00	
MN-54	#A	6.4122E-03	6.4309E-03	4.0843E-02	4.0845E-02	4.757E-02
CO-57	#B	-1.5545E-02	-1.5598E-02	4.5029E-02	4.5037E-02	4.966E-02
CO-60	#B	-7.6313E-03	-7.6350E-03	5.5611E-02	5.5613E-02	6.253E-02
Sr-85	#A	-7.7792E-03	-7.8895E-03	3.6240E-02	3.6243E-02	4.073E-02
Kr-85	#A	-1.9986E+02	-1.9986E+02	1.0568E+03	1.0569E+03	9.458E+02
Y-88	#B	0.0000E+00	0.0000E+00	8.6997E-03	8.7013E-03	2.119E-02
NB-94	#B	2.0026E-03	2.0026E-03	3.4472E-02	3.4473E-02	4.148E-02
Ag-108M	#B	-1.4685E-03	-1.4686E-03	6.5202E-02	6.5202E-02	7.520E-02
CD-109	#A	1.4948E-01	1.4978E-01	1.3319E+00	1.3319E+00	1.480E+00
SN-113	#B	-1.5140E-02	-1.5260E-02	5.7778E-02	5.7784E-02	6.446E-02
SB-125	#B	1.0075E-01	1.0084E-01	9.6661E-02	9.6829E-02	1.248E-01
I-131	#B	1.1711E-02	1.3119E-02	4.2183E-02	4.2190E-02	4.228E-02
CS-134	#B	1.9294E-02	1.9318E-02	2.2304E-02	2.2331E-02	4.910E-02
CS-137	#A	-1.3469E-02	-1.3470E-02	6.2035E-02	6.2040E-02	5.936E-02
CE-139	#A	7.4495E-03	7.4991E-03	4.3229E-02	4.3231E-02	4.798E-02
EU-152	#B	5.4590E-03	5.4601E-03	1.1780E-01	1.1780E-01	1.321E-01
EU-154	#B	4.5370E-02	4.5383E-02	4.5463E-02	4.5533E-02	1.015E-01
EU-155	#B	6.9794E-03	6.9829E-03	1.6151E-01	1.6151E-01	1.800E-01
HG-203	#B	1.0972E-03	1.1189E-03	3.6419E-02	3.6420E-02	4.080E-02
TL-208		2.6933E-01	2.6933E-01	9.3313E-02	9.4546E-02	
PB-212	#	7.2175E-01	7.2175E-01	1.2177E-01	1.2842E-01	9.968E-02
PB-214		4.4879E-01	4.4879E-01	1.0465E-01	1.0768E-01	
BI-212	#	7.8313E-01	7.8313E-01	4.1692E-01	4.1926E-01	
BI-214		4.5266E-01	4.5266E-01	1.4184E-01	1.4413E-01	
RA-224	#A	5.8983E-01	5.8983E-01	1.1069E+00	1.1074E+00	1.217E+00
RA-226	#A	1.1227E+00	1.1227E+00	1.1080E+00	1.1098E+00	1.190E+00
AC-228		7.1202E-01	7.1202E-01	2.1357E-01	2.1732E-01	
TH-227	#B	-1.2401E-01	-1.2401E-01	4.2071E-01	4.2077E-01	4.546E-01
PA-234	#B	-1.6718E-03	-1.6718E-03	1.5269E-01	1.5269E-01	1.713E-01
TH-234	#B	1.0562E+00	1.0562E+00	1.1055E+00	1.1071E+00	2.331E+00
AM-241	#A	5.4624E-02	5.4625E-02	2.7830E-01	2.7831E-01	3.096E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.

H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (270.1 to 1999.1 keV) 1.7050880E+01 pCi/gm
Total Decayed Activity (270.1 to 1999.1 keV) 1.7050880E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
DAT

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 101F_25JUL2006_1808.An1

Sample description
FSS-OOL-05-05-020-F

Spectrum Filename: C:\GammaVision\Spectra\101F_25JUL2006_1808.An1

Acquisition information

Start time:	25-Jul-2006 18:08:23
Live time:	2000
Real time:	2002
Dead time:	0.08 %
Detector ID:	1

Detector system
Det 101- DSPE-633

Calibration

Filename:	D1_1LSa.Clb

Detector 101 1.0 Liter Marinelli Sand

Energy Calibration

Created:	03-Sep-2004 08:50:48
Zero offset:	0.244 keV
Gain:	0.500 keV/channel
Quadratic:	-2.493E-08 keV/channel^2

Efficiency Calibration

Created:	03-Sep-2004 08:52:26
Type:	Polynomial
Uncertainty:	0.626 %
Coefficients:	-0.321775 -5.816463 0.734234
	-0.099357 0.006049 -0.000149

Library Files

Main analysis library:	FSS_Rev_1.Lib
Library Match Width:	1.000
Peak stripping:	Library based

Analysis parameters

Analysis engine:	Env32 G53W4.20
Start channel:	100 (50.23keV)
Stop channel:	4000 (1999.11keV)
Peak rejection level:	41.667%
Peak search sensitivity:	3
Sample Size:	1.8970E+03
Activity scaling factor:	1.0000E+06/(1.0000E+00* 1.8970E+03) = 5.2715E+02
Detection limit method:	Nureg 4.16
Random error:	1.0000000E+00
Systematic error:	1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	24-Jul-2006 07:40:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	101_150K_28APR05.Pbc 01-May-2005 05:24:47
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 14 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.4923

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
63.34	98.	39.22	0.86	1.122E-02	59.54	36.300	PBC<MDA	AM241
					63.29	3.900	PBC<MDA	TH234
74.38	146.	22.19	1.00	1.651E-02				
74.38	146.	22.19	1.00	1.651E-02	74.81	9.600	PBC<MDA	PB212
77.38	301.	10.82	1.01	1.736E-02	77.11	17.500	7.125E-01	PB212
					77.11	10.700	1.151E+00	PB214
87.35	135.	31.62	1.50	1.910E-02	86.45	32.740	PBC<MDA	EU155
					88.04	3.790	PBC<MDA	CD109
87.37	128.	32.70	1.50	1.932E-02	86.45	32.740	PBC<MDA	EU155
					88.04	3.790	PBC<MDA	CD109
93.19	130.	30.22	1.50	1.989E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
129.12	96.	40.17	1.39	2.110E-02				
186.16	143.	20.53	1.22	1.857E-02	185.99	3.280	1.676E+00	RA226
209.89	72.	36.89	1.56	1.718E-02				
238.98	711.	4.34	1.12	1.556E-02	238.63	43.100	7.479E-01	PB212
241.78	104.	23.32	1.12	1.541E-02	241.00	3.900	1.219E+00	RA224
					241.92	7.470	PBC<MDA	PB214
270.42	102.	22.72	1.50	1.400E-02				
295.60	162.	11.48	1.16	1.291E-02	295.22	19.200	4.589E-01	PB214
300.44	42.	33.79	1.16	1.272E-02				
338.77	164.	15.72	1.15	1.134E-02	338.40	12.010	8.462E-01	AC228
352.36	266.	10.34	1.20	1.091E-02	351.99	37.100	4.649E-01	PB214
410.36	34.	40.70	1.11	9.400E-03				
463.30	64.	27.41	1.26	8.345E-03				
463.30	64.	27.41	1.26	8.345E-03	463.51	10.000	5.390E-01	SB125
511.72	112.	19.65	1.46	7.576E-03	510.72	22.500	4.024E-01	TL208

583.60	212.	9.57	1.38	6.679E-03	583.14	86.000	2.593E-01	TL208
609.73	207.	9.20	1.36	6.409E-03	609.32	46.090	4.967E-01	BI214
727.69	69.	20.85	0.95	5.439E-03	727.17	11.800	7.578E-01	BI212
795.67	60.	27.57	1.43	5.017E-03				
795.67	60.	27.57	1.43	5.017E-03	795.76	85.400	9.955E-02	CS134
912.06	142.	11.84	1.54	4.442E-03	911.07	29.000	7.742E-01	AC228
969.18	127.	13.78	1.45	4.211E-03	968.90	17.460	1.219E+00	AC228

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
1121.42	71.	21.77	2.21	3.711E-03	1120.28	15.040	9.014E-01	BI214
1461.96	626.	4.08	1.99	2.940E-03	1460.75	10.700	1.410E+01	K40
1765.65	37.	16.44	1.14	2.481E-03	1764.51	15.920	6.593E-01	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
126.24	63.34	580.	98.	0.049	117.66	0.862	PA-234	l
148.33	74.72	452.	146.	0.073	66.57	1.005	BI-207	D
154.33	77.72	380.	301.	0.151	32.45	1.007	PB-214	D
257.85	129.12	533.	113.	0.057	91.12	1.387	AC-228	s
419.46	209.89	280.	72.	0.036	110.67	1.564	NP-239	s
477.66	238.91	121.	711.	0.355	13.03	1.122	PB-212	D
483.25	241.70	241.	104.	0.052	69.96	1.124	PB-214	D
540.56	270.42	174.	102.	0.051	68.16	1.497	AC-228	s
600.38	300.32	104.	40.	0.020	118.11	1.087	PB-212	s
820.57	410.36	63.	34.	0.017	122.10	1.109	EU-152	

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-212	149.19	74.81	1016.	164.	0.082	83.11	1.499s
PB-212	153.79	77.11	910.	264.	0.132	51.85	1.499D
PB-214	153.79	77.11	914.	260.	0.130	51.85	1.499D
EU-155	174.28	87.35	842.	135.	0.067	94.87	1.499
CD-109	174.32	87.37	822.	128.	0.064	98.11	1.499
TH-234	185.97	93.19	790.	130.	0.065	90.66	1.499s
RA-226	372.03	186.19	421.	127.	0.064	73.28	1.499
PB-212	477.54	238.92	406.	572.	0.286	19.24	1.499
RA-224	483.38	241.84	421.	88.	0.044	102.90	1.499
PB-214	590.87	295.56	191.	167.	0.083	41.60	1.499s
AC-228	677.32	338.77	175.	162.	0.081	47.16	1.150
PB-214	704.37	352.29	129.	207.	0.104	30.88	1.499
SB-125	927.14	463.62	80.	41.	0.021	99.21	1.499s
TL-208	1023.37	511.72	124.	96.	0.048	58.95	1.459s
TL-208	1167.22	583.60	71.	209.	0.105	28.71	1.378s
BI-214	1219.50	609.73	59.	206.	0.103	27.60	1.357s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
BI-212	1455.54	727.69	47.	68.	0.034	62.55	0.951s
CS-134	1592.11	795.94	41.	38.	0.019	84.92	1.502s
AC-228	1824.47	912.06	46.	140.	0.070	35.53	1.545s
AC-228	1938.78	969.18	50.	126.	0.063	41.35	1.453s
BI-214	2243.42	1121.42	42.	71.	0.035	65.32	2.206s
K-40	2924.94	1461.96	10.	623.	0.312	12.24	1.991
BI-214	3532.73	1765.65	0.	37.	0.018	49.32	1.137s

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	Peak MDA Value pCi/gm	COMMENTS
BE-7		-9.2577E-03					
			477.56	-9.258E-03	&(	4.343E-01 1.25E-01	G
K-40		1.4101E+01					
			1460.75	1.410E+01	(P	3.910E-01 5.78E-01	G
MN-54		-1.3001E-02					
			834.81	-1.300E-02	%(P	5.268E-02 1.53E-02	G
CO-57		-5.5562E-04					
			122.07	-5.556E-04	%(	4.638E-02 1.38E-02	G K
			136.43	-7.043E-02	%	3.803E-01 1.14E-01	G
CO-60		1.2299E-02					
			1332.51	1.230E-02	%(P	4.673E-02 1.34E-02	G K
			1173.23	-1.123E-02	% P	7.243E-02 2.08E-02	G K
Sr-85		2.4186E-03					
			514.00	2.419E-03	&(	5.401E-02 1.57E-02	G
Kr-85		2.9160E+01					
			513.99	2.916E+01	&(P	1.233E+03 3.56E+02	G
Y-88		-4.5778E-03					
			1836.01	-4.578E-03	%(	3.914E-02 1.01E-02	G K
			898.02	5.739E-05	% P	4.348E-02 1.18E-02	G
NB-94		7.3837E-03					
			871.10	7.384E-03	%(P	4.281E-02 1.22E-02	G K
			702.50	-1.370E-02	& P	5.056E-02 1.49E-02	G K

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
Ag-108M	-8.3285E-03						
		722.95	-8.328E-03	&(	5.423E-02	1.57E-02	G K
		614.37	-1.799E-02	% P	5.235E-02	1.56E-02	G
		433.93	-4.097E-03	%	4.150E-02	1.20E-02	G
CD-109	1.2504E+00						
		88.04	1.250E+00	&(P	1.329E+00	4.10E-01	G
SN-113	1.3684E-02						
		391.71	1.368E-02	%(	5.168E-02	1.53E-02	G K
		255.04	5.022E-01	% P	1.696E+00	5.07E-01	G
SB-125	8.1861E-02						
		427.95	-9.461E-03	%(P	1.239E-01	3.57E-02	G K
		600.77	-7.728E-02	% P	2.665E-01	7.88E-02	G
		636.15	-2.800E-02	% P	4.193E-01	1.20E-01	G
		463.51	3.522E-01	*(P	3.785E-01	1.21E-01	G
		176.29	2.176E-02	& P	6.160E-01	1.82E-01	G
I-131	-4.0103E-03						
		364.48	-4.010E-03	%(	4.910E-02	1.43E-02	G K
		636.97	-1.281E-01	&	6.642E-01	1.93E-01	G
		284.29	1.467E-03	%	5.347E-01	1.54E-01	G
CS-134	2.3747E-02						
		604.66	-1.124E-02	&(P	5.781E-02	1.69E-02	G K
		795.76	6.373E-02	@(P	5.423E-02	1.82E-02	G
		569.29	3.963E-02	& P	2.765E-01	7.99E-02	G
		801.84	8.906E-02	&	4.187E-01	1.20E-01	G
CS-137	6.7224E-03						
		661.62	6.722E-03	%(P	5.173E-02	1.48E-02	G
CE-139	-7.1366E-03						
		165.85	-7.137E-03	%(P	5.122E-02	1.53E-02	G
EU-152	7.2197E-04						
		121.78	7.220E-04	%(P	1.375E-01	4.08E-02	G K
		344.30	-3.036E-03	% P	1.394E-01	4.03E-02	G
		1408.08	9.664E-03	% P	2.257E-01	6.01E-02	G
		964.00	-9.131E-02	% P	4.666E-01	1.35E-01	G
		1112.07	1.628E-01	% P	3.423E-01	1.04E-01	G
		778.90	-1.049E-03	% P	4.535E-01	1.29E-01	G
EU-154	8.3378E-03						
		123.10	8.338E-03	%(P	1.007E-01	3.00E-02	G K
		1274.80	6.285E-02	% P	1.742E-01	5.17E-02	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          723.30-1.625E-03 % P 2.816E-01 7.98E-02 G
                         1004.80-6.175E-04 & P 3.540E-01 9.92E-02 G

EU-155       1.5372E-01
                           86.45 1.537E-01  (  1.572E-01 4.86E-02 G K
                          105.31 1.739E-02 &   2.026E-01 6.04E-02 G

HG-203       2.9332E-02
                          279.17 2.933E-02 &(  4.182E-02 1.29E-02 G K
                           72.87-2.088E-01 % P 1.178E+00 3.53E-01 G
                           70.83-3.334E-02 &   2.056E+00 6.13E-01 G
                           82.50-7.676E-01 %   2.545E+00 7.67E-01 G

TL-208       2.5927E-01
                          583.14 2.593E-01 @(P 5.194E-02 2.51E-02 G
                          510.72 4.024E-01 + P 2.273E-01 9.23E-02 G

PB-212       6.2922E-01
                          238.63 6.075E-01  (P 1.025E-01 3.94E-02 G K
                                                          Energy duplication
                           77.11 6.251E-01  (  3.391E-01 1.08E-01 G
                           74.81 7.342E-01 ?(P 6.784E-01 2.10E-01 G

PB-214       3.6429E-01
                          351.99 3.643E-01  (P 9.792E-02 3.79E-02 G K
                          295.22 4.795E-01 + P 1.929E-01 6.72E-02 G
                                                          Energy duplication
                           77.11 1.008E+00 + P 5.557E-01 1.77E-01 G
                          241.92-1.057E-01 % P 7.890E-01 2.36E-01 G

BI-212       7.5779E-01
                          727.17 7.578E-01 @(P 3.832E-01 1.60E-01 G K
                         1620.56 1.093E-02 &   1.673E+00 4.30E-01 G
                          785.42-8.798E-02 & P 2.538E+00 7.14E-01 G

BI-214       4.9672E-01
                          609.32 4.967E-01 @(P 9.274E-02 4.60E-02 G K
                         1764.51 6.593E-01 + P 1.329E-01 1.10E-01 G
                         1120.28 9.014E-01 + P 4.218E-01 1.97E-01 G

RA-224       1.0425E+00
                          241.00 1.042E+00 &(P 1.163E+00 3.60E-01 G

RA-226       1.4891E+00
                          185.99 1.489E+00  (  1.149E+00 3.64E-01 G

AC-228       7.9524E-01
                          911.07 7.742E-01 @(P 1.893E-01 9.30E-02 G K
                          968.90 1.219E+00 + P 3.458E-01 1.69E-01 G
                          338.40 8.462E-01  (P 3.364E-01 1.35E-01 G
```

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments

TH-227       2.5431E-03
                          236.00 2.543E-03 %(P 4.753E-01 1.41E-01 G K
                          256.25-5.719E-02 & P 5.448E-01 1.60E-01 G

PA-234       6.8933E-02
                           98.44 6.893E-02 &(  1.741E-01 5.26E-02 G K
                          946.00 5.327E-02 %   2.277E-01 6.57E-02 G
                          131.28-3.431E-02 &   2.107E-01 6.30E-02 G
                           94.67-9.998E-02 %   3.280E-01 9.88E-02 G
                          883.24-6.990E-02 %   3.802E-01 1.09E-01 G
                          926.70-3.278E-03 %   4.212E-01 1.16E-01 G
                          569.26 6.159E-02 &   4.065E-01 1.18E-01 G

TH-234       1.2434E+00
                           63.29 1.003E+00 %(P 2.085E+00 6.31E-01 G K
                           92.80 1.556E+00  (P 1.595E+00 4.93E-01 G
                           92.38-2.556E-01 % P 2.076E+00 6.16E-01 G

AM-241      -4.7592E-02
                           59.54-4.759E-02 &(P 2.531E-01 7.56E-02 G
   ( - This peak used in the nuclide activity average.

   * - Peak is too wide, but only one peak in library.
   ! - Peak is part of a multiplet and this area went
       negative during deconvolution.
   ? - Peak is too narrow.
   @ - Peak is too wide at FW25M, but ok at FWHM.
   % - Peak fails sensitivity test.
   $ - Peak identified, but first peak of this nuclide
       failed one or more qualification tests.
   + - Peak activity higher than counting uncertainty range.
   - - Peak activity lower than counting uncertainty range.
   = - Peak outside analysis energy range.
   & - Calculated peak centroid is not close enough to the
       library energy centroid for positive identification.
   P - Peakbackground subtraction
   } - Peak is too close to another for the activity
       to be found directly.

   Nuclide Codes:                      Peak Codes:
   T - Thermal Neutron Activation      G - Gamma Ray
   F - Fast Neutron Activation         X - X-Ray
   I - Fission Product                 P - Positron Decay
   N - Naturally Occurring Isotope     S - Single-Escape
   P - Photon Reaction                 D - Double-Escape
   C - Charged Particle Reaction       K - Key Line
   M - No MDA Calculation              A - Not in Average
```

R - Coincidence Corrected C - Coincidence Peak
H - Halflife limit exceeded

- -

***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	-9.0867E-03	-9.2577E-03	3.7492E-01	3.7492E-01	4.263E-01
K-40		1.4101E+01	1.4101E+01	1.7329E+00	1.9073E+00	
MN-54	#A	-1.2960E-02	-1.3001E-02	5.0562E-02	5.0567E-02	5.252E-02
CO-57	#B	-5.5357E-04	-5.5562E-04	4.1280E-02	4.1280E-02	4.621E-02
CO-60	#B	1.2292E-02	1.2299E-02	4.0183E-02	4.0189E-02	4.670E-02
Sr-85	#A	2.3818E-03	2.4186E-03	4.7010E-02	4.7010E-02	5.318E-02
Kr-85	#A	2.9160E+01	2.9160E+01	1.0687E+03	1.0687E+03	1.233E+03
Y-88	#B	-4.5352E-03	-4.5778E-03	3.0302E-02	3.0303E-02	3.878E-02
NB-94	#B	7.3837E-03	7.3837E-03	3.6567E-02	3.6569E-02	4.281E-02
Ag-108M	#B	-8.3283E-03	-8.3285E-03	4.6986E-02	4.6989E-02	5.423E-02
CD-109	#A	1.2476E+00	1.2504E+00	1.2312E+00	1.2331E+00	1.326E+00
SN-113	#B	1.3566E-02	1.3684E-02	4.5796E-02	4.5803E-02	5.123E-02
SB-125	#B	8.1781E-02	8.1861E-02	8.4067E-02	8.4194E-02	1.238E-01
I-131	#B	-3.5432E-03	-4.0103E-03	4.2781E-02	4.2781E-02	4.338E-02
CS-134	#B	2.3715E-02	2.3747E-02	2.0385E-02	2.0429E-02	5.773E-02
CS-137	#A	6.7218E-03	6.7224E-03	4.4393E-02	4.4394E-02	5.173E-02
CE-139	#A	-7.0851E-03	-7.1366E-03	4.7759E-02	4.7761E-02	5.085E-02
EU-152	#B	7.2181E-04	7.2197E-04	1.2232E-01	1.2232E-01	1.375E-01
EU-154	#B	8.3352E-03	8.3378E-03	8.9983E-02	8.9984E-02	1.007E-01
EU-155	#A	1.5364E-01	1.5372E-01	1.4584E-01	1.4608E-01	1.571E-01
HG-203	#B	2.8712E-02	2.9332E-02	3.8761E-02	3.8796E-02	4.094E-02
TL-208	#	2.5927E-01	2.5927E-01	7.5271E-02	7.6683E-02	
PB-212	#	6.2922E-01	6.2922E-01	1.2239E-01	1.2745E-01	1.025E-01
PB-214	#	3.6429E-01	3.6429E-01	1.1358E-01	1.1543E-01	9.792E-02
BI-212	#	7.5779E-01	7.5779E-01	4.7873E-01	4.8064E-01	
BI-214		4.9672E-01	4.9672E-01	1.3781E-01	1.4064E-01	
RA-224	#A	1.0425E+00	1.0425E+00	1.0815E+00	1.0831E+00	1.163E+00
RA-226	#	1.4891E+00	1.4891E+00	1.0912E+00	1.0944E+00	1.149E+00
AC-228		7.9524E-01	7.9524E-01	2.3794E-01	2.4214E-01	
TH-227	#B	2.5431E-03	2.5431E-03	4.2279E-01	4.2279E-01	4.753E-01
PA-234	#B	6.8933E-02	6.8933E-02	1.5784E-01	1.5789E-01	1.741E-01
TH-234	#B	1.2434E+00	1.2434E+00	1.1807E+00	1.1827E+00	2.085E+00
AM-241	#A	-4.7591E-02	-4.7592E-02	2.4696E-01	2.4697E-01	2.531E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.

H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (270.1 to 1999.1 keV) 1.6409952E+01 pCi/gm
Total Decayed Activity (270.1 to 1999.1 keV) 1.6409952E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
DAT

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 101F_25JUL2006_1844.An1

Sample description
FSS-OOL-05-05-017-F

Spectrum Filename: C:\GammaVision\Spectra\101F_25JUL2006_1844.An1

Acquisition information

Start time:	25-Jul-2006 18:44:46
Live time:	2000
Real time:	2001
Dead time:	0.07 %
Detector ID:	1

Detector system
Det 101- DSPE-633

Calibration
Filename: D1_1LSa.Clb
Detector 101 1.0 Liter Marinelli Sand

Energy Calibration

Created:	03-Sep-2004 08:50:48
Zero offset:	0.244 keV
Gain:	0.500 keV/channel
Quadratic:	-2.493E-08 keV/channel^2

Efficiency Calibration

Created:	03-Sep-2004 08:52:26
Type:	Polynomial
Uncertainty:	0.626 %
Coefficients:	-0.321775 -5.816463 0.734234
	-0.099357 0.006049 -0.000149

Library Files

Main analysis library:	FSS_Rev_1.Lib
Library Match Width:	1.000
Peak stripping:	Library based

Analysis parameters

Analysis engine:	Env32 G53W4.20
Start channel:	100 (50.23keV)
Stop channel:	4000 (1999.11keV)
Peak rejection level:	41.667%
Peak search sensitivity:	3
Sample Size:	1.9810E+03
Activity scaling factor:	1.0000E+06/(1.0000E+00* 1.9810E+03) = 5.0480E+02
Detection limit method:	Nureg 4.16
Random error:	1.0000000E+00
Systematic error:	1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	24-Jul-2006 08:37:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	101_150K_28APR05.Pbc 01-May-2005 05:24:47
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 10 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.5107

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
75.09	134.	31.28	1.50	1.654E-02	72.87	6.400	PBC<MDA	HG203
					74.81	9.600	PBC<MDA	PB212
77.11	236.	17.67	1.50	1.720E-02	77.11	10.700	8.748E-01	PB214
					77.11	17.500	5.349E-01	PB212
77.11	240.	17.67	1.50	1.720E-02	77.11	10.700	8.748E-01	PB214
					77.11	17.500	5.433E-01	PB212
87.66	71.	37.15	1.01	1.927E-02	86.45	32.740	7.779E-02	EU155
					88.04	3.790	PBC<MDA	CD109
92.98	97.	26.81	1.02	1.991E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
104.94	97.	35.61	1.78	2.078E-02				
104.94	97.	35.61	1.78	2.078E-02	105.31	21.800	1.466E-01	EU155
129.28	84.	30.02	1.68	2.109E-02				
186.43	80.	26.37	1.08	1.857E-02	185.99	3.280	8.980E-01	RA226
209.40	81.	36.27	1.03	1.721E-02				
238.97	557.	4.98	1.12	1.556E-02	238.63	43.100	5.599E-01	PB212
					241.92	7.470	3.300E+00	PB214
242.08	82.	24.01	1.12	1.539E-02				
270.64	72.	32.31	1.49	1.398E-02				
295.63	125.	12.87	1.16	1.290E-02	295.22	19.200	3.389E-01	PB214
300.50	43.	31.59	1.16	1.271E-02				
338.52	120.	16.98	1.44	1.135E-02	338.40	12.010	5.921E-01	AC228
352.38	180.	12.68	1.20	1.091E-02	351.99	37.100	3.000E-01	PB214
511.38	77.	22.40	1.29	7.581E-03	510.72	22.500	2.435E-01	TL208
583.99	203.	10.20	1.36	6.675E-03	583.14	86.000	2.376E-01	TL208
609.83	166.	11.79	1.25	6.408E-03	609.32	46.090	3.817E-01	BI214
727.78	31.	31.31	1.50	5.443E-03	727.17	11.800	3.274E-01	BI212

796.15	29.	30.34	1.50	5.016E-03	795.76	85.400	4.580E-02	CS134
911.88	104.	15.20	2.15	4.443E-03	911.07	29.000	5.419E-01	AC228
967.07	104.	14.17	1.21	4.219E-03				
1120.61	72.	23.96	0.68	3.711E-03	1120.28	15.040	8.778E-01	BI214
1462.00	571.	4.31	1.93	2.940E-03	1460.75	10.700	1.232E+01	K40
1765.81	31.	17.96	1.60	2.480E-03	1764.51	15.920	5.278E-01	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
174.89	87.65	315.	71.	0.036	111.45	1.014	PB-214	D
185.53	92.97	289.	97.	0.048	80.44	1.018	TH-234	D
209.47	104.94	461.	97.	0.049	106.82	1.782	U-235	l
258.17	129.28	262.	98.	0.049	76.39	1.677	AC-228	s
418.48	209.40	299.	81.	0.040	108.80	1.028	AC-228	s
477.64	238.93	107.	557.	0.279	14.95	1.122	PB-212	D
483.87	242.05	155.	82.	0.041	72.03	1.124	PB-214	D
541.00	270.64	190.	72.	0.036	96.93	1.486	AC-228	s
600.75	300.50	71.	43.	0.022	94.77	1.165	PB-212	lD
1934.55	967.07	45.	88.	0.044	45.37	1.213	TB-160	s

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-212	149.75	75.09	890.	134.	0.067	93.85	1.499s
PB-214	153.79	77.11	781.	236.	0.118	53.00	1.499D
PB-212	153.79	77.11	777.	240.	0.120	53.00	1.499D
TH-234	185.67	93.04	742.	111.	0.056	101.79	1.499s
RA-226	372.42	186.38	391.	92.	0.046	96.64	1.499s
PB-212	477.62	238.96	325.	515.	0.257	19.61	1.499
PB-214	591.17	295.71	148.	120.	0.060	50.23	1.499s
AC-228	677.16	338.69	107.	103.	0.052	50.52	1.499s
PB-214	704.52	352.36	118.	163.	0.082	36.20	1.499s
TL-208	1022.70	511.38	92.	61.	0.030	67.19	1.287s
TL-208	1167.98	583.99	65.	200.	0.100	30.61	1.364s
BI-214	1219.70	609.83	64.	165.	0.083	35.37	1.250
BI-212	1455.71	727.78	34.	31.	0.015	93.93	1.499s
CS-134	1592.53	796.15	25.	29.	0.014	91.02	1.502
AC-228	1824.29	911.97	26.	79.	0.039	42.33	1.578s
BI-214	2241.80	1120.61	53.	72.	0.036	71.88	0.676s
K-40	2925.03	1462.00	11.	569.	0.284	12.94	1.931
BI-214	3533.19	1765.88	1.	23.	0.012	61.92	2.106s

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	Peak MDA Value pCi/gm	COMMENTS
BE-7		7.0735E-02					
			477.56	7.073E-02	&(	3.176E-01 9.28E-02	G
K-40		1.2322E+01					
			1460.75	1.232E+01	(P	3.978E-01 5.34E-01	G
MN-54		-1.2343E-03					
			834.81	-1.234E-03	&(P	3.437E-02 9.22E-03	G
CO-57		9.0251E-03					
			122.07	9.025E-03	%(	4.254E-02 1.27E-02	G K
			136.43	-1.547E-03	&	3.241E-01 9.58E-02	G
CO-60		-1.8545E-04					
			1332.51	-1.854E-04	&(P	6.052E-02 1.66E-02	G K
			1173.23	8.344E-03	& P	6.210E-02 1.77E-02	G K
Sr-85		-7.0664E-03					
			514.00	-7.066E-03	&(	4.710E-02 1.38E-02	G
Kr-85		-1.8744E+02					
			513.99	-1.874E+02	&(P	1.077E+03 3.13E+02	G
Y-88		2.9164E-03					
			1836.01	2.916E-03	%(	4.033E-02 1.03E-02	G K
			898.02	3.850E-03	& P	3.916E-02 1.08E-02	G
NB-94		-7.3247E-03					
			871.10	-7.325E-03	&(P	4.804E-02 1.37E-02	G K
			702.50	-7.303E-03	% P	4.201E-02 1.21E-02	G K
Ag-108M		-3.3906E-03					
			722.95	-3.391E-03	&(	4.213E-02 1.19E-02	G K
			614.37	-1.521E-02	% P	5.052E-02 1.50E-02	G
			433.93	1.139E-02	%	3.210E-02 9.56E-03	G
CD-109		3.5370E-02					
			88.04	3.537E-02	%(P	1.323E+00 3.94E-01	G
SN-113		-1.1084E-02					
			391.71	-1.108E-02	&(	6.190E-02 1.82E-02	G K
			255.04	-1.936E-01	% P	1.726E+00 5.09E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	2.3872E-03						
		427.95	2.387E-03	&(P	1.010E-01	2.86E-02	G K
		600.77	6.418E-02	% P	1.694E-01	5.04E-02	G
		636.15	5.224E-02	% P	3.327E-01	9.54E-02	G
		463.51	2.345E-01	% P	3.681E-01	1.13E-01	G
		176.29	-8.960E-03	& P	4.791E-01	1.40E-01	G
I-131	1.3278E-02						
		364.48	1.328E-02	&(	4.649E-02	1.38E-02	G K
		636.97	1.077E-01	%	5.206E-01	1.50E-01	G
		284.29	1.389E-03	%	6.389E-01	1.86E-01	G
CS-134	1.7181E-02						
		604.66	-7.859E-03	%(P	4.217E-02	1.22E-02	G K
		795.76	4.580E-02	(P	4.142E-02	1.41E-02	G
		569.29	-5.409E-03	% P	2.095E-01	5.81E-02	G
		801.84	2.078E-02	&	4.396E-01	1.22E-01	G
CS-137	8.5941E-03						
		661.62	8.594E-03	&(P	4.294E-02	1.23E-02	G
CE-139	-1.8785E-03						
		165.85	-1.878E-03	%(P	4.342E-02	1.28E-02	G
EU-152	2.2243E-02						
		121.78	2.224E-02	%(P	1.257E-01	3.76E-02	G K
		344.30	-1.326E-02	& P	1.336E-01	3.89E-02	G
		1408.08	-1.882E-03	% P	2.223E-01	5.84E-02	G
		964.00	1.446E-01	% P	4.198E-01	1.25E-01	G
		1112.07	-1.030E-01	% P	4.698E-01	1.36E-01	G
		778.90	-7.000E-02	% P	3.342E-01	9.66E-02	G
EU-154	2.1392E-02						
		123.10	2.139E-02	&(P	8.335E-02	2.50E-02	G K
		1274.80	1.931E-02	% P	1.552E-01	4.36E-02	G
		723.30	1.239E-02	& P	1.895E-01	5.29E-02	G
		1004.80	-5.627E-02	% P	2.938E-01	8.45E-02	G
EU-155	5.7886E-02						
		86.45	5.789E-02	&(	1.454E-01	4.39E-02	G K
		105.31	1.026E-01	%	1.790E-01	5.45E-02	G
HG-203	-2.5995E-03						
		279.17	-2.599E-03	&(	4.564E-02	1.34E-02	G K
		72.87	-7.976E-03	% P	1.001E+00	2.98E-01	G
		70.83	-5.168E-01	&	1.871E+00	5.63E-01	G
		82.50	-1.074E-02	%	1.630E+00	4.81E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	2.3883E-01						
		583.14	2.376E-01	*(P	4.772E-02	2.46E-02	G
		510.72	2.435E-01	(P	1.894E-01	6.90E-02	G
PB-212	5.3546E-01						
		238.63	5.229E-01	(P	8.812E-02	3.46E-02	G K
							Energy duplication
		77.11	5.433E-01	@(	3.005E-01	9.60E-02	G
		74.81	5.776E-01	&(P	6.090E-01	1.88E-01	G
PB-214	2.9311E-01						
		351.99	2.744E-01	*(P	8.963E-02	3.35E-02	G K
		295.22	3.293E-01	@(P	1.634E-01	5.60E-02	G
							Energy duplication
		77.11	8.748E-01	+ P	4.926E-01	1.57E-01	G
		241.92	1.405E-01	% P	5.700E-01	1.70E-01	G
BI-212	3.2739E-01						
		727.17	3.274E-01	(P	3.155E-01	1.05E-01	G K
		1620.56	3.255E-01	%	1.259E+00	3.52E-01	G
		785.42	3.781E-01	& P	1.958E+00	5.61E-01	G
BI-214	3.8723E-01						
		609.32	3.817E-01	(P	9.203E-02	4.53E-02	G K
		1764.51	4.032E-01	?(P	1.273E-01	8.48E-02	G
		1120.28	8.778E-01	+ P	4.485E-01	2.12E-01	G
RA-224	7.5635E-01						
		241.00	7.564E-01	&(P	1.058E+00	3.25E-01	G
RA-226	1.0270E+00						
		185.99	1.027E+00	(	1.062E+00	3.31E-01	G
AC-228	4.4566E-01						
		911.07	4.166E-01	(P	1.407E-01	6.02E-02	G K
		968.90	1.463E-02	% P	2.748E-01	7.63E-02	G
		338.40	5.157E-01	*(P	2.544E-01	8.87E-02	G
TH-227	-2.0056E-01						
		236.00	-2.006E-01	%(P	3.942E-01	1.20E-01	G K
		256.25	-1.218E-01	% P	5.171E-01	1.54E-01	G
PA-234	-4.2565E-02						
		98.44	-4.257E-02	%(	1.356E-01	4.08E-02	G K
		946.00	-5.724E-02	%	2.836E-01	8.23E-02	G
		131.28	-7.131E-02	%	1.957E-01	5.90E-02	G
		94.67	-6.128E-02	&	2.952E-01	8.85E-02	G
		883.24	1.338E-01	%	3.335E-01	9.97E-02	G
		926.70	-4.814E-02	%	3.898E-01	1.10E-01	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26-9.794E-03 %   3.114E-01 8.72E-02 G

TH-234       8.8841E-01
                           63.29 5.932E-01 %(P 1.887E+00 5.66E-01 G K
                           92.80 1.272E+00 *(P 1.482E+00 4.56E-01 G
                           92.38-2.306E-01 % P 1.869E+00 5.54E-01 G

AM-241       7.3207E-03
                           59.54 7.321E-03 &(P 2.271E-01 6.72E-02 G
   ( - This peak used in the nuclide activity average.

   * - Peak is too wide, but only one peak in library.
   ! - Peak is part of a multiplet and this area went
       negative during deconvolution.
   ? - Peak is too narrow.
   @ - Peak is too wide at FW25M, but ok at FWHM.
   % - Peak fails sensitivity test.
   $ - Peak identified, but first peak of this nuclide
       failed one or more qualification tests.
   + - Peak activity higher than counting uncertainty range.
   - - Peak activity lower than counting uncertainty range.
   = - Peak outside analysis energy range.
   & - Calculated peak centroid is not close enough to the
       library energy centroid for positive identification.
   P - Peakbackground subtraction
   } - Peak is too close to another for the activity
       to be found directly.

   Nuclide Codes:                      Peak Codes:
   T - Thermal Neutron Activation      G - Gamma Ray
   F - Fast Neutron Activation         X - X-Ray
   I - Fission Product                 P - Positron Decay
   N - Naturally Occurring Isotope     S - Single-Escape
   P - Photon Reaction                 D - Double-Escape
   C - Charged Particle Reaction       K - Key Line
   M - No MDA Calculation              A - Not in Average
   R - Coincidence Corrected           C - Coincidence Peak
   H - Halflife limit exceeded

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
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***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	6.9441E-02	7.0735E-02	2.7831E-01	2.7833E-01	3.118E-01
K-40		1.2322E+01	1.2322E+01	1.6014E+00	1.7462E+00	
MN-54	#A	-1.2304E-03	-1.2343E-03	7.9140E-02	7.9140E-02	3.426E-02
CO-57	#B	8.9922E-03	9.0251E-03	3.8204E-02	3.8208E-02	4.239E-02
CO-60	#B	-1.8535E-04	-1.8545E-04	8.6225E-03	8.6225E-03	6.048E-02

Sr-85	#A	-6.9598E-03	-7.0664E-03	4.1320E-02	4.1322E-02	4.639E-02
Kr-85	#A	-1.8744E+02	-1.8744E+02	1.2260E+03	1.2261E+03	1.077E+03
Y-88	#B	2.8895E-03	2.9164E-03	3.0829E-02	3.0830E-02	3.996E-02
NB-94	#B	-7.3247E-03	-7.3247E-03	4.3475E-02	4.3477E-02	4.804E-02
Ag-108M	#B	-3.3906E-03	-3.3906E-03	3.5557E-02	3.5557E-02	4.213E-02
CD-109	#A	3.5293E-02	3.5370E-02	1.1829E+00	1.1829E+00	1.320E+00
SN-113	#B	-1.0989E-02	-1.1084E-02	5.4671E-02	5.4674E-02	6.137E-02
SB-125	#B	2.3849E-03	2.3872E-03	8.5881E-02	8.5881E-02	1.009E-01
I-131	#B	1.1746E-02	1.3278E-02	4.1422E-02	4.1429E-02	4.112E-02
CS-134	#B	1.7158E-02	1.7181E-02	1.5866E-02	1.5895E-02	4.211E-02
CS-137	#A	8.5933E-03	8.5941E-03	3.6988E-02	3.6991E-02	4.294E-02
CE-139	#A	-1.8651E-03	-1.8785E-03	4.4857E-02	4.4857E-02	4.311E-02
EU-152	#B	2.2238E-02	2.2243E-02	1.1265E-01	1.1266E-01	1.257E-01
EU-154	#B	2.1385E-02	2.1392E-02	7.4918E-02	7.4927E-02	8.333E-02
EU-155	#B	5.7854E-02	5.7886E-02	1.3184E-01	1.3188E-01	1.453E-01
HG-203	#B	-2.5451E-03	-2.5995E-03	4.0185E-02	4.0186E-02	4.469E-02
TL-208	#	2.3883E-01	2.3883E-01	7.3965E-02	7.5186E-02	
PB-212	#	5.3546E-01	5.3546E-01	1.0626E-01	1.1048E-01	8.812E-02
PB-214	#	2.9311E-01	2.9311E-01	9.2002E-02	9.3481E-02	8.963E-02
BI-212	#	3.2739E-01	3.2739E-01	3.1427E-01	3.1481E-01	3.155E-01
BI-214		3.8723E-01	3.8723E-01	1.3786E-01	1.3959E-01	
RA-224	#A	7.5635E-01	7.5635E-01	9.7502E-01	9.7596E-01	1.058E+00
RA-226	#A	1.0270E+00	1.0270E+00	9.9248E-01	9.9417E-01	1.062E+00
AC-228	#	4.4566E-01	4.4566E-01	1.5013E-01	1.5223E-01	1.407E-01
TH-227	#B	-2.0056E-01	-2.0056E-01	3.6510E-01	3.6527E-01	3.942E-01
PA-234	#B	-4.2565E-02	-4.2565E-02	1.2230E-01	1.2232E-01	1.356E-01
TH-234	#B	8.8841E-01	8.8841E-01	9.5457E-01	9.5584E-01	1.887E+00
AM-241	#A	7.3207E-03	7.3207E-03	2.0163E-01	2.0163E-01	2.271E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (270.6 to 1999.1 keV) 1.2948244E+01 pCi/gm
Total Decayed Activity (270.6 to 1999.1 keV) 1.2948244E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
DAT

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 101F_25JUL2006_1923.An1

Sample description
FSS-OOL-05-05-014-F

Spectrum Filename: C:\GammaVision\Spectra\101F_25JUL2006_1923.An1

Acquisition information

Start time:	25-Jul-2006 19:23:07
Live time:	2000
Real time:	2001
Dead time:	0.07 %
Detector ID:	1

Detector system
Det 101- DSPE-633

Calibration

Filename:	D1_1LSa.Clb

Detector 101 1.0 Liter Marinelli Sand

Energy Calibration

Created:	03-Sep-2004 08:50:48
Zero offset:	0.244 keV
Gain:	0.500 keV/channel
Quadratic:	-2.493E-08 keV/channel^2

Efficiency Calibration

Created:	03-Sep-2004 08:52:26
Type:	Polynomial
Uncertainty:	0.626 %
Coefficients:	-0.321775 -5.816463 0.734234
	-0.099357 0.006049 -0.000149

Library Files

Main analysis library:	FSS_Rev_1.Lib
Library Match Width:	1.000
Peak stripping:	Library based

Analysis parameters

Analysis engine:	Env32 G53W4.20
Start channel:	100 (50.23keV)
Stop channel:	4000 (1999.11keV)
Peak rejection level:	41.667%
Peak search sensitivity:	3
Sample Size:	2.0480E+03
Activity scaling factor:	1.0000E+06/(1.0000E+00* 2.0480E+03) = 4.8828E+02
Detection limit method:	Nureg 4.16
Random error:	1.0000000E+00
Systematic error:	1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	24-Jul-2006 08:05:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	101_150K_28APR05.Pbc 01-May-2005 05:24:47
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 12 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.5348

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
74.93	147.	27.95	1.50	1.654E-02				
74.93	147.	27.95	1.50	1.654E-02	74.81	9.600	6.096E-01	PB212
77.07	204.	19.89	1.50	1.720E-02	77.11	10.700	7.311E-01	PB214
					77.11	17.500	PBC<MDA	PB212
77.07	208.	19.89	1.50	1.720E-02	77.11	10.700	7.311E-01	PB214
					77.11	17.500	4.552E-01	PB212
92.90	97.	36.92	1.50	1.989E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
92.94	92.	37.35	1.50	1.985E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
185.85	126.	23.39	1.26	1.859E-02				
185.85	126.	23.39	1.26	1.859E-02	185.99	3.280	1.364E+00	RA226
239.02	442.	5.91	1.12	1.555E-02	238.63	43.100	4.286E-01	PB212
242.02	82.	22.69	1.12	1.540E-02	241.00	3.900	PBC<MDA	RA224
					241.92	7.470	PBC<MDA	PB214
270.40	53.	36.41	1.29	1.400E-02				
295.51	110.	16.86	1.07	1.291E-02	295.22	19.200	2.876E-01	PB214
328.51	54.	32.95	1.02	1.168E-02				
338.95	147.	15.41	1.20	1.133E-02	338.40	12.010	7.010E-01	AC228
352.15	197.	12.15	1.30	1.092E-02	351.99	37.100	3.172E-01	PB214
463.21	31.	35.35	1.50	8.342E-03	463.51	10.000	PBC<MDA	SB125
510.85	83.	19.40	1.51	7.589E-03	510.72	22.500	2.588E-01	TL208
583.69	174.	12.15	1.36	6.679E-03	583.14	86.000	1.965E-01	TL208
609.84	175.	11.54	1.68	6.408E-03	609.32	46.090	3.891E-01	BI214
727.69	42.	26.69	2.61	5.443E-03	727.17	11.800	4.286E-01	BI212
786.61	19.	41.52	1.50	5.075E-03	785.42	2.000	PBC<MDA	BI212
795.48	32.	35.51	1.08	5.018E-03				

795.48	32.	35.51	1.08	5.018E-03	795.76	85.400	4.902E-02	CS134
861.01	51.	29.48	1.01	4.675E-03				
911.92	109.	14.70	1.16	4.443E-03	911.07	29.000	5.472E-01	AC228
968.81	90.	17.33	1.03	4.212E-03	968.90	17.460	7.993E-01	AC228
1120.59	49.	24.57	0.82	3.711E-03	1120.28	15.040	5.748E-01	BI214

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
1461.93	585.	4.23	1.84	2.940E-03	1460.75	10.700	1.220E+01	K40
1765.94	30.	22.97	2.52	2.481E-03	1764.51	15.920	4.938E-01	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
477.74	239.00	121.	442.	0.221	17.74	1.122	PB-212	D
483.75	242.00	131.	82.	0.041	68.08	1.124	PB-214	D
540.53	270.40	148.	53.	0.027	109.24	1.293	AC-228	
656.80	328.51	105.	54.	0.027	98.84	1.021	RH-106M	s
1591.18	795.48	31.	32.	0.016	106.54	1.084	CS-134	l
1722.32	861.01	50.	51.	0.026	72.28	1.013	TL-208	s

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-212	149.44	74.93	831.	147.	0.073	83.85	1.499s
PB-214	153.79	77.11	753.	204.	0.102	59.67	1.499D
PB-212	153.79	77.11	749.	208.	0.104	59.67	1.499D
TH-234	185.39	92.90	676.	97.	0.048	110.77	1.499
RA-226	372.10	186.22	353.	109.	0.054	78.87	1.499s
PB-212	477.76	239.03	297.	415.	0.208	22.55	1.499
PB-214	590.70	295.48	176.	119.	0.059	53.80	1.499
AC-228	677.66	338.94	120.	142.	0.071	45.86	1.199
PB-214	704.56	352.38	101.	177.	0.088	32.57	1.499
SB-125	926.31	463.21	50.	31.	0.015	106.05	1.499
TL-208	1022.50	511.28	89.	44.	0.022	71.88	1.499s
TL-208	1167.60	583.79	59.	144.	0.072	32.96	1.499
BI-214	1219.72	609.84	63.	174.	0.087	34.61	1.683s
BI-212	1455.54	727.69	31.	42.	0.021	80.07	2.606s
AC-228	1824.20	911.92	45.	107.	0.053	44.09	1.162s
AC-228	1938.04	968.81	38.	89.	0.045	52.00	1.033s
BI-214	2241.77	1120.59	32.	49.	0.024	73.72	0.823s
K-40	2924.87	1461.93	9.	582.	0.291	12.69	1.839
BI-214	3533.33	1765.94	5.	30.	0.015	68.92	2.516

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	Peak MDA Value pCi/gm	COMMENTS
BE-7		1.5415E-01					
			477.56	1.541E-01	%(	2.951E-01 9.01E-02	G
K-40		1.2204E+01					
			1460.75	1.220E+01	(P	3.445E-01 5.19E-01	G
MN-54		-2.0159E-04					
			834.81	-2.016E-04	&(P	3.720E-02 1.01E-02	G
CO-57		-1.2029E-02					
			122.07	-1.203E-02	&(	4.131E-02 1.24E-02	G K
			136.43	-3.754E-03	%	3.331E-01 9.87E-02	G
CO-60		1.5037E-03					
			1332.51	1.504E-03	%(P	5.444E-02 1.49E-02	G K
			1173.23	2.340E-02	% P	5.326E-02 1.60E-02	G K
Sr-85		-1.5625E-02					
			514.00	-1.563E-02	&(	4.957E-02 1.48E-02	G
Kr-85		-3.7906E+02					
			513.99	-3.791E+02	&(P	1.131E+03 3.36E+02	G
Y-88		-5.4309E-03					
			1836.01	-5.431E-03	%(	4.116E-02 1.09E-02	G K
			898.02	1.370E-02	& P	4.032E-02 1.19E-02	G
NB-94		-1.1634E-03					
			871.10	-1.163E-03	%(P	3.797E-02 1.04E-02	G K
			702.50	5.408E-03	% P	3.286E-02 9.35E-03	G K
Ag-108M		-1.2518E-02					
			722.95	-1.252E-02	%(	5.055E-02 1.48E-02	G K
			614.37	-3.071E-03	% P	4.066E-02 1.15E-02	G
			433.93	-3.695E-03	%	3.989E-02 1.16E-02	G
CD-109		-2.2118E-01					
			88.04	-2.212E-01	&(P	1.280E+00 3.83E-01	G
SN-113		5.7273E-03					
			391.71	5.727E-03	&(	5.055E-02 1.47E-02	G K
			255.04	1.918E-02	% P	1.676E+00 4.91E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	6.2516E-02						
		427.95	1.827E-03	%(P	1.236E-01	3.55E-02	G K
		600.77	3.325E-02	% P	2.003E-01	5.78E-02	G
		636.15	4.900E-02	& P	2.971E-01	8.49E-02	G
		463.51	2.422E-01	(P	2.811E-01	8.97E-02	G
		176.29	-4.623E-04	% P	5.504E-01	1.62E-01	G
I-131	-7.1299E-03						
		364.48	-7.130E-03	%(	4.721E-02	1.38E-02	G K
		636.97	6.028E-02	&	5.915E-01	1.69E-01	G
		284.29	-1.513E-01	%	5.912E-01	1.76E-01	G
CS-134	-5.0327E-03						
		604.66	-5.033E-03	%(P	4.193E-02	1.20E-02	G K
		795.76	2.603E-02	% P	3.944E-02	1.24E-02	G
		569.29	4.593E-02	& P	2.423E-01	7.03E-02	G
		801.84	1.283E-01	%	3.411E-01	1.01E-01	G
CS-137	-5.3935E-03						
		661.62	-5.393E-03	%(P	4.742E-02	1.34E-02	G
CE-139	-7.2981E-03						
		165.85	-7.298E-03	%(P	4.303E-02	1.28E-02	G
EU-152	4.8250E-03						
		121.78	4.825E-03	&(P	9.971E-02	2.95E-02	G K
		344.30	-2.303E-02	% P	1.266E-01	3.72E-02	G
		1408.08	1.011E-02	% P	2.221E-01	5.97E-02	G
		964.00	3.396E-02	% P	3.730E-01	1.06E-01	G
		1112.07	-1.633E-02	& P	3.804E-01	1.05E-01	G
		778.90	-1.332E-02	& P	3.120E-01	8.71E-02	G
EU-154	-2.5417E-02						
		123.10	-2.542E-02	%(P	9.225E-02	2.77E-02	G K
		1274.80	-2.508E-02	% P	1.558E-01	4.43E-02	G
		723.30	-6.258E-02	% P	2.363E-01	6.92E-02	G
		1004.80	1.577E-02	& P	2.234E-01	6.14E-02	G
EU-155	7.4924E-02						
		86.45	7.492E-02	%(	1.381E-01	4.20E-02	G K
		105.31	1.966E-02	%	1.688E-01	5.03E-02	G
HG-203	2.5042E-02						
		279.17	2.504E-02	&(	3.709E-02	1.14E-02	G K
		72.87	-4.064E-01	% P	1.048E+00	3.16E-01	G
		70.83	-9.427E-01	&	1.718E+00	5.22E-01	G
		82.50	-3.973E-01	%	2.028E+00	6.07E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	1.6615E-01						
		583.14	1.654E-01	(P	4.406E-02	1.85E-02	G
		510.72	1.691E-01	*(P	1.801E-01	5.54E-02	G
PB-212	4.2160E-01						
		238.63	4.080E-01	(P	8.154E-02	3.11E-02	G K
							Energy duplication
		77.11	4.552E-01	@(	2.855E-01	9.05E-02	G
		74.81	6.096E-01	& P	5.695E-01	1.76E-01	G
PB-214	2.9763E-01						
		351.99	2.880E-01	(P	8.072E-02	3.16E-02	G K
		295.22	3.162E-01	(P	1.714E-01	5.75E-02	G
							Energy duplication
		77.11	7.311E-01	+ P	4.681E-01	1.48E-01	G
		241.92	-1.768E-02	% P	6.114E-01	1.81E-01	G
BI-212	4.2864E-01						
		727.17	4.286E-01	(P	2.956E-01	1.16E-01	G K
		1620.56	-1.728E-01	%	1.410E+00	3.75E-01	G
		785.42	1.210E+00	% P	1.579E+00	5.09E-01	G
BI-214	4.1598E-01						
		609.32	3.891E-01	(P	8.843E-02	4.52E-02	G K
		1764.51	4.938E-01	(P	2.268E-01	1.15E-01	G
		1120.28	5.748E-01	+ P	3.456E-01	1.42E-01	G
RA-224	1.8740E-01						
		241.00	1.874E-01	&(P	1.018E+00	3.03E-01	G
RA-226	1.1757E+00						
		185.99	1.176E+00	@(	9.776E-01	3.09E-01	G
AC-228	6.5127E-01						
		911.07	5.472E-01	@(P	1.739E-01	8.19E-02	G K
		968.90	7.993E-01	@(P	2.818E-01	1.40E-01	G
		338.40	6.874E-01	(P	2.602E-01	1.07E-01	G
TH-227	-1.0672E-01						
		236.00	-1.067E-01	%(P	3.417E-01	1.02E-01	G K
		256.25	8.262E-02	& P	4.664E-01	1.38E-01	G
PA-234	-3.8575E-02						
		98.44	-3.858E-02	&(	1.358E-01	4.08E-02	G K
		946.00	-8.476E-03	&	2.195E-01	6.09E-02	G
		131.28	3.705E-02	&	1.827E-01	5.47E-02	G
		94.67	-8.289E-02	%	2.683E-01	8.08E-02	G
		883.24	8.630E-02	%	2.907E-01	8.47E-02	G
		926.70	-8.987E-03	&	3.192E-01	8.63E-02	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26 7.212E-02 &   3.577E-01 1.04E-01 G

TH-234       5.9569E-01
                           63.29 2.317E-01 %(P 1.827E+00 5.43E-01 G K
                           92.80 1.069E+00  (P 1.369E+00 4.20E-01 G
                           92.38 1.191E+00 % P 1.628E+00 4.97E-01 G

AM-241      -1.1489E-02
                           59.54-1.149E-02 &(P 2.464E-01 7.31E-02 G
   ( - This peak used in the nuclide activity average.

   * - Peak is too wide, but only one peak in library.
   ! - Peak is part of a multiplet and this area went
       negative during deconvolution.
   ? - Peak is too narrow.
   @ - Peak is too wide at FW25M, but ok at FWHM.
   % - Peak fails sensitivity test.
   $ - Peak identified, but first peak of this nuclide
       failed one or more qualification tests.
   + - Peak activity higher than counting uncertainty range.
   - - Peak activity lower than counting uncertainty range.
   = - Peak outside analysis energy range.
   & - Calculated peak centroid is not close enough to the
       library energy centroid for positive identification.
   P - Peakbackground subtraction
   } - Peak is too close to another for the activity
       to be found directly.

   Nuclide Codes:                      Peak Codes:
   T - Thermal Neutron Activation      G - Gamma Ray
   F - Fast Neutron Activation         X - X-Ray
   I - Fission Product                 P - Positron Decay
   N - Naturally Occurring Isotope     S - Single-Escape
   P - Photon Reaction                 D - Double-Escape
   C - Charged Particle Reaction       K - Key Line
   M - No MDA Calculation              A - Not in Average
   R - Coincidence Corrected           C - Coincidence Peak
   H - Halflife limit exceeded

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
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***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	1.5123E-01	1.5415E-01	2.7031E-01	2.7045E-01	2.895E-01
K-40		1.2204E+01	1.2204E+01	1.5547E+00	1.7008E+00	
MN-54	#A	-2.0093E-04	-2.0159E-04	6.2985E-02	6.2985E-02	3.708E-02
CO-57	#B	-1.1983E-02	-1.2029E-02	3.7247E-02	3.7253E-02	4.116E-02
CO-60	#B	1.5029E-03	1.5037E-03	4.4730E-02	4.4730E-02	5.441E-02

Sr-85	#A	-1.5382E-02	-1.5625E-02	4.4362E-02	4.4371E-02	4.879E-02
Kr-85	#A	-3.7906E+02	-3.7906E+02	1.1440E+03	1.1442E+03	1.131E+03
Y-88	#B	-5.3792E-03	-5.4309E-03	3.2722E-02	3.2723E-02	4.077E-02
NB-94	#B	-1.1634E-03	-1.1634E-03	4.3357E-02	4.3357E-02	3.797E-02
Ag-108M	#B	-1.2518E-02	-1.2518E-02	4.4458E-02	4.4464E-02	5.055E-02
CD-109	#A	-2.2068E-01	-2.2118E-01	1.1951E+00	1.1952E+00	1.277E+00
SN-113	#B	5.6767E-03	5.7273E-03	4.4044E-02	4.4046E-02	5.011E-02
SB-125	#B	6.2453E-02	6.2516E-02	6.9434E-02	6.9523E-02	1.235E-01
I-131	#B	-6.2807E-03	-7.1299E-03	4.1506E-02	4.1508E-02	4.159E-02
CS-134	#B	-5.0259E-03	-5.0327E-03	4.6634E-02	4.6635E-02	4.187E-02
CS-137	#A	-5.3930E-03	-5.3935E-03	6.2278E-02	6.2279E-02	4.741E-02
CE-139	#A	-7.2441E-03	-7.2981E-03	3.9962E-02	3.9964E-02	4.271E-02
EU-152	#B	4.8240E-03	4.8250E-03	8.8362E-02	8.8362E-02	9.969E-02
EU-154	#B	-2.5409E-02	-2.5417E-02	8.7801E-02	8.7813E-02	9.222E-02
EU-155	#B	7.4882E-02	7.4924E-02	1.2602E-01	1.2609E-01	1.381E-01
HG-203	#B	2.4500E-02	2.5042E-02	3.4328E-02	3.4357E-02	3.629E-02
TL-208	#	1.6615E-01	1.6615E-01	5.5666E-02	5.6453E-02	4.406E-02
PB-212	#	4.2160E-01	4.2160E-01	9.6464E-02	9.9362E-02	8.154E-02
PB-214	#	2.9763E-01	2.9763E-01	9.4898E-02	9.6377E-02	8.072E-02
BI-212	#	4.2864E-01	4.2864E-01	3.4881E-01	3.4965E-01	
BI-214		4.1598E-01	4.1598E-01	1.4489E-01	1.4678E-01	
RA-224	#A	1.8740E-01	1.8740E-01	9.0943E-01	9.0949E-01	1.018E+00
RA-226	#	1.1757E+00	1.1757E+00	9.2731E-01	9.2969E-01	9.776E-01
AC-228		6.5127E-01	6.5127E-01	1.8070E-01	1.8441E-01	
TH-227	#B	-1.0672E-01	-1.0672E-01	3.1702E-01	3.1708E-01	3.417E-01
PA-234	#B	-3.8575E-02	-3.8575E-02	1.2229E-01	1.2231E-01	1.358E-01
TH-234	#B	5.9569E-01	5.9569E-01	7.0203E-01	7.0281E-01	1.827E+00
AM-241	#A	-1.1489E-02	-1.1489E-02	3.0559E-01	3.0559E-01	2.464E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (270.1 to 1999.1 keV) 1.3699981E+01 pCi/gm
Total Decayed Activity (270.1 to 1999.1 keV) 1.3699981E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
DAT

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 101F_25JUL2006_2000.An1

Sample description
FSS-OOL-05-05-008-F

Spectrum Filename: C:\GammaVision\Spectra\101F_25JUL2006_2000.An1

Acquisition information
Start time: 25-Jul-2006 20:00:29
Live time: 2000
Real time: 2002
Dead time: 0.08 %
Detector ID: 1

Detector system
Det 101- DSPE-633

Calibration
Filename: D1_1LSa.Clb
Detector 101 1.0 Liter Marinelli Sand

Energy Calibration
Created: 03-Sep-2004 08:50:48
Zero offset: 0.244 keV
Gain: 0.500 keV/channel
Quadratic: -2.493E-08 keV/channel^2

Efficiency Calibration
Created: 03-Sep-2004 08:52:26
Type: Polynomial
Uncertainty: 0.626 %
Coefficients: -0.321775 -5.816463 0.734234
-0.099357 0.006049 -0.000149

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.23keV)
Stop channel: 4000 (1999.11keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 1.8640E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.8640E+03) =
5.3648E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	24-Jul-2006 08:25:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	101_150K_28APR05.Pbc 01-May-2005 05:24:47
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 13 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.5110

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
74.91	168.	28.58	1.50	1.654E-02				
74.91	168.	28.58	1.50	1.654E-02	74.81	9.600	7.672E-01	PB212
77.13	339.	14.01	1.50	1.720E-02	77.11	10.700	1.335E+00	PB214
					77.11	17.500	8.164E-01	PB212
77.13	343.	14.01	1.50	1.720E-02	77.11	10.700	1.335E+00	PB214
					77.11	17.500	8.254E-01	PB212
93.12	103.	39.78	1.50	1.989E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
186.14	110.	27.42	1.25	1.857E-02	185.99	3.280	1.312E+00	RA226
208.99	82.	36.11	1.05	1.723E-02				
238.98	766.	4.27	1.12	1.556E-02	238.63	43.100	8.202E-01	PB212
242.15	116.	18.57	1.12	1.539E-02	241.00	3.900	1.387E+00	RA224
					241.92	7.470	PBC<MDA	PB214
270.36	107.	21.65	1.29	1.400E-02				
277.89	53.	41.60	1.21	1.366E-02				
295.59	188.	10.24	1.16	1.291E-02	295.22	19.200	5.437E-01	PB214
300.37	56.	27.39	1.16	1.272E-02				
338.77	171.	14.69	1.07	1.134E-02	338.40	12.010	9.000E-01	AC228
352.35	265.	10.44	1.25	1.091E-02	351.99	37.100	4.701E-01	PB214
463.40	43.	30.63	1.50	8.342E-03	463.51	10.000	3.724E-01	SB125
511.44	98.	18.63	1.49	7.580E-03	510.72	22.500	3.492E-01	TL208
583.77	215.	9.29	1.60	6.678E-03	583.14	86.000	2.679E-01	TL208
609.99	211.	9.22	1.25	6.406E-03	609.32	46.090	5.139E-01	BI214
727.79	60.	24.65	1.06	5.439E-03	727.17	11.800	6.651E-01	BI212
861.04	32.	40.15	1.00	4.675E-03				
912.09	152.	10.65	1.35	4.442E-03	911.07	29.000	8.463E-01	AC228
968.98	128.	14.01	1.59	4.212E-03	968.90	17.460	1.252E+00	AC228

1121.26	61.	26.27	1.43	3.708E-03	1120.28	15.040	7.900E-01	BI214
1462.00	718.	3.87	1.55	2.940E-03	1460.75	10.700	1.649E+01	K40
1765.94	29.	18.57	2.00	2.481E-03	1764.51	15.920	5.242E-01	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
417.66	208.99	335.	82.	0.041	108.34	1.051	AC-228	s
477.66	238.98	151.	766.	0.383	12.80	1.122	PB-212	D
484.00	242.15	174.	116.	0.058	55.72	1.124	PB-214	D
540.45	270.36	181.	107.	0.054	64.96	1.292	AC-228	s
600.39	300.32	122.	56.	0.028	94.84	1.036	PB-212	s
1722.37	861.04	48.	32.	0.016	120.44	0.998	TL-208	s

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-212	149.39	74.91	1145.	168.	0.084	85.73	1.499s
PB-214	153.79	77.11	986.	339.	0.170	42.03	1.499D
PB-212	153.79	77.11	982.	343.	0.171	42.03	1.499D
RA-226	372.20	186.27	479.	102.	0.051	95.49	1.499s
PB-212	477.69	239.00	431.	655.	0.327	17.65	1.499
RA-224	483.43	241.86	462.	90.	0.045	105.62	1.499
PB-214	591.01	295.63	188.	184.	0.092	38.23	1.499s
AC-228	677.32	338.77	162.	169.	0.085	44.08	1.069
PB-214	704.53	352.37	133.	230.	0.115	28.73	1.499
SB-125	926.70	463.40	71.	43.	0.021	91.88	1.499s
TL-208	1022.82	511.44	98.	82.	0.041	55.88	1.492s
TL-208	1167.55	583.77	60.	212.	0.106	27.86	1.600
BI-214	1220.02	609.99	61.	209.	0.105	27.66	1.248
BI-212	1455.73	727.79	51.	59.	0.029	73.95	1.063
AC-228	1824.54	912.09	41.	151.	0.075	31.94	1.347s
AC-228	1938.38	968.98	50.	127.	0.063	42.02	1.593s
BI-214	2243.10	1121.26	60.	61.	0.030	78.82	1.432
K-40	2925.01	1462.00	15.	716.	0.358	11.61	1.554
BI-214	3533.31	1765.94	0.	29.	0.014	55.71	1.999

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Code	MDA Value pCi/gm	COMMENTS
BE-7		6.4271E-02					
			477.56	6.427E-02	%(	2.992E-01 8.69E-02	G
K-40		1.6485E+01					
			1460.75	1.649E+01	(P	4.791E-01 6.40E-01	G
MN-54		1.0092E-03					
			834.81	1.009E-03	%(P	5.199E-02 1.46E-02	G
CO-57		1.9043E-03					
			122.07	1.904E-03	&(	5.119E-02 1.52E-02	G K
			136.43	-8.274E-02	%	3.644E-01 1.09E-01	G
CO-60		-2.8825E-03					
			1332.51	-2.882E-03	%(P	5.239E-02 1.42E-02	G K
			1173.23	1.813E-02	& P	6.828E-02 2.00E-02	G K
Sr-85		-9.1198E-03					
			514.00	-9.120E-03	&(	5.343E-02 1.57E-02	G
Kr-85		-2.3321E+02					
			513.99	-2.332E+02	&(P	1.220E+03 3.57E+02	G
Y-88		-6.6496E-03					
			1836.01	-6.650E-03	%(	5.347E-02 1.44E-02	G K
			898.02	-5.351E-03	& P	5.312E-02 1.50E-02	G
NB-94		5.7383E-03					
			871.10	5.738E-03	&(P	4.632E-02 1.31E-02	G K
			702.50	1.017E-02	% P	4.597E-02 1.34E-02	G K
Ag-108M		5.6300E-03					
			722.95	5.630E-03	%(	5.349E-02 1.53E-02	G K
			614.37	-8.746E-03	& P	6.111E-02 1.78E-02	G
			433.93	-5.072E-03	%	4.350E-02 1.26E-02	G
CD-109		-7.8579E-02					
			88.04	-7.858E-02	%(P	1.560E+00 4.66E-01	G
SN-113		-1.9114E-02					
			391.71	-1.911E-02	%(	6.947E-02 2.07E-02	G K
			255.04	8.689E-03	% P	1.885E+00 5.52E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	1.0860E-01						
		427.95	1.949E-02	%(P	1.427E-01	4.17E-02	G K
		600.77	-6.364E-03	% P	2.051E-01	5.74E-02	G
		636.15	1.131E-01	& P	2.802E-01	8.36E-02	G
		463.51	3.724E-01	(P	3.655E-01	1.18E-01	G
		176.29	-2.360E-02	& P	5.130E-01	1.50E-01	G
I-131	1.8394E-02						
		364.48	1.839E-02	%(	4.800E-02	1.44E-02	G K
		636.97	-1.272E-01	%	7.555E-01	2.20E-01	G
		284.29	-1.527E-01	%	7.681E-01	2.28E-01	G
CS-134	-1.4499E-02						
		604.66	-1.450E-02	%(P	4.578E-02	1.35E-02	G K
		795.76	2.741E-02	% P	5.632E-02	1.71E-02	G
		569.29	4.178E-02	% P	3.041E-01	8.82E-02	G
		801.84	-1.016E-02	%	5.372E-01	1.50E-01	G
CS-137	-1.6890E-03						
		661.62	-1.689E-03	%(P	5.677E-02	1.59E-02	G
CE-139	1.4545E-04						
		165.85	1.454E-04	%(P	5.231E-02	1.55E-02	G
EU-152	-7.4272E-03						
		121.78	-7.427E-03	&(P	1.503E-01	4.47E-02	G K
		344.30	-3.943E-02	& P	1.518E-01	4.50E-02	G
		1408.08	7.804E-02	% P	1.852E-01	5.53E-02	G
		964.00	4.769E-03	& P	2.841E-01	7.65E-02	G
		1112.07	8.650E-02	& P	4.625E-01	1.33E-01	G
		778.90	6.543E-02	& P	3.258E-01	9.37E-02	G
EU-154	8.7621E-03						
		123.10	8.762E-03	%(P	1.076E-01	3.21E-02	G K
		1274.80	8.738E-03	% P	1.617E-01	4.46E-02	G
		723.30	-9.612E-03	% P	4.246E-01	1.23E-01	G
		1004.80	1.101E-01	& P	2.991E-01	8.89E-02	G
EU-155	1.3586E-02						
		86.45	1.359E-02	&(	1.826E-01	5.46E-02	G K
		105.31	3.317E-03	%	1.968E-01	5.85E-02	G
HG-203	-2.1649E-03						
		279.17	-2.165E-03	&(	5.133E-02	1.51E-02	G K
		72.87	-1.226E-02	& P	1.484E+00	4.44E-01	G
		70.83	-9.850E-01	%	2.138E+00	6.48E-01	G
		82.50	-4.542E-01	%	2.623E+00	7.86E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	2.6789E-01						
		583.14	2.679E-01	(P	4.878E-02	2.52E-02	G
		510.72	3.492E-01	+ P	2.071E-01	7.78E-02	G
PB-212	7.4469E-01						
		238.63	7.069E-01	(P	1.074E-01	4.20E-02	G K
							Energy duplication
		77.11	8.254E-01	@(	3.581E-01	1.16E-01	G
		74.81	7.672E-01	&(P	7.322E-01	2.26E-01	G
PB-214	4.1199E-01						
		351.99	4.120E-01	(P	1.011E-01	3.98E-02	G K
		295.22	5.365E-01	+ P	1.947E-01	6.90E-02	G
							Energy duplication
		77.11	1.335E+00	+ P	5.868E-01	1.89E-01	G
		241.92	-2.281E-02	% P	7.983E-01	2.37E-01	G
BI-212	6.6510E-01						
		727.17	6.651E-01	(P	4.065E-01	1.66E-01	G K
		1620.56	-7.382E-03	&	1.576E+00	3.98E-01	G
		785.42	2.165E-01	& P	2.459E+00	6.98E-01	G
BI-214	5.1651E-01						
		609.32	5.139E-01	(P	9.556E-02	4.77E-02	G K
		1764.51	5.242E-01	(P	1.353E-01	9.89E-02	G
		1120.28	7.900E-01	+ P	5.048E-01	2.09E-01	G
RA-224	1.0788E+00						
		241.00	1.079E+00	&(P	1.237E+00	3.83E-01	G
RA-226	1.2172E+00						
		185.99	1.217E+00	*(	1.246E+00	3.87E-01	G
AC-228	8.6204E-01						
		911.07	8.463E-01	*(P	1.839E-01	9.13E-02	G K
		968.90	1.252E+00	+ P	3.516E-01	1.76E-01	G
		338.40	9.000E-01	(P	3.297E-01	1.34E-01	G
TH-227	-1.5207E-01						
		236.00	-1.521E-01	%(P	4.645E-01	1.40E-01	G K
		256.25	-4.960E-02	& P	5.845E-01	1.72E-01	G
PA-234	-6.6845E-02						
		98.44	-6.684E-02	&(	1.623E-01	4.91E-02	G K
		946.00	-4.814E-02	&	2.995E-01	8.63E-02	G
		131.28	7.869E-02	&	1.932E-01	5.84E-02	G
		94.67	-1.222E-01	%	3.430E-01	1.04E-01	G
		883.24	1.471E-01	%	3.591E-01	1.08E-01	G
		926.70	1.399E-01	%	3.888E-01	1.15E-01	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26 6.310E-02 %   4.504E-01 1.31E-01 G

TH-234      -3.8145E-02
                           63.29-3.815E-02 %(P 1.910E+00 5.63E-01 G K
                           92.80 1.252E+00 % P 1.727E+00 5.28E-01 G
                           92.38-3.358E-01 % P 2.087E+00 6.20E-01 G

AM-241      -2.4330E-02
                           59.54-2.433E-02 &(P 2.962E-01 8.82E-02 G
   ( - This peak used in the nuclide activity average.

   * - Peak is too wide, but only one peak in library.
   ! - Peak is part of a multiplet and this area went
       negative during deconvolution.
   ? - Peak is too narrow.
   @ - Peak is too wide at FW25M, but ok at FWHM.
   % - Peak fails sensitivity test.
   $ - Peak identified, but first peak of this nuclide
       failed one or more qualification tests.
   + - Peak activity higher than counting uncertainty range.
   - - Peak activity lower than counting uncertainty range.
   = - Peak outside analysis energy range.
   & - Calculated peak centroid is not close enough to the
       library energy centroid for positive identification.
   P - Peakbackground subtraction
   } - Peak is too close to another for the activity
       to be found directly.

   Nuclide Codes:                      Peak Codes:
   T - Thermal Neutron Activation      G - Gamma Ray
   F - Fast Neutron Activation         X - X-Ray
   I - Fission Product                 P - Positron Decay
   N - Naturally Occurring Isotope     S - Single-Escape
   P - Photon Reaction                 D - Double-Escape
   C - Charged Particle Reaction       K - Key Line
   M - No MDA Calculation              A - Not in Average
   R - Coincidence Corrected           C - Coincidence Peak
   H - Halflife limit exceeded

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
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***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	6.3045E-02	6.4271E-02	2.6062E-01	2.6064E-01	2.935E-01
K-40		1.6485E+01	1.6485E+01	1.9193E+00	2.1334E+00	
MN-54	#A	1.0059E-03	1.0092E-03	4.3657E-02	4.3657E-02	5.182E-02
CO-57	#B	1.8970E-03	1.9043E-03	4.5687E-02	4.5687E-02	5.099E-02
CO-60	#B	-2.8809E-03	-2.8825E-03	4.8900E-02	4.8900E-02	5.236E-02

Sr-85	#A	-8.9763E-03	-9.1198E-03	4.7084E-02	4.7086E-02	5.259E-02
Kr-85	#A	-2.3321E+02	-2.3321E+02	1.3417E+03	1.3417E+03	1.220E+03
Y-88	#B	-6.5858E-03	-6.6496E-03	4.3268E-02	4.3270E-02	5.296E-02
NB-94	#B	5.7383E-03	5.7383E-03	3.9314E-02	3.9315E-02	4.632E-02
Ag-108M	#B	5.6299E-03	5.6300E-03	4.5900E-02	4.5901E-02	5.349E-02
CD-109	#A	-7.8401E-02	-7.8579E-02	1.5737E+00	1.5737E+00	1.556E+00
SN-113	#B	-1.8944E-02	-1.9114E-02	6.2019E-02	6.2028E-02	6.885E-02
SB-125	#B	1.0849E-01	1.0860E-01	1.0315E-01	1.0334E-01	1.426E-01
I-131	#B	1.6186E-02	1.8394E-02	4.3212E-02	4.3225E-02	4.224E-02
CS-134	#B	-1.4479E-02	-1.4499E-02	4.4634E-02	4.4642E-02	4.572E-02
CS-137	#A	-1.6889E-03	-1.6890E-03	3.4320E-01	3.4320E-01	5.676E-02
CE-139	#A	1.4437E-04	1.4545E-04	4.6485E-02	4.6485E-02	5.192E-02
EU-152	#B	-7.4256E-03	-7.4272E-03	1.7207E-01	1.7207E-01	1.503E-01
EU-154	#B	8.7592E-03	8.7621E-03	9.6222E-02	9.6223E-02	1.076E-01
EU-155	#B	1.3578E-02	1.3586E-02	1.6381E-01	1.6381E-01	1.825E-01
HG-203	#B	-2.1176E-03	-2.1649E-03	4.5229E-02	4.5229E-02	5.021E-02
TL-208		2.6789E-01	2.6789E-01	7.5463E-02	7.6966E-02	
PB-212	#	7.4469E-01	7.4469E-01	1.3266E-01	1.3917E-01	1.074E-01
PB-214	#	4.1199E-01	4.1199E-01	1.1937E-01	1.2162E-01	1.011E-01
BI-212		6.6510E-01	6.6510E-01	4.9750E-01	4.9892E-01	
BI-214		5.1651E-01	5.1651E-01	1.4360E-01	1.4654E-01	
RA-224	#A	1.0788E+00	1.0788E+00	1.1486E+00	1.1502E+00	1.237E+00
RA-226	#A	1.2172E+00	1.2172E+00	1.1623E+00	1.1643E+00	1.246E+00
AC-228		8.6204E-01	8.6204E-01	2.3762E-01	2.4256E-01	
TH-227	#B	-1.5207E-01	-1.5207E-01	4.2927E-01	4.2936E-01	4.645E-01
PA-234	#B	-6.6845E-02	-6.6845E-02	1.4720E-01	1.4725E-01	1.623E-01
TH-234	#B	-3.8145E-02	-3.8145E-02	2.9693E+00	2.9693E+00	1.910E+00
AM-241	#A	-2.4330E-02	-2.4330E-02	3.1401E-01	3.1401E-01	2.962E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (270.1 to 1999.1 keV) 1.8796669E+01 pCi/gm
Total Decayed Activity (270.1 to 1999.1 keV) 1.8796669E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
DAT

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 102F_24JUL2006_1730.An1

Sample description
FSS-OOL-05-05-002-F-S

Spectrum Filename: C:\GammaVision\Spectra\102F_24JUL2006_1730.An1

Acquisition information
Start time: 24-Jul-2006 17:30:08
Live time: 2000
Real time: 2020
Dead time: 0.98 %
Detector ID: 3

Detector system
Det 102 - DSPP-468

Calibration
Filename: D2_1LSa.Clb
DET 102 1 Liter Sand Geometry

Energy Calibration
Created: 15-Jan-2005 03:09:29
Zero offset: 0.220 keV
Gain: 0.500 keV/channel
Quadratic: -6.435E-08 keV/channel^2

Efficiency Calibration
Created: 15-Jan-2005 06:48:10
Type: Polynomial
Uncertainty: 0.497 %
Coefficients: -0.294180 -5.980622 0.744607
-0.096737 0.005214 -0.000120

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.22keV)
Stop channel: 4000 (1999.02keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 2.0210E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 2.0210E+03) =
4.9480E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	24-Jul-2006 10:04:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	102_150K_28APR05.Pbc 01-May-2005 05:27:47
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 12 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.7865

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
74.67	110.	39.22	1.50	8.847E-03	74.81	9.600	PBC<MDA	PB212
77.22	194.	23.45	1.50	9.541E-03	77.11	10.700	1.271E+00	PB214
					77.11	17.500	7.770E-01	PB212
77.22	194.	23.45	1.50	9.541E-03	77.11	10.700	1.271E+00	PB214
					77.11	17.500	7.770E-01	PB212
186.81	143.	23.11	1.82	1.623E-02	185.99	3.280	1.741E+00	RA226
239.13	559.	5.19	1.22	1.378E-02	238.63	43.100	6.286E-01	PB212
242.20	74.	27.40	1.22	1.364E-02	241.00	3.900	PBC<MDA	RA224
					241.92	7.470	4.845E-01	PB214
252.83	54.	39.31	0.70	1.317E-02				
252.83	54.	39.31	0.70	1.317E-02	256.25	6.800	4.051E-01	TH227
270.50	71.	33.80	1.66	1.242E-02				
295.40	119.	17.69	1.46	1.146E-02	295.22	19.200	3.624E-01	PB214
339.12	125.	17.53	1.26	1.004E-02	338.40	12.010	6.940E-01	AC228
352.55	237.	11.11	1.01	9.664E-03	351.99	37.100	4.406E-01	PB214
462.86	74.	25.17	1.38	7.375E-03				
462.86	74.	25.17	1.38	7.375E-03	463.51	10.000	6.598E-01	SB125
511.62	67.	21.77	2.02	6.683E-03	510.72	22.500	2.992E-01	TL208
584.32	180.	14.42	1.49	5.879E-03	583.14	86.000	2.377E-01	TL208
610.38	188.	12.18	1.69	5.640E-03	609.32	46.090	4.828E-01	BI214
728.56	33.	30.46	1.55	4.794E-03	727.17	11.800	3.849E-01	BI212
796.07	26.	36.22	1.60	4.420E-03	795.76	85.400	PBC<MDA	CS134
860.77	58.	24.50	1.04	4.122E-03				
912.73	84.	15.30	1.70	3.916E-03	911.07	29.000	4.954E-01	AC228
969.90	95.	15.86	1.72	3.715E-03	968.90	17.460	9.741E-01	AC228
1121.49	42.	29.11	0.88	3.280E-03	1120.28	15.040	5.660E-01	BI214
1463.17	553.	4.31	2.18	2.617E-03	1460.75	10.700	1.318E+01	K40

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
477.89	239.13	142.	559.	0.280	15.58	1.215	PB-212	D
484.04	242.21	168.	74.	0.037	82.21	1.217	PB-214	D
540.64	270.50	187.	71.	0.036	101.40	1.662	AC-228	s
1721.64	860.77	36.	58.	0.029	58.97	1.044	TL-208	s

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-212	148.91	74.67	932.	110.	0.055	117.66	1.500
PB-214	153.80	77.11	938.	194.	0.097	70.36	1.500D
PB-212	153.80	77.11	938.	194.	0.097	70.36	1.500D
RA-226	372.23	186.31	417.	80.	0.040	107.56	1.500s
PB-212	477.84	239.10	386.	494.	0.247	21.60	1.500
PB-214	591.08	295.71	188.	119.	0.059	56.34	1.500s
AC-228	677.91	339.12	138.	125.	0.063	52.59	1.261
PB-214	704.93	352.62	126.	208.	0.104	30.85	1.500
SB-125	927.52	463.88	93.	40.	0.020	108.17	1.500
TL-208	1023.02	511.62	62.	67.	0.034	65.30	2.023s
TL-208	1168.47	584.32	116.	180.	0.090	43.25	1.486
BI-214	1220.62	610.38	84.	188.	0.094	36.53	1.688s
BI-212	1457.08	728.56	33.	33.	0.016	91.39	1.554s
CS-134	1592.15	796.07	32.	26.	0.013	108.67	1.601s
AC-228	1825.61	912.73	29.	84.	0.042	45.90	1.697
AC-228	1940.01	969.90	38.	95.	0.047	47.59	1.725s
BI-214	2244.53	1122.07	24.	22.	0.011	112.82	1.819
K-40	2927.25	1463.17	24.	517.	0.259	13.79	2.042

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	MDA Value pCi/gm	COMMENTS
BE-7		4.3996E-03					
			477.56	4.400E-03	%(	3.883E-01 1.11E-01	G
K-40		1.2331E+01					
			1460.75	1.233E+01	(P	6.095E-01 5.67E-01	G
MN-54		-6.5902E-03					
			834.81	-6.590E-03	%(P	5.017E-02 1.42E-02	G
CO-57		-1.4838E-03					
			122.07	-1.484E-03	&(	5.330E-02 1.58E-02	G K
			136.43	6.561E-02	%	3.892E-01 1.16E-01	G
CO-60		9.7605E-03					
			1332.51	9.760E-03	%(P	4.475E-02 1.26E-02	G K
			1173.23	9.047E-03	%	7.435E-02 2.13E-02	G K
Sr-85		-1.3426E-02					
			514.00	-1.343E-02	%(	5.608E-02 1.66E-02	G
Kr-85		-3.0893E+02					
			513.99	-3.089E+02	%(	1.290E+03 3.82E+02	G
Y-88		-2.0600E-05					
			1836.01	-2.060E-05	%(P	2.313E-02 3.14E-03	G K
			898.02	-1.089E-03	% P	8.371E-02 2.38E-02	G
NB-94		2.3269E-02					
			871.10	2.327E-02	%(	4.026E-02 1.25E-02	G K
			702.50	-4.255E-03	%	4.569E-02 1.30E-02	G K
Ag-108M		1.4024E-02					
			722.95	1.402E-02	&(	4.472E-02 1.32E-02	G K
			614.37	-2.949E-02	& P	6.694E-02 2.02E-02	G
			433.93	8.304E-04	%	3.616E-02 1.02E-02	G
CD-109		-6.0113E-03					
			88.04	-6.011E-03	%(P	2.114E+00 6.30E-01	G
SN-113		8.3743E-05					
			391.71	8.374E-05	&(	5.970E-02 1.71E-02	G K
			255.04	-1.301E-01	%	1.826E+00 5.37E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	7.8710E-02						
		427.95	-1.741E-02	%(P	1.375E-01	3.97E-02	G K
		600.77	4.284E-02	& P	2.056E-01	5.94E-02	G
		636.15	8.103E-03	& P	3.826E-01	1.07E-01	G
		463.51	3.632E-01	(P	4.326E-01	1.36E-01	G
		176.29	-8.627E-03	& P	6.257E-01	1.84E-01	G
I-131	-7.9243E-03						
		364.48	-7.924E-03	&(	4.564E-02	1.34E-02	G K
		636.97	-8.144E-02	&	6.572E-01	1.89E-01	G
		284.29	-1.643E-01	%	6.613E-01	1.97E-01	G
CS-134	2.2867E-02						
		604.66	2.373E-03	%(	4.255E-02	1.20E-02	G K
		795.76	4.629E-02	@(	5.130E-02	1.68E-02	G
		569.29	-3.326E-02	&	2.653E-01	7.62E-02	G
		801.84	-1.144E-01	% P	6.058E-01	1.75E-01	G
CS-137	-6.7777E-03						
		661.62	-6.778E-03	&(	5.354E-02	1.53E-02	G
CE-139	-1.5151E-02						
		165.85	-1.515E-02	%(P	5.056E-02	1.52E-02	G
EU-152	5.7468E-02						
		121.78	5.747E-02	&(P	1.466E-01	4.43E-02	G K
		344.30	9.803E-04	%	1.447E-01	4.19E-02	G
		1408.08	-8.280E-03	&	2.557E-01	6.87E-02	G
		964.00	-2.825E-03	& P	4.160E-01	1.16E-01	G
		1112.07	9.869E-03	&	4.358E-01	1.21E-01	G
		778.90	-5.411E-02	% P	4.172E-01	1.20E-01	G
EU-154	-2.2901E-02						
		123.10	-2.290E-02	%(P	1.166E-01	3.49E-02	G K
		1274.80	-1.425E-02	%	1.760E-01	4.91E-02	G
		723.30	-6.602E-02	& P	2.894E-01	8.46E-02	G
		1004.80	2.079E-02	&	3.134E-01	8.77E-02	G
EU-155	-1.5571E-02						
		86.45	-1.557E-02	%(P	2.586E-01	7.70E-02	G K
		105.31	5.473E-02	%	2.352E-01	7.05E-02	G
HG-203	2.2207E-02						
		279.17	2.221E-02	%(P	4.621E-02	1.40E-02	G K
		72.87	-3.636E-01	%	2.027E+00	6.08E-01	G
		70.83	-5.970E-01	%	3.678E+00	1.10E+00	G
		82.50	-3.672E-01	&	3.831E+00	1.14E+00	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	2.5048E-01						
		583.14	2.377E-01	(P	6.980E-02	3.44E-02	G
		510.72	2.992E-01	*(	1.744E-01	6.52E-02	G
PB-212	5.5507E-01						
		238.63	5.551E-01	(	1.059E-01	4.00E-02	G K
							Energy duplication
		77.11	7.770E-01	+	5.825E-01	1.82E-01	G
		74.81	8.673E-01	& P	1.141E+00	3.50E-01	G
PB-214	3.7833E-01						
		351.99	3.878E-01	(P	1.026E-01	4.00E-02	G K
		295.22	3.600E-01	*(	2.025E-01	6.76E-02	G
							Energy duplication
		77.11	1.271E+00	+	9.527E-01	2.98E-01	G
		241.92	2.405E-01	%	6.810E-01	2.05E-01	G
BI-212	3.8485E-01						
		727.17	3.849E-01	&(	3.480E-01	1.17E-01	G K
		1620.56	-3.404E-02	& P	7.476E-01	1.01E-01	G
		785.42	-2.659E-03	% P	2.670E+00	7.48E-01	G
BI-214	4.8279E-01						
		609.32	4.828E-01	@(	1.166E-01	5.89E-02	G K
		1764.51	-7.281E-02	& P	4.538E-01	1.27E-01	G
		1120.28	3.017E-01	-	3.456E-01	1.13E-01	G
RA-224	5.4845E-01						
		241.00	5.485E-01	&(P	1.246E+00	3.77E-01	G
RA-226	9.9839E-01						
		185.99	9.984E-01	@(P	1.227E+00	3.78E-01	G
AC-228	5.5359E-01						
		911.07	4.954E-01	(P	1.628E-01	7.61E-02	G K
		968.90	9.741E-01	+ P	3.255E-01	1.55E-01	G
		338.40	6.940E-01	(	3.175E-01	1.22E-01	G
TH-227	1.2467E-02						
		236.00	1.247E-02	%(P	5.422E-01	1.61E-01	G K
		256.25	-4.181E-02	%	4.179E-01	1.22E-01	G
PA-234	-4.0150E-02						
		98.44	-4.015E-02	%(	2.377E-01	7.11E-02	G K
		946.00	2.948E-02	&	2.562E-01	7.23E-02	G
		131.28	7.556E-02	&	2.027E-01	6.11E-02	G
		94.67	-7.229E-02	%	4.359E-01	1.31E-01	G
		883.24	-5.223E-02	%	4.254E-01	1.21E-01	G
		926.70	7.958E-02	%	4.575E-01	1.31E-01	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26-4.913E-02 &   3.934E-01 1.13E-01 G

TH-234       1.9259E-01
                           63.29 1.926E-01 %(P 4.707E+00 1.40E+00 G K
                           92.80 1.160E+00 %   2.283E+00 6.93E-01 G
                           92.38 1.300E+00 % P 2.732E+00 8.28E-01 G

AM-241       9.4394E-02
                           59.54 9.439E-02 %(  6.048E-01 1.81E-01 G
   ( - This peak used in the nuclide activity average.

   * - Peak is too wide, but only one peak in library.
   ! - Peak is part of a multiplet and this area went
       negative during deconvolution.
   ? - Peak is too narrow.
   @ - Peak is too wide at FW25M, but ok at FWHM.
   % - Peak fails sensitivity test.
   $ - Peak identified, but first peak of this nuclide
       failed one or more qualification tests.
   + - Peak activity higher than counting uncertainty range.
   - - Peak activity lower than counting uncertainty range.
   = - Peak outside analysis energy range.
   & - Calculated peak centroid is not close enough to the
       library energy centroid for positive identification.
   P - Peakbackground subtraction
   } - Peak is too close to another for the activity
       to be found directly.

   Nuclide Codes:                      Peak Codes:
   T - Thermal Neutron Activation      G - Gamma Ray
   F - Fast Neutron Activation         X - X-Ray
   I - Fission Product                 P - Positron Decay
   N - Naturally Occurring Isotope     S - Single-Escape
   P - Photon Reaction                 D - Double-Escape
   C - Charged Particle Reaction       K - Key Line
   M - No MDA Calculation              A - Not in Average
   R - Coincidence Corrected           C - Coincidence Peak
   H - Halflife limit exceeded

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
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***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	4.3819E-03	4.3996E-03	3.3154E-01	3.3154E-01	3.867E-01
K-40		1.2331E+01	1.2331E+01	1.7005E+00	1.8359E+00	6.095E-01
MN-54	#A	-6.5857E-03	-6.5902E-03	4.7322E-02	4.7324E-02	5.014E-02
CO-57	#B	-1.4826E-03	-1.4838E-03	4.7448E-02	4.7448E-02	5.326E-02
CO-60	#B	9.7594E-03	9.7605E-03	3.7722E-02	3.7726E-02	4.475E-02

Sr-85	#A	-1.3382E-02	-1.3426E-02	4.9795E-02	4.9801E-02	5.589E-02
Kr-85	#A	-3.0893E+02	-3.0893E+02	1.1457E+03	1.1459E+03	1.290E+03
Y-88	#B	-2.0558E-05	-2.0600E-05	1.2360E-04	1.2360E-04	2.309E-02
NB-94	#B	2.3269E-02	2.3269E-02	3.7502E-02	3.7525E-02	4.026E-02
Ag-108M	#B	1.4024E-02	1.4024E-02	3.9463E-02	3.9471E-02	4.472E-02
CD-109	#A	-6.0085E-03	-6.0113E-03	3.3807E+00	3.3807E+00	2.113E+00
SN-113	#B	8.3587E-05	8.3743E-05	5.1406E-02	5.1406E-02	5.959E-02
SB-125	#B	7.8693E-02	7.8710E-02	8.8431E-02	8.8541E-02	1.375E-01
I-131	#B	-7.7154E-03	-7.9243E-03	4.0133E-02	4.0136E-02	4.444E-02
CS-134	#B	2.2861E-02	2.2867E-02	2.4849E-02	2.4883E-02	4.254E-02
CS-137	#A	-6.7775E-03	-6.7777E-03	4.6026E-02	4.6028E-02	5.354E-02
CE-139	#A	-1.5127E-02	-1.5151E-02	4.6842E-02	4.6849E-02	5.048E-02
EU-152	#B	5.7466E-02	5.7468E-02	1.3275E-01	1.3279E-01	1.466E-01
EU-154	#B	-2.2899E-02	-2.2901E-02	1.0657E-01	1.0658E-01	1.166E-01
EU-155	#B	-1.5569E-02	-1.5571E-02	5.6247E-01	5.6247E-01	2.585E-01
HG-203	#B	2.2105E-02	2.2207E-02	4.2036E-02	4.2055E-02	4.600E-02
TL-208		2.5048E-01	2.5048E-01	9.8160E-02	9.9162E-02	
PB-212	#	5.5507E-01	5.5507E-01	1.1991E-01	1.2389E-01	1.059E-01
PB-214	#	3.7833E-01	3.7833E-01	1.1694E-01	1.1885E-01	1.026E-01
BI-212	#	3.8485E-01	3.8485E-01	3.5173E-01	3.5239E-01	3.480E-01
BI-214	#	4.8279E-01	4.8279E-01	1.7636E-01	1.7842E-01	
RA-224	#A	5.4845E-01	5.4845E-01	1.1305E+00	1.1309E+00	1.246E+00
RA-226	#A	9.9839E-01	9.9839E-01	1.1340E+00	1.1354E+00	1.227E+00
AC-228		5.5359E-01	5.5359E-01	1.9343E-01	1.9591E-01	
TH-227	#B	1.2467E-02	1.2467E-02	4.8347E-01	4.8347E-01	5.422E-01
PA-234	#B	-4.0150E-02	-4.0150E-02	2.1337E-01	2.1338E-01	2.377E-01
TH-234	#B	1.9259E-01	1.9259E-01	4.2055E+00	4.2055E+00	4.707E+00
AM-241	#A	9.4394E-02	9.4394E-02	5.4174E-01	5.4176E-01	6.048E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (1121.3 to 1999.0 keV) 1.4002648E+01 pCi/gm
Total Decayed Activity (1121.3 to 1999.0 keV) 1.4002648E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
DAT

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 102F_24JUL2006_1807.An1

Sample description
FSS-OOL-05-05-014-F-S

Spectrum Filename: C:\GammaVision\Spectra\102F_24JUL2006_1807.An1

Acquisition information
Start time: 24-Jul-2006 18:07:33
Live time: 2000
Real time: 2018
Dead time: 0.91 %
Detector ID: 3

Detector system
Det 102 - DSPP-468

Calibration
Filename: D2_1LSa.Clb
DET 102 1 Liter Sand Geometry

Energy Calibration
Created: 15-Jan-2005 03:09:29
Zero offset: 0.220 keV
Gain: 0.500 keV/channel
Quadratic: -6.435E-08 keV/channel^2

Efficiency Calibration
Created: 15-Jan-2005 06:48:10
Type: Polynomial
Uncertainty: 0.497 %
Coefficients: -0.294180 -5.980622 0.744607
-0.096737 0.005214 -0.000120

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.22keV)
Stop channel: 4000 (1999.02keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 2.1760E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 2.1760E+03) =
4.5956E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	24-Jul-2006 08:05:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	102_150K_28APR05.Pbc 01-May-2005 05:27:47
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 11 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.5838

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
76.47	253.	16.18	1.26	9.352E-03				
76.47	253.	16.18	1.26	9.352E-03	77.11	10.700	1.538E+00	PB214
					77.11	17.500	9.403E-01	PB212
86.88	140.	32.31	1.09	1.209E-02				
86.88	140.	32.31	1.09	1.209E-02	88.04	3.790	1.845E+00	CD109
98.35	55.	37.71	1.24	1.431E-02				
98.35	55.	37.71	1.24	1.431E-02	98.44	25.100	9.423E-02	PA234
131.02	106.	29.22	1.00	1.721E-02				
186.38	100.	31.40	1.23	1.625E-02	185.99	3.280	1.118E+00	RA226
209.38	74.	38.76	1.50	1.519E-02				
239.07	465.	5.81	1.22	1.379E-02	238.63	43.100	4.853E-01	PB212
242.31	71.	26.42	1.22	1.364E-02	241.00	3.900	PBC<MDA	RA224
					241.92	7.470	4.330E-01	PB214
295.68	102.	15.78	1.25	1.145E-02	295.22	19.200	2.885E-01	PB214
300.91	41.	34.69	1.26	1.126E-02				
338.90	109.	22.47	1.10	1.005E-02	338.40	12.010	5.623E-01	AC228
352.52	222.	11.76	1.35	9.664E-03	351.99	37.100	3.826E-01	PB214
511.70	72.	22.74	1.95	6.682E-03	510.72	22.500	2.948E-01	TL208
					513.99	0.004	1.552E+03	Kr85
					514.00	99.270	6.753E-02	Sr85
584.22	165.	12.18	1.56	5.880E-03	583.14	86.000	2.020E-01	TL208
610.21	166.	10.18	1.71	5.641E-03	609.32	46.090	3.955E-01	BI214
728.07	54.	21.52	0.76	4.794E-03	727.17	11.800	5.972E-01	BI212
912.86	106.	13.18	1.68	3.915E-03				
970.08	81.	20.53	1.46	3.714E-03	968.90	17.460	7.727E-01	AC228
1121.28	53.	24.84	2.43	3.283E-03	1120.28	15.040	6.691E-01	BI214
1463.25	500.	4.53	2.08	2.617E-03	1460.75	10.700	1.107E+01	K40

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
173.34	86.88	738.	140.	0.070	96.94	1.085	BI-207	l
261.63	131.02	354.	106.	0.053	87.67	0.999	PA-234	l
418.39	209.38	288.	74.	0.037	116.29	1.500	AC-228	sM
477.76	238.94	132.	465.	0.232	17.42	1.215	PB-212	D
484.24	242.18	141.	71.	0.036	79.26	1.217	PB-214	D
601.48	300.91	127.	59.	0.029	102.92	0.882	PB-212	M
1825.86	912.86	23.	113.	0.057	33.36	1.676	AC-228	M
1940.36	970.08	42.	83.	0.041	46.96	1.462	AC-228	M

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.
M - Peak is close to a library peak.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-214	153.80	77.11	764.	150.	0.075	81.81	1.500D
PB-212	153.80	77.11	764.	150.	0.075	81.81	1.500D
RA-226	372.21	186.30	361.	73.	0.037	108.46	1.500
PB-212	477.61	238.99	304.	428.	0.214	22.56	1.500
PB-214	591.04	295.69	140.	108.	0.054	54.58	1.500
AC-228	677.70	339.01	147.	90.	0.045	65.60	1.500
PB-214	704.92	352.62	120.	175.	0.088	34.74	1.500s
TL-208	1023.18	511.70	66.	72.	0.036	68.22	1.951s
TL-208	1168.27	584.22	65.	165.	0.082	36.54	1.559
BI-214	1220.28	610.21	44.	166.	0.083	30.55	1.709
BI-212	1456.10	728.07	31.	54.	0.027	64.55	0.759s
BI-214	2242.95	1121.28	37.	53.	0.027	74.52	2.427s
K-40	2927.44	1463.26	1.	490.	0.245	13.58	2.042

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	MDA Value pCi/gm	COMMENTS
BE-7		-2.6141E-02					
			477.56	-2.614E-02	&(	3.332E-01 9.53E-02	G
K-40		1.0847E+01					
			1460.75	1.085E+01	(P	1.638E-01 4.91E-01	G
MN-54		7.2784E-04					
			834.81	7.278E-04	&(P	4.282E-02 1.18E-02	G
CO-57		-2.6202E-03					
			122.07	-2.620E-03	&(	4.818E-02 1.43E-02	G K
			136.43	-1.031E-01	&	3.252E-01 9.77E-02	G
CO-60		4.3835E-03					
			1332.51	4.384E-03	%(P	4.752E-02 1.30E-02	G K
			1173.23	0.000E+00	%	6.484E-02 1.81E-02	G K
Sr-85		-1.7658E-02					
			514.00	-1.766E-02	%(	4.657E-02 1.40E-02	G
Kr-85		-4.0583E+02					
			513.99	-4.058E+02	%(	1.070E+03 3.21E+02	G
Y-88		-7.3219E-03					
			1836.01	-7.322E-03	%(P	4.953E-02 1.34E-02	G K
			898.02	4.914E-03	% P	5.268E-02 1.48E-02	G
NB-94		6.7145E-05					
			871.10	6.715E-05	&(	3.601E-02 9.68E-03	G K
			702.50	-9.470E-03	&	4.373E-02 1.27E-02	G K
Ag-108M		-1.2327E-02					
			722.95	-1.233E-02	&(	4.922E-02 1.44E-02	G K
			614.37	-4.280E-02	& P	6.396E-02 1.98E-02	G
			433.93	-1.284E-03	%	3.107E-02 8.77E-03	G
CD-109		1.0797E+00					
			88.04	1.080E+00	%(P	1.787E+00 5.45E-01	G
SN-113		-1.1151E-03					
			391.71	-1.115E-03	%(	4.073E-02 1.15E-02	G K
			255.04	-8.504E-02	%	1.723E+00 5.06E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	-8.2373E-03						
		427.95	-8.237E-03	&(P	1.202E-01	3.43E-02	G K
		600.77	-1.482E-03	% P	1.884E-01	5.23E-02	G
		636.15	-6.991E-02	% P	3.731E-01	1.08E-01	G
		463.51	1.643E-01	% P	3.656E-01	1.10E-01	G
		176.29	7.418E-02	% P	5.542E-01	1.64E-01	G
I-131	-3.4994E-04						
		364.48	-3.499E-04	%(	3.357E-02	9.51E-03	G K
		636.97	-8.715E-02	%	5.913E-01	1.70E-01	G
		284.29	3.707E-02	%	5.859E-01	1.71E-01	G
CS-134	-2.0072E-03						
		604.66	-2.007E-03	%(	3.584E-02	1.01E-02	G K
		795.76	1.422E-02	%	4.881E-02	1.43E-02	G
		569.29	3.522E-03	%	2.279E-01	6.38E-02	G
		801.84	7.938E-02	% P	4.301E-01	1.22E-01	G
CS-137	1.8369E-02						
		661.62	1.837E-02	%(	3.870E-02	1.17E-02	G
CE-139	-7.0935E-03						
		165.85	-7.094E-03	%(P	4.696E-02	1.40E-02	G
EU-152	-5.1149E-04						
		121.78	-5.115E-04	&(P	1.309E-01	3.87E-02	G K
		344.30	-4.871E-02	%	1.443E-01	4.32E-02	G
		1408.08	4.799E-02	%	2.224E-01	6.29E-02	G
		964.00	5.623E-02	& P	3.408E-01	9.73E-02	G
		1112.07	-7.525E-02	%	4.524E-01	1.30E-01	G
		778.90	4.237E-02	% P	2.952E-01	8.35E-02	G
EU-154	4.0747E-02						
		123.10	4.075E-02	%(P	7.451E-02	2.27E-02	G K
		1274.80	-3.160E-02	%	1.821E-01	5.22E-02	G
		723.30	-1.468E-03	% P	3.300E-01	9.47E-02	G
		1004.80	-5.191E-02	&	2.983E-01	8.55E-02	G
EU-155	1.6789E-02						
		86.45	1.679E-02	%(P	1.574E-01	4.66E-02	G K
		105.31	1.569E-02	&	2.031E-01	6.04E-02	G
HG-203	-7.3502E-04						
		279.17	-7.350E-04	&(P	3.910E-02	1.14E-02	G K
		72.87	-4.423E-01	&	1.777E+00	5.35E-01	G
		70.83	3.442E-02	%	3.125E+00	9.29E-01	G
		82.50	-1.109E-01	%	2.748E+00	8.15E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	2.0204E-01						
		583.14	2.020E-01	(P	4.946E-02	2.47E-02	G
		510.72	2.948E-01	+	1.678E-01	6.71E-02	G
PB-212	4.4661E-01						
		238.63	4.466E-01	(	8.760E-02	3.36E-02	G K
							Energy duplication
		77.11	5.586E-01	+	4.890E-01	1.52E-01	G
		74.81	4.856E-01	& P	1.040E+00	3.15E-01	G
PB-214	3.0399E-01						
		351.99	3.034E-01	@(P	9.288E-02	3.52E-02	G K
		295.22	3.051E-01	(	1.630E-01	5.55E-02	G
							Energy duplication
		77.11	9.136E-01	+	7.998E-01	2.49E-01	G
		241.92	3.297E-01	%	5.691E-01	1.74E-01	G
BI-212	5.9720E-01						
		727.17	5.972E-01	(	3.127E-01	1.29E-01	G K
		1620.56	-2.615E-01	% P	1.838E+00	4.96E-01	G
		785.42	-9.970E-02	% P	2.303E+00	6.47E-01	G
BI-214	3.9545E-01						
		609.32	3.955E-01	(	8.036E-02	4.03E-02	G K
		1764.51	-4.380E-02	% P	3.321E-01	9.03E-02	G
		1120.28	6.691E-01	+	3.896E-01	1.66E-01	G
RA-224	1.3988E-01						
		241.00	1.399E-01	&(P	1.108E+00	3.29E-01	G
RA-226	8.5347E-01						
		185.99	8.535E-01	(P	1.062E+00	3.27E-01	G
AC-228	1.0034E-01						
		911.07	-4.862E-02	%(P	1.885E-01	5.50E-02	G K
		968.90	-1.799E-02	% P	3.348E-01	9.46E-02	G
		338.40	4.601E-01	(	3.041E-01	1.01E-01	G
TH-227	-2.0214E-01						
		236.00	-2.021E-01	%(P	4.126E-01	1.25E-01	G K
		256.25	3.182E-03	&	4.562E-01	1.33E-01	G
PA-234	-7.5604E-02						
		98.44	-7.560E-02	%(	2.090E-01	6.31E-02	G K
		946.00	-3.360E-02	%	2.659E-01	7.58E-02	G
		131.28	7.710E-02	%	1.928E-01	5.82E-02	G
		94.67	2.162E-02	%	3.917E-01	1.17E-01	G
		883.24	-3.423E-02	&	4.209E-01	1.19E-01	G
		926.70	1.223E-01	%	3.786E-01	1.11E-01	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26 7.017E-03 %   3.277E-01 9.17E-02 G

TH-234       6.9502E-01
                           63.29 6.950E-01 %(P 3.891E+00 1.16E+00 G K
                           92.80 1.273E+00 %   2.107E+00 6.42E-01 G
                           92.38-5.760E-01 % P 2.175E+00 6.52E-01 G

AM-241      -1.0811E-01
                           59.54-1.081E-01 &(  5.803E-01 1.74E-01 G
   ( - This peak used in the nuclide activity average.

   * - Peak is too wide, but only one peak in library.
   ! - Peak is part of a multiplet and this area went
       negative during deconvolution.
   ? - Peak is too narrow.
   @ - Peak is too wide at FW25M, but ok at FWHM.
   % - Peak fails sensitivity test.
   $ - Peak identified, but first peak of this nuclide
       failed one or more qualification tests.
   + - Peak activity higher than counting uncertainty range.
   - - Peak activity lower than counting uncertainty range.
   = - Peak outside analysis energy range.
   & - Calculated peak centroid is not close enough to the
       library energy centroid for positive identification.
   P - Peakbackground subtraction
   } - Peak is too close to another for the activity
       to be found directly.

   Nuclide Codes:                      Peak Codes:
   T - Thermal Neutron Activation      G - Gamma Ray
   F - Fast Neutron Activation         X - X-Ray
   I - Fission Product                 P - Positron Decay
   N - Naturally Occurring Isotope     S - Single-Escape
   P - Photon Reaction                 D - Double-Escape
   C - Charged Particle Reaction       K - Key Line
   M - No MDA Calculation              A - Not in Average
   R - Coincidence Corrected           C - Coincidence Peak
   H - Halflife limit exceeded

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
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***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	-2.6000E-02	-2.6141E-02	2.8598E-01	2.8598E-01	3.314E-01
K-40		1.0847E+01	1.0847E+01	1.4732E+00	1.5940E+00	1.638E-01
MN-54	#A	7.2717E-04	7.2784E-04	3.5443E-02	3.5443E-02	4.278E-02
CO-57	#B	-2.6174E-03	-2.6202E-03	4.2915E-02	4.2915E-02	4.812E-02
CO-60	#B	4.3829E-03	4.3835E-03	3.8937E-02	3.8938E-02	4.751E-02

Sr-85	#A	-1.7579E-02	-1.7658E-02	4.1898E-02	4.1909E-02	4.636E-02
Kr-85	#A	-4.0583E+02	-4.0583E+02	9.6292E+02	9.6319E+02	1.070E+03
Y-88	#B	-7.3020E-03	-7.3219E-03	4.0549E-02	4.0551E-02	4.940E-02
NB-94	#B	6.7145E-05	6.7145E-05	2.9047E-02	2.9047E-02	3.601E-02
Ag-108M	#B	-1.2327E-02	-1.2327E-02	4.3169E-02	4.3174E-02	4.922E-02
CD-109	#A	1.0790E+00	1.0797E+00	1.6339E+00	1.6350E+00	1.786E+00
SN-113	#B	-1.1123E-03	-1.1151E-03	3.4499E-02	3.4499E-02	4.063E-02
SB-125	#B	-8.2350E-03	-8.2373E-03	1.9975E-01	1.9975E-01	1.202E-01
I-131	#B	-3.3755E-04	-3.4994E-04	2.8518E-02	2.8518E-02	3.238E-02
CS-134	#B	-2.0064E-03	-2.0072E-03	3.0208E-02	3.0208E-02	3.583E-02
CS-137	#A	1.8368E-02	1.8369E-02	3.5235E-02	3.5250E-02	3.870E-02
CE-139	#A	-7.0786E-03	-7.0935E-03	4.4373E-02	4.4375E-02	4.686E-02
EU-152	#B	-5.1146E-04	-5.1149E-04	3.1490E-01	3.1490E-01	1.309E-01
EU-154	#B	4.0743E-02	4.0747E-02	6.8072E-02	6.8110E-02	7.450E-02
EU-155	#B	1.6786E-02	1.6789E-02	1.3995E-01	1.3995E-01	1.574E-01
HG-203	#B	-7.3046E-04	-7.3502E-04	4.0006E-02	4.0006E-02	3.885E-02
TL-208		2.0204E-01	2.0204E-01	7.4016E-02	7.4879E-02	
PB-212	#	4.4661E-01	4.4661E-01	1.0076E-01	1.0383E-01	8.760E-02
PB-214	#	3.0399E-01	3.0399E-01	9.8409E-02	9.9877E-02	9.288E-02
BI-212		5.9720E-01	5.9720E-01	3.8551E-01	3.8697E-01	
BI-214		3.9545E-01	3.9545E-01	1.2083E-01	1.2285E-01	
RA-224	#A	1.3988E-01	1.3988E-01	9.8700E-01	9.8704E-01	1.108E+00
RA-226	#A	8.5347E-01	8.5347E-01	9.8195E-01	9.8312E-01	1.062E+00
AC-228	B	1.0034E-01	1.0034E-01	6.5822E-02	6.6062E-02	1.885E-01
TH-227	#B	-2.0214E-01	-2.0214E-01	3.7969E-01	3.7985E-01	4.126E-01
PA-234	#B	-7.5604E-02	-7.5604E-02	1.8916E-01	1.8920E-01	2.090E-01
TH-234	#B	6.9502E-01	6.9502E-01	3.4910E+00	3.4912E+00	3.891E+00
AM-241	#A	-1.0811E-01	-1.0811E-01	5.2077E-01	5.2080E-01	5.803E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (295.7 to 1999.0 keV) 1.2142522E+01 pCi/gm
Total Decayed Activity (295.7 to 1999.0 keV) 1.2142522E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
DAT

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 102F_25JUL2006_1650.An1

Sample description
FSS-OOL-05-05--023-F-B WET

Spectrum Filename: C:\GammaVision\Spectra\102F_25JUL2006_1650.An1

Acquisition information
Start time: 25-Jul-2006 16:50:44
Live time: 2000
Real time: 2014
Dead time: 0.71 %
Detector ID: 3

Detector system
Det 102 - DSPP-468

Calibration
Filename: D2_1LSa.Clb
DET 102 1 Liter Sand Geometry

Energy Calibration
Created: 15-Jan-2005 03:09:29
Zero offset: 0.220 keV
Gain: 0.500 keV/channel
Quadratic: -6.435E-08 keV/channel^2

Efficiency Calibration
Created: 15-Jan-2005 06:48:10
Type: Polynomial
Uncertainty: 0.497 %
Coefficients: -0.294180 -5.980622 0.744607
-0.096737 0.005214 -0.000120

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.22keV)
Stop channel: 4000 (1999.02keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 1.9430E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.9430E+03) =
5.1467E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	25-Jul-2006 13:45:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	102_150K_28APR05.Pbc 01-May-2005 05:27:47
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 11 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.7339

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
76.38	200.	19.06	1.84	9.326E-03	74.81	9.600	1.613E+00	PB212
					77.11	10.700	1.363E+00	PB214
					77.11	17.500	8.331E-01	PB212
239.07	290.	7.78	1.22	1.379E-02	236.00	11.200	1.290E+00	TH227
					238.63	43.100	3.386E-01	PB212
242.70	61.	26.10	1.22	1.362E-02	241.00	3.900	PBC<MDA	RA224
					241.92	7.470	4.185E-01	PB214
295.78	107.	17.41	1.19	1.145E-02	295.22	19.200	3.381E-01	PB214
338.95	54.	25.55	1.85	1.004E-02	338.40	12.010	3.120E-01	AC228
352.62	161.	12.96	1.42	9.662E-03	351.99	37.100	3.107E-01	PB214
463.90	26.	36.17	1.50	7.365E-03	463.51	10.000	PBC<MDA	SB125
478.27	30.	35.23	1.50	7.151E-03	477.56	10.300	PBC<MDA	BE7
511.61	77.	22.80	1.02	6.683E-03	510.72	22.500	3.574E-01	TL208
584.32	105.	16.45	1.42	5.879E-03	583.14	86.000	1.431E-01	TL208
610.53	103.	12.91	1.15	5.639E-03	609.32	46.090	2.746E-01	BI214
769.90	34.	35.80	1.04	4.552E-03				
912.87	72.	17.87	0.98	3.915E-03	911.07	29.000	4.389E-01	AC228
970.16	54.	19.07	1.35	3.714E-03	968.90	17.460	5.739E-01	AC228
1122.01	31.	30.45	1.69	3.283E-03	1120.28	15.040	4.381E-01	BI214
1463.29	401.	4.99	1.99	2.617E-03	1460.75	10.700	9.942E+00	K40

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
477.77	238.96	109.	290.	0.145	23.35	1.215	PB-212	D

Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM	Suspected	
485.03	242.59	98.	61.	0.031	78.30	1.218	XE-138	D
1539.80	769.90	35.	34.	0.017	90.40	1.040	BI-214	sM
1940.52	970.16	9.	57.	0.028	45.97	1.349	AC-228	M

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.
M - Peak is close to a library peak.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-214	153.80	77.11	610.	124.	0.062	88.81	1.500D
PB-212	153.80	77.11	610.	124.	0.062	88.81	1.500D
TH-227	477.88	239.12	173.	278.	0.139	26.92	1.500s
PB-212	477.78	239.07	271.	261.	0.130	32.58	1.500
PB-214	591.21	295.78	109.	98.	0.049	54.44	1.500s
AC-228	677.45	338.89	87.	49.	0.024	91.67	1.500
PB-214	704.88	352.60	69.	144.	0.072	34.88	1.500
SB-125	927.54	463.90	37.	26.	0.013	108.50	1.500s
BE-7	956.30	478.27	40.	30.	0.015	105.69	1.500s
TL-208	1023.01	511.61	62.	77.	0.039	68.41	1.022s
TL-208	1168.47	584.32	51.	104.	0.052	49.35	1.418s
BI-214	1220.92	610.53	27.	103.	0.051	38.74	1.155
AC-228	1825.78	912.82	17.	57.	0.028	50.17	1.679
BI-214	2244.42	1122.01	19.	31.	0.016	91.36	1.693
K-40	2927.60	1463.34	18.	369.	0.185	16.33	2.042

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Code	MDA Value pCi/gm	COMMENTS
BE-7		2.8212E-01					
			477.56	2.821E-01	*(	3.054E-01	9.94E-02 G
K-40		9.1635E+00					
			1460.75	9.164E+00	(P	5.548E-01	4.99E-01 G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
MN-54	9.2625E-03						
		834.81	9.263E-03	&(P	3.775E-02	1.08E-02	G
CO-57	6.7403E-03						
		122.07	6.740E-03	&(	4.403E-02	1.31E-02	G K
		136.43	4.575E-02	%	3.611E-01	1.07E-01	G
CO-60	-4.9145E-03						
		1332.51	-4.915E-03	%(P	5.123E-02	1.39E-02	G K
		1173.23	2.389E-02	%	5.843E-02	1.75E-02	G K
Sr-85	-2.6652E-03						
		514.00	-2.665E-03	&(	3.852E-02	1.10E-02	G
Kr-85	-6.1156E+01						
		513.99	-6.116E+01	&(	8.880E+02	2.52E+02	G
Y-88	-2.1402E-05						
		1836.01	-2.140E-05	%(P	5.488E-02	1.40E-02	G K
		898.02	-2.576E-03	& P	4.918E-02	1.33E-02	G
NB-94	-2.9937E-03						
		871.10	-2.994E-03	%(	3.117E-02	8.37E-03	G K
		702.50	1.234E-02	%	3.812E-02	1.12E-02	G K
Ag-108M	-3.7178E-05						
		722.95	-3.718E-05	&(	4.715E-02	1.30E-02	G K
		614.37	1.312E-03	% P	4.973E-02	1.40E-02	G
		433.93	-4.069E-03	%	3.825E-02	1.10E-02	G
CD-109	1.9926E-01						
		88.04	1.993E-01	%(P	1.710E+00	5.09E-01	G
SN-113	8.3655E-04						
		391.71	8.365E-04	&(	4.861E-02	1.38E-02	G K
		255.04	-1.082E-01	%	1.554E+00	4.53E-01	G
SB-125	8.5523E-02						
		427.95	3.137E-02	&(P	9.207E-02	2.71E-02	G K
		600.77	8.799E-03	% P	1.789E-01	4.94E-02	G
		636.15	-3.835E-02	& P	2.844E-01	7.95E-02	G
		463.51	2.458E-01	*(P	2.950E-01	9.42E-02	G
		176.29	1.484E-02	& P	5.538E-01	1.63E-01	G
I-131	0.0000E+00						
		364.48	0.000E+00	&(	4.543E-02	1.30E-02	G K
		636.97	3.681E-02	%	4.852E-01	1.35E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
		284.29	1.094E-02	%	4.195E-01	1.20E-01	G
CS-134	6.6989E-03						
		604.66	6.699E-03	&(	3.431E-02	9.82E-03	G K
		795.76	1.288E-02	%	4.483E-02	1.30E-02	G
		569.29	0.000E+00	%	2.574E-01	7.20E-02	G
		801.84	-9.212E-04	& P	5.710E-01	1.58E-01	G
CS-137	1.7626E-02						
		661.62	1.763E-02	%(	5.037E-02	1.50E-02	G
CE-139	-8.3482E-03						
		165.85	-8.348E-03	%(P	4.418E-02	1.31E-02	G
EU-152	1.5573E-02						
		121.78	1.557E-02	&(P	1.334E-01	3.96E-02	G K
		344.30	-1.306E-02	&	1.225E-01	3.55E-02	G
		1408.08	-5.040E-02	%	2.876E-01	8.12E-02	G
		964.00	-5.490E-02	% P	3.289E-01	9.25E-02	G
		1112.07	6.533E-02	%	3.487E-01	9.84E-02	G
		778.90	-3.723E-02	% P	3.484E-01	9.81E-02	G
EU-154	1.9657E-02						
		123.10	1.966E-02	&(P	9.636E-02	2.88E-02	G K
		1274.80	-9.492E-03	&	1.661E-01	4.56E-02	G
		723.30	-9.106E-03	& P	2.246E-01	6.24E-02	G
		1004.80	6.661E-02	&	2.854E-01	8.22E-02	G
EU-155	-2.6975E-03						
		86.45	-2.698E-03	%(P	1.955E-01	5.77E-02	G K
		105.31	1.374E-02	&	2.171E-01	6.44E-02	G
HG-203	7.1613E-03						
		279.17	7.161E-03	&(P	3.447E-02	1.01E-02	G K
		72.87	-4.242E-01	%	1.768E+00	5.31E-01	G
		70.83	-3.505E-02	&	3.171E+00	9.41E-01	G
		82.50	1.027E+00	%	3.433E+00	1.03E+00	G
TL-208	1.4306E-01						
		583.14	1.431E-01	*(P	4.933E-02	2.37E-02	G
		510.72	3.574E-01	+	1.814E-01	8.16E-02	G
PB-212	3.0501E-01						
		238.63	3.050E-01	(	9.285E-02	3.31E-02	G K Energy duplication
		77.11	5.157E-01	+	4.905E-01	1.53E-01	G
		74.81	4.536E-01	& P	1.018E+00	3.08E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
PB-214	2.8931E-01						
		351.99	2.788E-01	(P	8.024E-02	3.25E-02	G K
		295.22	3.096E-01	(	1.624E-01	5.62E-02	G
							Energy duplication
		77.11	8.434E-01	+	8.023E-01	2.50E-01	G
		241.92	3.629E-02	&	5.288E-01	1.56E-01	G
BI-212	0.0000E+00						
		727.17	0.000E+00	%(	3.575E-01	9.84E-02	G K
		1620.56	-3.540E-02	% P	7.776E-01	1.06E-01	G
		785.42	5.104E-01	& P	1.990E+00	5.75E-01	G
BI-214	2.7459E-01						
		609.32	2.746E-01	(	7.216E-02	3.55E-02	G K
		1764.51	-3.707E-02	& P	4.384E-01	1.20E-01	G
		1120.28	4.381E-01	+	3.235E-01	1.34E-01	G
RA-224	-6.7912E-04						
		241.00	-6.791E-04	&(P	1.080E+00	3.17E-01	G
RA-226	6.6869E-01						
		185.99	6.687E-01	%(P	1.036E+00	3.16E-01	G
AC-228	3.2835E-01						
		911.07	3.480E-01	(P	1.352E-01	5.84E-02	G K
		968.90	-3.305E-02	% P	3.228E-01	9.10E-02	G
		338.40	2.808E-01	(	2.654E-01	8.58E-02	G
TH-227	1.2399E+00						
		236.00	1.240E+00	&(P	2.855E-01	1.11E-01	G K
		256.25	8.846E-02	%	4.673E-01	1.38E-01	G
PA-234	-2.3456E-02						
		98.44	-2.346E-02	%(	2.113E-01	6.29E-02	G K
		946.00	4.152E-03	%	2.003E-01	5.36E-02	G
		131.28	-3.696E-02	%	2.019E-01	6.02E-02	G
		94.67	-4.387E-02	&	3.841E-01	1.14E-01	G
		883.24	-1.371E-02	%	3.509E-01	9.57E-02	G
		926.70	-6.119E-02	%	4.010E-01	1.13E-01	G
		569.26	0.000E+00	%	3.818E-01	1.07E-01	G
TH-234	1.2070E+00						
		63.29	1.207E+00	%(P	3.674E+00	1.10E+00	G K
		92.80	7.887E-01	%	2.032E+00	6.14E-01	G
		92.38	-3.299E-01	% P	1.950E+00	5.80E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
AM-241	2.7706E-03						
		59.54	2.771E-03	&(	5.510E-01	1.63E-01	G

(- This peak used in the nuclide activity average.

* - Peak is too wide, but only one peak in library.
! - Peak is part of a multiplet and this area went negative during deconvolution.
? - Peak is too narrow.
@ - Peak is too wide at FW25M, but ok at FWHM.
% - Peak fails sensitivity test.
$ - Peak identified, but first peak of this nuclide failed one or more qualification tests.
+ - Peak activity higher than counting uncertainty range.
- - Peak activity lower than counting uncertainty range.
= - Peak outside analysis energy range.
& - Calculated peak centroid is not close enough to the library energy centroid for positive identification.
P - Peakbackground subtraction
} - Peak is too close to another for the activity to be found directly.

Nuclide Codes:
T - Thermal Neutron Activation
F - Fast Neutron Activation
I - Fission Product
N - Naturally Occurring Isotope
P - Photon Reaction
C - Charged Particle Reaction
M - No MDA Calculation
R - Coincidence Corrected
H - Halflife limit exceeded

Peak Codes:
G - Gamma Ray
X - X-Ray
P - Positron Decay
S - Single-Escape
D - Double-Escape
K - Key Line
A - Not in Average
C - Coincidence Peak

- -

***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	2.8165E-01	2.8212E-01	2.9818E-01	2.9860E-01	3.049E-01
K-40		9.1635E+00	9.1635E+00	1.4972E+00	1.5831E+00	5.548E-01
MN-54	#A	9.2599E-03	9.2625E-03	3.2414E-02	3.2418E-02	3.774E-02
CO-57	#B	6.7381E-03	6.7403E-03	3.9273E-02	3.9274E-02	4.402E-02
CO-60	#B	-4.9143E-03	-4.9145E-03	4.5126E-02	4.5127E-02	5.123E-02
Sr-85	#A	-2.6616E-03	-2.6652E-03	3.2858E-02	3.2858E-02	3.847E-02
Kr-85	#A	-6.1156E+01	-6.1156E+01	7.5738E+02	7.5738E+02	8.880E+02
Y-88	#B	-2.1384E-05	-2.1402E-05	5.4999E-04	5.4999E-04	5.483E-02
NB-94	#B	-2.9937E-03	-2.9937E-03	2.5104E-02	2.5104E-02	3.117E-02
Ag-108M	#B	-3.7178E-05	-3.7178E-05	3.9004E-02	3.9004E-02	4.715E-02
CD-109	#A	1.9922E-01	1.9926E-01	1.5282E+00	1.5283E+00	1.710E+00

SN-113	#B	8.3590E-04	8.3655E-04	4.1295E-02	4.1295E-02	4.857E-02
SB-125	#B	8.5515E-02	8.5523E-02	9.8304E-02	9.8421E-02	9.206E-02
I-131	#B	0.0000E+00	0.0000E+00	3.9075E-02	3.9075E-02	4.493E-02
CS-134	#B	6.6981E-03	6.6989E-03	2.9459E-02	2.9461E-02	3.431E-02
CS-137	#A	1.7625E-02	1.7626E-02	4.4852E-02	4.4863E-02	5.037E-02
CE-139	#A	-8.3428E-03	-8.3482E-03	4.1579E-02	4.1582E-02	4.415E-02
EU-152	#B	1.5573E-02	1.5573E-02	1.1870E-01	1.1870E-01	1.334E-01
EU-154	#B	1.9656E-02	1.9657E-02	8.6259E-02	8.6266E-02	9.636E-02
EU-155	#B	-2.6974E-03	-2.6975E-03	4.0306E-01	4.0306E-01	1.955E-01
HG-203	#B	7.1476E-03	7.1613E-03	3.0390E-02	3.0392E-02	3.441E-02
TL-208	#	1.4306E-01	1.4306E-01	7.0883E-02	7.1336E-02	
PB-212	#	3.0501E-01	3.0501E-01	9.9376E-02	1.0084E-01	9.285E-02
PB-214	#	2.8931E-01	2.8931E-01	9.3599E-02	9.4997E-02	8.024E-02
BI-212	#B	0.0000E+00	0.0000E+00	2.9516E-01	2.9516E-01	3.575E-01
BI-214		2.7459E-01	2.7459E-01	1.0638E-01	1.0749E-01	
RA-224	#A	-6.7912E-04	-6.7912E-04	1.0394E+00	1.0394E+00	1.080E+00
RA-226	#A	6.6869E-01	6.6869E-01	9.4929E-01	9.5003E-01	1.036E+00
AC-228		3.2835E-01	3.2835E-01	1.6540E-01	1.6642E-01	1.352E-01
TH-227	#	1.2399E+00	1.2399E+00	3.3419E-01	3.4136E-01	2.855E-01
PA-234	#B	-2.3456E-02	-2.3456E-02	1.8869E-01	1.8869E-01	2.113E-01
TH-234	#B	1.2070E+00	1.2070E+00	3.3145E+00	3.3152E+00	3.674E+00
AM-241	#A	2.7706E-03	2.7706E-03	4.8813E-01	4.8813E-01	5.510E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (295.7 to 1999.0 keV) 9.9095392E+00 pCi/gm
Total Decayed Activity (295.7 to 1999.0 keV) 9.9095392E+00 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
DAT

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 102F_25JUL2006_1728.An1

Sample description
FSS-OOL-05-05-016-F

Spectrum Filename: C:\GammaVision\Spectra\102F_25JUL2006_1728.An1

Acquisition information
Start time: 25-Jul-2006 17:28:14
Live time: 2000
Real time: 2015
Dead time: 0.77 %
Detector ID: 3

Detector system
Det 102 - DSPP-468

Calibration
Filename: D2_1LSa.Clb
DET 102 1 Liter Sand Geometry

Energy Calibration
Created: 15-Jan-2005 03:09:29
Zero offset: 0.220 keV
Gain: 0.500 keV/channel
Quadratic: -6.435E-08 keV/channel^2

Efficiency Calibration
Created: 15-Jan-2005 06:48:10
Type: Polynomial
Uncertainty: 0.497 %
Coefficients: -0.294180 -5.980622 0.744607
-0.096737 0.005214 -0.000120

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.22keV)
Stop channel: 4000 (1999.02keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 1.7110E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.7110E+03) =
5.8445E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	24-Jul-2006 09:42:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	102_150K_28APR05.Pbc 01-May-2005 05:27:47
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 12 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.4883

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
77.27	142.	28.02	1.50	9.541E-03	77.11	10.700	1.102E+00	PB214
					77.11	17.500	6.740E-01	PB212
77.27	142.	28.02	1.50	9.541E-03	77.11	10.700	1.102E+00	PB214
					77.11	17.500	6.740E-01	PB212
93.53	81.	34.63	1.82	1.347E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	1.600E+00	TH234
239.22	608.	6.15	1.02	1.378E-02	238.63	43.100	8.066E-01	PB212
270.03	65.	35.01	1.72	1.244E-02				
295.69	89.	22.50	1.27	1.145E-02	295.22	19.200	3.193E-01	PB214
338.89	114.	14.80	1.23	1.005E-02	338.40	12.010	7.446E-01	AC228
352.64	194.	12.95	1.42	9.661E-03	351.99	37.100	4.259E-01	PB214
511.66	48.	26.59	1.50	6.695E-03	510.72	22.500	2.519E-01	TL208
					513.99	0.004	1.326E+03	Kr85
					514.00	99.270	5.828E-02	Sr85
511.81	45.	25.21	1.50	6.653E-03	510.72	22.500	PBC<MDA	TL208
					513.99	0.004	1.247E+03	Kr85
					514.00	99.270	5.477E-02	Sr85
511.81	45.	25.21	1.50	6.653E-03	510.72	22.500	2.368E-01	TL208
					513.99	0.004	1.247E+03	Kr85
					514.00	99.270	5.477E-02	Sr85
584.28	132.	12.27	1.36	5.879E-03	583.14	86.000	2.055E-01	TL208
729.04	66.	20.02	1.30	4.783E-03	727.17	11.800	9.256E-01	BI212
796.88	21.	39.79	1.60	4.420E-03	795.76	85.400	PBC<MDA	CS134
913.06	95.	13.23	1.95	3.914E-03	911.07	29.000	6.595E-01	AC228
969.86	82.	17.17	0.94	3.715E-03				
1121.58	44.	32.83	0.75	3.283E-03	1120.28	15.040	6.974E-01	BI214
1463.42	365.	5.23	2.28	2.617E-03				

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
478.08	239.22	724.	130.	0.065	91.62	1.021	PB-212	M
539.70	270.03	158.	65.	0.033	105.03	1.717	AC-228	sM
1221.75	610.95	44.	140.	0.070	36.07	1.539	RU-103	l
1458.04	729.04	64.	32.	0.016	118.72	1.304	J-132	sM
1939.92	969.86	29.	84.	0.042	42.62	0.938	AC-228	sM
2927.75	1463.42	0.	365.	0.183	15.70	2.280	K-40	M

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.
M - Peak is close to a library peak.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-214	153.80	77.11	726.	142.	0.071	84.07	1.500D
PB-212	153.80	77.11	726.	142.	0.071	84.07	1.500D
TH-234	186.01	93.22	616.	93.	0.047	117.16	1.500s
PB-212	477.80	239.09	282.	442.	0.221	21.52	1.500
PB-214	591.37	295.86	122.	96.	0.048	57.57	1.500
AC-228	677.85	339.09	88.	106.	0.053	47.74	1.500
PB-214	704.96	352.64	83.	165.	0.083	32.91	1.500
TL-208	1023.11	511.66	58.	48.	0.024	79.77	1.499s
Kr-85	1023.41	511.81	42.	45.	0.023	75.64	1.499s
Sr-85	1023.41	511.81	42.	45.	0.023	75.64	1.499s
TL-208	1168.65	584.41	26.	139.	0.069	29.70	1.499
BI-212	1457.14	728.59	26.	34.	0.017	81.27	1.554
CS-134	1593.77	796.88	25.	21.	0.011	119.37	1.601s
AC-228	1826.10	912.98	19.	89.	0.045	37.78	1.679
BI-214	2243.56	1121.58	38.	44.	0.022	98.49	0.754s

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	MDA Value pCi/gm	COMMENTS
BE-7		-9.8538E-02					
			477.56	-9.854E-02	%(	4.659E-01 1.36E-01	G
K-40		-4.2560E-03					
			1460.75	-4.256E-03	%(P	1.140E+00 3.23E-01	G
MN-54		1.2330E-03					
			834.81	1.233E-03	%(P	6.129E-02 1.71E-02	G
CO-57		1.3540E-02					
			122.07	1.354E-02	%(	5.410E-02 1.62E-02	G K
			136.43	-1.154E-01	%	4.121E-01 1.24E-01	G
CO-60		-5.0747E-03					
			1332.51	-5.075E-03	%(P	5.987E-02 1.63E-02	G K
			1173.23	2.775E-02	&	6.483E-02 1.95E-02	G K
Sr-85		5.4770E-02					
			514.00	5.477E-02	&(	4.002E-02 1.38E-02	G
Kr-85		1.2467E+03					
			513.99	1.247E+03	&(	9.109E+02 3.14E+02	G
Y-88		-4.7572E-03					
			1836.01	-4.757E-03	%(P	4.825E-02 1.23E-02	G K
			898.02	3.229E-03	& P	4.750E-02 1.28E-02	G
NB-94		-2.4438E-03					
			871.10	-2.444E-03	%(	4.521E-02 1.23E-02	G K
			702.50	1.160E-04	%	4.064E-02 1.10E-02	G K
Ag-108M		-4.5199E-03					
			722.95	-4.520E-03	%(	4.569E-02 1.27E-02	G K
			614.37	-4.763E-02	& P	8.874E-02 2.70E-02	G
			433.93	1.208E-03	&	3.463E-02 9.66E-03	G
CD-109		-7.9118E-02					
			88.04	-7.912E-02	%(P	2.299E+00 6.84E-01	G
SN-113		-8.8970E-03					
			391.71	-8.897E-03	%(	5.912E-02 1.71E-02	G K
			255.04	4.420E-01	&	1.879E+00 5.58E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	-2.0183E-02						
		427.95	-2.018E-02	%(P	1.487E-01	4.28E-02	G K
		600.77	-4.973E-02	% P	2.369E-01	6.83E-02	G
		636.15	-1.047E-01	% P	4.362E-01	1.27E-01	G
		463.51	-1.660E-02	% P	3.853E-01	1.06E-01	G
		176.29	1.206E-01	% P	6.380E-01	1.89E-01	G
I-131	1.5781E-02						
		364.48	1.578E-02	&(	3.633E-02	1.09E-02	G K
		636.97	-1.759E-01	%	7.166E-01	2.09E-01	G
		284.29	2.141E-01	%	6.140E-01	1.84E-01	G
CS-134	2.0865E-02						
		604.66	0.000E+00	%(	5.090E-02	1.43E-02	G K
		795.76	4.471E-02	@(	5.486E-02	1.78E-02	G
		569.29	-4.102E-03	&	2.363E-01	6.50E-02	G
		801.84	-1.614E-01	% P	6.812E-01	1.98E-01	G
CS-137	-3.4012E-04						
		661.62	-3.401E-04	%(	3.810E-02	1.01E-02	G
CE-139	1.3235E-02						
		165.85	1.323E-02	%(P	4.969E-02	1.49E-02	G
EU-152	3.6572E-02						
		121.78	3.657E-02	%(P	1.583E-01	4.73E-02	G K
		344.30	2.718E-02	%	1.336E-01	3.92E-02	G
		1408.08	0.000E+00	%	1.522E-01	3.49E-02	G
		964.00	-2.041E-04	% P	3.473E-01	9.32E-02	G
		1112.07	1.690E-01	%	4.551E-01	1.35E-01	G
		778.90	-2.271E-02	& P	3.385E-01	9.31E-02	G
EU-154	1.3544E-02						
		123.10	1.354E-02	&(P	1.055E-01	3.13E-02	G K
		1274.80	-1.446E-03	%	1.868E-01	5.06E-02	G
		723.30	-2.467E-02	% P	2.199E-01	6.12E-02	G
		1004.80	8.076E-02	%	3.130E-01	9.05E-02	G
EU-155	-5.5409E-03						
		86.45	-5.541E-03	%(P	2.714E-01	8.05E-02	G K
		105.31	3.681E-03	&	2.352E-01	6.95E-02	G
HG-203	-1.5438E-03						
		279.17	-1.544E-03	&(P	5.288E-02	1.54E-02	G K
		72.87	-2.160E-01	&	2.009E+00	6.00E-01	G
		70.83	-7.345E-01	%	3.879E+00	1.16E+00	G
		82.50	-1.127E+00	%	3.671E+00	1.10E+00	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	2.2344E-01						
		583.14	2.160E-01	(P	4.095E-02	2.14E-02	G
		510.72	2.519E-01	*(	1.996E-01	6.70E-02	G
PB-212	6.1226E-01						
		238.63	5.872E-01	(	1.075E-01	4.21E-02	G K
							Energy duplication
		77.11	6.740E-01	(	6.068E-01	1.89E-01	G
		74.81	6.057E-01	& P	1.238E+00	3.75E-01	G
PB-214	3.5733E-01						
		351.99	3.638E-01	(P	9.929E-02	4.00E-02	G K
		295.22	3.448E-01	(	1.944E-01	6.62E-02	G
							Energy duplication
		77.11	1.102E+00	+	9.924E-01	3.09E-01	G
		241.92	2.188E-01	%	7.297E-01	2.19E-01	G
BI-212	4.7933E-01						
		727.17	4.793E-01	(	3.701E-01	1.30E-01	G K
		1620.56	-3.267E-01	% P	2.203E+00	5.91E-01	G
		785.42	-6.834E-02	% P	2.734E+00	7.61E-01	G
BI-214	1.7158E-01						
		609.32	0.000E+00	&(	1.224E-01	3.46E-02	G K
		1764.51	-1.932E-03	% P	1.643E-01	2.23E-02	G
		1120.28	6.974E-01	(	5.052E-01	2.29E-01	G
RA-224	5.0337E-01						
		241.00	5.034E-01	%(P	1.387E+00	4.17E-01	G
RA-226	6.1429E-01						
		185.99	6.143E-01	%(P	1.235E+00	3.74E-01	G
AC-228	6.3985E-01						
		911.07	6.190E-01	(P	1.594E-01	7.82E-02	G K
		968.90	-2.122E-02	% P	4.029E-01	1.13E-01	G
		338.40	6.903E-01	(	3.041E-01	1.10E-01	G
TH-227	-2.3162E-01						
		236.00	-2.316E-01	%(P	5.082E-01	1.54E-01	G K
		256.25	1.370E-01	%	5.307E-01	1.58E-01	G
PA-234	7.0420E-02						
		98.44	7.042E-02	%(	2.360E-01	7.09E-02	G K
		946.00	3.150E-02	%	2.533E-01	7.07E-02	G
		131.28	-6.535E-05	&	2.205E-01	6.50E-02	G
		94.67	-1.922E-01	%	4.397E-01	1.33E-01	G
		883.24	-2.940E-02	%	3.310E-01	8.97E-02	G
		926.70	-8.825E-02	%	4.890E-01	1.39E-01	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26-2.228E-03 &   3.650E-01 1.01E-01 G

TH-234       1.3271E+00
                           63.29 9.318E-01 &(P 4.688E+00 1.40E+00 G K
                           92.80 1.841E+00  (  2.338E+00 7.19E-01 G
                           92.38-1.013E-01 & P 2.773E+00 8.23E-01 G

AM-241      -3.0651E-02
                           59.54-3.065E-02 %(  7.071E-01 2.10E-01 G
   ( - This peak used in the nuclide activity average.

   * - Peak is too wide, but only one peak in library.
   ! - Peak is part of a multiplet and this area went
       negative during deconvolution.
   ? - Peak is too narrow.
   @ - Peak is too wide at FW25M, but ok at FWHM.
   % - Peak fails sensitivity test.
   $ - Peak identified, but first peak of this nuclide
       failed one or more qualification tests.
   + - Peak activity higher than counting uncertainty range.
   - - Peak activity lower than counting uncertainty range.
   = - Peak outside analysis energy range.
   & - Calculated peak centroid is not close enough to the
       library energy centroid for positive identification.
   P - Peakbackground subtraction
   } - Peak is too close to another for the activity
       to be found directly.

   Nuclide Codes:                      Peak Codes:
   T - Thermal Neutron Activation      G - Gamma Ray
   F - Fast Neutron Activation         X - X-Ray
   I - Fission Product                 P - Positron Decay
   N - Naturally Occurring Isotope     S - Single-Escape
   P - Photon Reaction                 D - Double-Escape
   C - Charged Particle Reaction       K - Key Line
   M - No MDA Calculation              A - Not in Average
   R - Coincidence Corrected           C - Coincidence Peak
   H - Halflife limit exceeded

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
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***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	-9.6860E-02	-9.8538E-02	4.0928E-01	4.0931E-01	4.580E-01
K-40	#A	-4.2560E-03	-4.2560E-03	2.9247E-01	2.9247E-01	1.140E+00
MN-54	#A	1.2294E-03	1.2330E-03	5.1325E-02	5.1325E-02	6.111E-02
CO-57	#B	1.3494E-02	1.3540E-02	4.8591E-02	4.8597E-02	5.392E-02
CO-60	#B	-5.0722E-03	-5.0747E-03	5.3130E-02	5.3131E-02	5.984E-02

Sr-85	#	5.4001E-02	5.4770E-02	4.1428E-02	4.1542E-02	3.946E-02
Kr-85	#	1.2467E+03	1.2467E+03	9.4297E+02	9.4556E+02	9.109E+02
Y-88	#B	-4.7164E-03	-4.7572E-03	3.7299E-02	3.7300E-02	4.784E-02
NB-94	#B	-2.4438E-03	-2.4438E-03	3.6962E-02	3.6963E-02	4.521E-02
Ag-108M	#B	-4.5199E-03	-4.5199E-03	3.8112E-02	3.8113E-02	4.569E-02
CD-109	#A	-7.8958E-02	-7.9118E-02	3.9599E+00	3.9599E+00	2.295E+00
SN-113	#B	-8.8263E-03	-8.8970E-03	5.1433E-02	5.1435E-02	5.865E-02
SB-125	#B	-2.0165E-02	-2.0183E-02	1.7944E-01	1.7944E-01	1.486E-01
I-131	#B	1.4079E-02	1.5781E-02	3.2827E-02	3.2839E-02	3.241E-02
CS-134	#B	2.0839E-02	2.0865E-02	2.4906E-02	2.4934E-02	5.084E-02
CS-137	#A	-3.4009E-04	-3.4012E-04	3.0375E-02	3.0375E-02	3.810E-02
CE-139	#A	1.3147E-02	1.3235E-02	4.4570E-02	4.4576E-02	4.936E-02
EU-152	#B	3.6565E-02	3.6572E-02	1.4193E-01	1.4195E-01	1.582E-01
EU-154	#B	1.3540E-02	1.3544E-02	9.3952E-02	9.3955E-02	1.055E-01
EU-155	#B	-5.5381E-03	-5.5409E-03	1.4910E+00	1.4910E+00	2.712E-01
HG-203	#B	-1.5137E-03	-1.5438E-03	5.1006E-02	5.1006E-02	5.185E-02
TL-208	#	2.2344E-01	2.2344E-01	6.6565E-02	6.7736E-02	4.095E-02
PB-212	#	6.1226E-01	6.1226E-01	1.3173E-01	1.3614E-01	1.075E-01
PB-214	#	3.5733E-01	3.5733E-01	1.1789E-01	1.1958E-01	9.929E-02
BI-212		4.7933E-01	4.7933E-01	3.8956E-01	3.9049E-01	3.701E-01
BI-214	#F	1.7158E-01	1.7158E-01	1.6899E-01	1.6926E-01	1.224E-01
RA-224	#A	5.0337E-01	5.0337E-01	1.2521E+00	1.2524E+00	1.387E+00
RA-226	#A	6.1429E-01	6.1429E-01	1.1208E+00	1.1213E+00	1.235E+00
AC-228		6.3985E-01	6.3985E-01	1.9498E-01	1.9826E-01	1.594E-01
TH-227	#B	-2.3162E-01	-2.3162E-01	4.6737E-01	4.6755E-01	5.082E-01
PA-234	#B	7.0420E-02	7.0420E-02	2.1270E-01	2.1274E-01	2.360E-01
TH-234	#B	1.3271E+00	1.3271E+00	1.5548E+00	1.5566E+00	4.688E+00
AM-241	#A	-3.0651E-02	-3.0651E-02	6.2964E-01	6.2964E-01	7.071E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (50.2 to 1999.0 keV) 1.2907593E+00 pCi/gm
Total Decayed Activity (50.2 to 1999.0 keV) 1.2907593E+00 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
DAT

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 102F_25JUL2006_1805.An1

Sample description
FSS-OOL-05-05-006-F

Spectrum Filename: C:\GammaVision\Spectra\102F_25JUL2006_1805.An1

Acquisition information
Start time: 25-Jul-2006 18:05:26
Live time: 2000
Real time: 2018
Dead time: 0.91 %
Detector ID: 3

Detector system
Det 102 - DSPP-468

Calibration
Filename: D2_1LSa.Clb
DET 102 1 Liter Sand Geometry

Energy Calibration
Created: 15-Jan-2005 03:09:29
Zero offset: 0.220 keV
Gain: 0.500 keV/channel
Quadratic: -6.435E-08 keV/channel^2

Efficiency Calibration
Created: 15-Jan-2005 06:48:10
Type: Polynomial
Uncertainty: 0.497 %
Coefficients: -0.294180 -5.980622 0.744607
-0.096737 0.005214 -0.000120

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.22keV)
Stop channel: 4000 (1999.02keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 2.0750E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 2.0750E+03) =
4.8193E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	24-Jul-2006 10:15:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	102_150K_28APR05.Pbc 01-May-2005 05:27:47
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 11 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.7148

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
77.20	169.	24.67	1.50	9.541E-03	77.11	10.700	1.076E+00	PB214
					77.11	17.500	6.580E-01	PB212
77.20	169.	24.67	1.50	9.541E-03	77.11	10.700	1.076E+00	PB214
					77.11	17.500	6.580E-01	PB212
186.28	77.	37.60	1.07	1.625E-02	185.99	3.280	PBC<MDA	RA226
199.66	62.	38.52	1.56	1.565E-02				
210.01	86.	31.51	1.19	1.516E-02				
239.23	596.	7.24	1.14	1.378E-02	238.63	43.100	6.529E-01	PB212
270.99	48.	40.84	0.96	1.240E-02				
296.03	129.	12.91	1.26	1.144E-02	295.22	19.200	3.825E-01	PB214
300.82	39.	34.17	1.26	1.127E-02				
338.96	103.	22.79	1.11	1.004E-02	338.40	12.010	5.557E-01	AC228
352.57	222.	12.97	1.25	9.663E-03	351.99	37.100	4.025E-01	PB214
463.95	50.	40.15	0.95	7.358E-03	463.51	10.000	4.324E-01	SB125
510.96	90.	18.76	0.81	6.695E-03	510.72	22.500	3.908E-01	TL208
584.31	155.	14.07	1.17	5.879E-03	583.14	86.000	1.982E-01	TL208
610.60	170.	10.76	1.41	5.638E-03	609.32	46.090	4.265E-01	BI214
912.94	115.	11.29	1.70	3.915E-03	911.07	29.000	6.583E-01	AC228
970.17	81.	19.02	1.58	3.714E-03	968.90	17.460	8.163E-01	AC228
1121.93	58.	29.81	1.20	3.279E-03	1120.28	15.040	7.584E-01	BI214
1463.44	543.	4.55	1.68	2.617E-03	1460.75	10.700	1.260E+01	K40

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide

372.18	186.28	321.	77.	0.039	112.79	1.072	PA-234	l
398.93	199.66	221.	62.	0.031	115.55	1.559	SE-75	sM
419.64	210.01	262.	86.	0.043	94.52	1.192	NP-239	M

Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM	Suspected	
478.10	239.23	804.	155.	0.078	81.00	1.136	PB-212	M
541.61	270.99	147.	48.	0.024	122.53	0.959	AC-228	M
601.30	300.74	69.	39.	0.019	102.51	1.259	PB-212	lD
677.59	338.96	140.	108.	0.054	54.55	1.109	AC-228	M
927.65	463.95	106.	50.	0.025	120.44	0.949	SB-125	l

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.
M - Peak is close to a library peak.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-214	153.80	77.11	782.	169.	0.084	74.02	1.500D
PB-212	153.80	77.11	782.	169.	0.084	74.02	1.500D
PB-212	477.91	239.14	373.	424.	0.212	24.19	1.500
PB-214	591.53	295.94	155.	127.	0.063	49.53	1.500
PB-214	704.97	352.64	122.	176.	0.088	34.94	1.500s
TL-208	1021.69	510.96	62.	90.	0.045	56.27	0.812s
TL-208	1168.45	584.31	89.	154.	0.077	42.20	1.169
BI-214	1221.05	610.60	48.	170.	0.085	32.29	1.407s
AC-228	1826.14	913.00	26.	108.	0.054	35.02	1.679
AC-228	1941.87	970.83	36.	49.	0.024	67.31	1.718
BI-214	2244.26	1121.93	52.	58.	0.029	89.42	1.201s
K-40	2927.87	1463.48	8.	518.	0.259	13.38	2.042

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	Peak MDA Value pCi/gm	COMMENTS
BE-7		3.0279E-02					
			477.56	3.028E-02	&(	2.566E-01 7.24E-02	G
K-40		1.2019E+01					
			1460.75	1.202E+01	(P	3.666E-01 5.36E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
MN-54	1.6649E-02						
		834.81	1.665E-02	%(P	3.708E-02	1.12E-02	G
CO-57	-8.3112E-03						
		122.07	-8.311E-03	%(	5.324E-02	1.59E-02	G K
		136.43	-1.057E-02	&	3.832E-01	1.14E-01	G
CO-60	2.7742E-03						
		1332.51	2.774E-03	%(P	5.655E-02	1.55E-02	G K
		1173.23	1.166E-02	%	6.330E-02	1.82E-02	G K
Sr-85	-1.4049E-02						
		514.00	-1.405E-02	%(	5.073E-02	1.50E-02	G
Kr-85	-3.1976E+02						
		513.99	-3.198E+02	%(	1.155E+03	3.43E+02	G
Y-88	7.5882E-03						
		1836.01	7.588E-03	&(P	2.573E-02	7.15E-03	G K
		898.02	-2.369E-03	% P	5.297E-02	1.46E-02	G
NB-94	0.0000E+00						
		871.10	0.000E+00	&(	4.459E-02	1.22E-02	G K
		702.50	0.000E+00	%	4.680E-02	1.31E-02	G K
Ag-108M	1.0947E-02						
		722.95	1.095E-02	%(	3.457E-02	1.01E-02	G K
		614.37	-4.188E-02	& P	6.678E-02	2.05E-02	G
		433.93	3.155E-04	%	3.733E-02	1.06E-02	G
CD-109	-3.5552E-02						
		88.04	-3.555E-02	%(P	1.946E+00	5.79E-01	G
SN-113	2.9887E-03						
		391.71	2.989E-03	&(	5.166E-02	1.48E-02	G K
		255.04	4.124E-01	%	1.655E+00	4.93E-01	G
SB-125	-3.5492E-02						
		427.95	-3.549E-02	%(P	1.263E-01	3.71E-02	G K
		600.77	3.000E-02	& P	1.968E-01	5.62E-02	G
		636.15	2.534E-03	% P	3.867E-01	1.09E-01	G
		463.51	2.621E-01	% P	4.035E-01	1.24E-01	G
		176.29	2.222E-01	% P	5.831E-01	1.76E-01	G
I-131	1.1529E-02						
		364.48	1.153E-02	%(	4.030E-02	1.19E-02	G K
		636.97	-3.979E-02	&	6.582E-01	1.86E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
		284.29	-1.292E-01	%	7.082E-01	2.10E-01	G
CS-134	-1.2497E-03						
		604.66	-1.250E-03	%(	5.505E-02	1.58E-02	G K
		795.76	1.516E-02	%	4.380E-02	1.29E-02	G
		569.29	-4.925E-02	&	2.682E-01	7.79E-02	G
		801.84	-5.031E-04	& P	4.031E-01	1.08E-01	G
CS-137	-6.4239E-03						
		661.62	-6.424E-03	&(	4.189E-02	1.19E-02	G
CE-139	1.0910E-02						
		165.85	1.091E-02	%(P	4.860E-02	1.45E-02	G
EU-152	-3.1541E-02						
		121.78	-3.154E-02	%(P	1.485E-01	4.44E-02	G K
		344.30	3.218E-04	%	1.411E-01	4.08E-02	G
		1408.08	-2.056E-03	%	2.131E-01	5.55E-02	G
		964.00	-3.197E-02	% P	4.018E-01	1.13E-01	G
		1112.07	-4.995E-02	%	4.229E-01	1.19E-01	G
		778.90	-4.308E-02	% P	3.766E-01	1.07E-01	G
EU-154	-1.6566E-02						
		123.10	-1.657E-02	%(P	1.050E-01	3.13E-02	G K
		1274.80	-7.991E-04	&	1.684E-01	4.60E-02	G
		723.30	-1.440E-02	% P	1.614E-01	4.41E-02	G
		1004.80	-2.659E-02	%	3.092E-01	8.70E-02	G
EU-155	-7.1920E-02						
		86.45	-7.192E-02	&(P	2.377E-01	7.14E-02	G K
		105.31	1.562E-02	%	2.250E-01	6.69E-02	G
HG-203	1.6696E-02						
		279.17	1.670E-02	&(P	3.883E-02	1.17E-02	G K
		72.87	-9.428E-01	%	1.918E+00	5.82E-01	G
		70.83	1.077E+00	&	2.905E+00	8.77E-01	G
		82.50	-2.017E-02	%	3.321E+00	9.86E-01	G
TL-208	1.9825E-01						
		583.14	1.982E-01	(P	5.995E-02	2.80E-02	G
		510.72	3.908E-01	+	1.698E-01	7.33E-02	G
PB-212	4.6413E-01						
		238.63	4.641E-01	(	1.014E-01	3.74E-02	G K
							Energy duplication
		77.11	6.580E-01	+	5.188E-01	1.62E-01	G
							Energy duplication
		74.81	6.946E-01	& P	1.073E+00	3.27E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
PB-214	3.3756E-01						
		351.99	3.184E-01	@(P	9.839E-02	3.72E-02	G K
		295.22	3.746E-01	(	1.798E-01	6.18E-02	G
							Energy duplication
		77.11	1.076E+00	+	8.485E-01	2.66E-01	G
		241.92	6.797E-03	%	5.796E-01	1.71E-01	G
BI-212	-8.6932E-02						
		727.17	-8.693E-02	%(	3.776E-01	1.10E-01	G K
		1620.56	-3.315E-02	% P	7.281E-01	9.88E-02	G
		785.42	-6.765E-01	& P	2.815E+00	8.25E-01	G
BI-214	4.2646E-01						
		609.32	4.265E-01	@(	8.711E-02	4.60E-02	G K
		1764.51	-1.593E-03	% P	3.083E-01	7.81E-02	G
		1120.28	7.584E-01	+	4.811E-01	2.26E-01	G
RA-224	1.9283E-01						
		241.00	1.928E-01	%(P	1.230E+00	3.66E-01	G
RA-226	7.3185E-01						
		185.99	7.318E-01	%(P	1.205E+00	3.67E-01	G
AC-228	6.2001E-01						
		911.07	6.200E-01	(P	1.521E-01	7.25E-02	G K
		968.90	4.908E-01	- P	3.072E-01	1.10E-01	G
		338.40	-2.869E-02	%	3.249E-01	9.50E-02	G
TH-227	-1.2979E-01						
		236.00	-1.298E-01	%(P	4.115E-01	1.24E-01	G K
		256.25	-8.650E-02	%	4.386E-01	1.30E-01	G
PA-234	7.8543E-02						
		98.44	7.854E-02	%(	2.154E-01	6.50E-02	G K
		946.00	7.115E-02	%	2.200E-01	6.46E-02	G
		131.28	3.123E-02	&	1.977E-01	5.90E-02	G
		94.67	1.763E-01	%	3.688E-01	1.12E-01	G
		883.24	-5.792E-02	&	3.524E-01	9.99E-02	G
		926.70	7.823E-02	%	4.259E-01	1.22E-01	G
		569.26	-7.298E-02	&	3.974E-01	1.15E-01	G
TH-234	9.0297E-01						
		63.29	9.030E-01	&(P	3.651E+00	1.09E+00	G K
		92.80	1.017E+00	&	2.168E+00	6.57E-01	G
		92.38	3.330E-01	& P	2.008E+00	5.99E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
AM-241	8.2621E-02						
		59.54	8.262E-02	%(	4.645E-01	1.38E-01	G

(- This peak used in the nuclide activity average.

* - Peak is too wide, but only one peak in library.
! - Peak is part of a multiplet and this area went negative during deconvolution.
? - Peak is too narrow.
@ - Peak is too wide at FW25M, but ok at FWHM.
% - Peak fails sensitivity test.
$ - Peak identified, but first peak of this nuclide failed one or more qualification tests.
+ - Peak activity higher than counting uncertainty range.
- - Peak activity lower than counting uncertainty range.
= - Peak outside analysis energy range.
& - Calculated peak centroid is not close enough to the library energy centroid for positive identification.
P - Peakbackground subtraction
} - Peak is too close to another for the activity to be found directly.

Nuclide Codes:
T - Thermal Neutron Activation
F - Fast Neutron Activation
I - Fission Product
N - Naturally Occurring Isotope
P - Photon Reaction
C - Charged Particle Reaction
M - No MDA Calculation
R - Coincidence Corrected
H - Halflife limit exceeded

Peak Codes:
G - Gamma Ray
X - X-Ray
P - Positron Decay
S - Single-Escape
D - Double-Escape
K - Key Line
A - Not in Average
C - Coincidence Peak

- -

***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	2.9762E-02	3.0279E-02	2.1717E-01	2.1718E-01	2.523E-01
K-40		1.2019E+01	1.2019E+01	1.6087E+00	1.7443E+00	3.666E-01
MN-54	#A	1.6600E-02	1.6649E-02	3.3525E-02	3.3538E-02	3.697E-02
CO-57	#B	-8.2830E-03	-8.3112E-03	4.7712E-02	4.7714E-02	5.306E-02
CO-60	#B	2.7729E-03	2.7742E-03	4.6393E-02	4.6394E-02	5.652E-02
Sr-85	#A	-1.3852E-02	-1.4049E-02	4.5146E-02	4.5153E-02	5.002E-02
Kr-85	#A	-3.1975E+02	-3.1976E+02	1.0275E+03	1.0277E+03	1.155E+03
Y-88	#B	7.5230E-03	7.5882E-03	2.1457E-02	2.1461E-02	2.551E-02
NB-94	#B	0.0000E+00	0.0000E+00	3.6657E-02	3.6658E-02	4.459E-02
Ag-108M	#B	1.0946E-02	1.0947E-02	3.0319E-02	3.0326E-02	3.457E-02
CD-109	#A	-3.5479E-02	-3.5552E-02	6.5825E+00	6.5825E+00	1.943E+00

SN-113	#B	2.9649E-03	2.9887E-03	4.4494E-02	4.4494E-02	5.125E-02
SB-125	#B	-3.5460E-02	-3.5492E-02	1.3007E-01	1.3009E-01	1.262E-01
I-131	#B	1.0283E-02	1.1529E-02	3.5739E-02	3.5744E-02	3.594E-02
CS-134	#B	-1.2482E-03	-1.2497E-03	4.7364E-02	4.7364E-02	5.498E-02
CS-137	#A	-6.4234E-03	-6.4239E-03	3.5717E-02	3.5719E-02	4.188E-02
CE-139	#A	1.0837E-02	1.0910E-02	4.3594E-02	4.3598E-02	4.828E-02
EU-152	#B	-3.1535E-02	-3.1541E-02	1.4336E-01	1.4337E-01	1.484E-01
EU-154	#B	-1.6561E-02	-1.6566E-02	9.6197E-02	9.6201E-02	1.049E-01
EU-155	#B	-7.1884E-02	-7.1920E-02	2.5557E-01	2.5561E-01	2.376E-01
HG-203	#B	1.6370E-02	1.6696E-02	3.5154E-02	3.5166E-02	3.807E-02
TL-208		1.9825E-01	1.9825E-01	8.3872E-02	8.4607E-02	
PB-212	#	4.6413E-01	4.6413E-01	1.1228E-01	1.1526E-01	1.014E-01
PB-214	#	3.3756E-01	3.3756E-01	1.0238E-01	1.0412E-01	9.839E-02
BI-212	#B	-8.6932E-02	-8.6932E-02	3.2934E-01	3.2937E-01	3.776E-01
BI-214		4.2646E-01	4.2646E-01	1.3770E-01	1.3976E-01	
RA-224	#A	1.9283E-01	1.9283E-01	1.0990E+00	1.0990E+00	1.230E+00
RA-226	#A	7.3184E-01	7.3185E-01	1.1017E+00	1.1024E+00	1.205E+00
AC-228		6.2001E-01	6.2001E-01	2.1758E-01	2.2034E-01	1.521E-01
TH-227	#B	-1.2979E-01	-1.2979E-01	3.7767E-01	3.7774E-01	4.115E-01
PA-234	#B	7.8543E-02	7.8543E-02	1.9496E-01	1.9501E-01	2.154E-01
TH-234	#B	9.0297E-01	9.0297E-01	3.2811E+00	3.2815E+00	3.651E+00
AM-241	#A	8.2620E-02	8.2621E-02	4.1482E-01	4.1484E-01	4.645E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (50.2 to 1999.0 keV) 1.3263260E+01 pCi/gm
Total Decayed Activity (50.2 to 1999.0 keV) 1.3263260E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
DAT

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 102F_25JUL2006_1842.An1

Sample description
FSS-OOL-05-05-015-F

Spectrum Filename: C:\GammaVision\Spectra\102F_25JUL2006_1842.An1

Acquisition information
Start time: 25-Jul-2006 18:42:18
Live time: 2000
Real time: 2016
Dead time: 0.80 %
Detector ID: 3

Detector system
Det 102 - DSPP-468

Calibration
Filename: D2_1LSa.Clb
DET 102 1 Liter Sand Geometry

Energy Calibration
Created: 15-Jan-2005 03:09:29
Zero offset: 0.220 keV
Gain: 0.500 keV/channel
Quadratic: -6.435E-08 keV/channel^2

Efficiency Calibration
Created: 15-Jan-2005 06:48:10
Type: Polynomial
Uncertainty: 0.497 %
Coefficients: -0.294180 -5.980622 0.744607
-0.096737 0.005214 -0.000120

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.22keV)
Stop channel: 4000 (1999.02keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 2.0110E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 2.0110E+03) =
4.9727E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	24-Jul-2006 07:29:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	102_150K_28APR05.Pbc 01-May-2005 05:27:47
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 9 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.7439

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
77.25	100.	40.14	1.50	9.541E-03	77.11	10.700	PBC<MDA	PB214
					77.11	17.500	4.019E-01	PB212
77.25	100.	40.14	1.50	9.541E-03	77.11	10.700	6.573E-01	PB214
					77.11	17.500	4.019E-01	PB212
186.54	72.	34.95	0.87	1.624E-02	185.99	3.280	PBC<MDA	RA226
239.08	362.	6.42	1.22	1.379E-02	238.63	43.100	4.090E-01	PB212
242.72	54.	29.16	1.22	1.362E-02	241.00	3.900	PBC<MDA	RA224
					241.92	7.470	3.532E-01	PB214
295.72	119.	14.72	1.51	1.145E-02	295.22	19.200	3.636E-01	PB214
338.59	76.	28.95	1.03	1.005E-02	338.40	12.010	4.227E-01	AC228
352.48	190.	10.93	1.16	9.665E-03	351.99	37.100	3.556E-01	PB214
387.17	24.	34.27	1.50	8.706E-03	391.71	64.170	PBC<MDA	SN113
463.60	27.	38.23	1.50	7.365E-03	463.51	10.000	PBC<MDA	SB125
511.82	77.	20.01	1.18	6.681E-03	510.72	22.500	3.431E-01	TL208
583.99	123.	15.19	1.28	5.882E-03	583.14	86.000	1.626E-01	TL208
610.60	116.	13.71	1.11	5.638E-03	609.32	46.090	2.991E-01	BI214
913.20	67.	17.26	1.82	3.914E-03				
970.66	27.	30.09	1.72	3.718E-03	968.90	17.460	2.750E-01	AC228
1463.48	474.	4.72	2.22	2.617E-03	1460.75	10.700	1.135E+01	K40

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

Peak Centroid Channel	Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
477.79	239.05	89.	362.	0.181	19.25	1.215	PB-212	D
485.06	242.68	95.	54.	0.027	87.49	1.218	XE-138	D

Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM	Suspected
1826.54	913.20	21.	69.	0.034	45.91	1.816	AC-228

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-214	153.80	77.11	753.	100.	0.050	120.42	1.500D
PB-212	153.80	77.11	753.	100.	0.050	120.42	1.500D
RA-226	372.53	186.46	308.	65.	0.032	112.55	1.500s
PB-212	477.81	239.09	254.	323.	0.161	26.78	1.500
PB-214	591.31	295.83	107.	111.	0.056	48.66	1.500s
AC-228	677.60	338.96	100.	63.	0.031	77.58	1.500
PB-214	704.89	352.61	84.	162.	0.081	33.48	1.500s
SN-113	774.03	387.17	21.	24.	0.012	102.80	1.500s
SB-125	926.94	463.60	49.	27.	0.014	114.69	1.500s
TL-208	1023.43	511.82	55.	77.	0.038	60.02	1.182
TL-208	1167.80	583.99	58.	123.	0.061	45.58	1.283
BI-214	1221.05	610.60	44.	116.	0.058	41.14	1.111
AC-228	1941.53	970.66	19.	27.	0.013	90.28	1.718s
K-40	2927.87	1463.48	17.	444.	0.222	14.76	2.042

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	Peak MDA Value pCi/gm	COMMENTS
BE-7		8.8214E-02					
			477.56	8.821E-02	%(	2.912E-01 8.57E-02	G
K-40		1.0646E+01					
			1460.75	1.065E+01	(P	5.249E-01 5.24E-01	G
MN-54		-5.9434E-04					
			834.81	-5.943E-04	&(P	3.659E-02 9.76E-03	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CO-57	1.1552E-04						
		122.07	1.155E-04	%(	3.763E-02	1.10E-02	G K
		136.43	0.000E+00	&	3.579E-01	1.06E-01	G
CO-60	-1.3458E-02						
		1332.51	-1.346E-02	%(P	6.053E-02	1.73E-02	G K
		1173.23	-8.184E-04	%	5.664E-02	1.55E-02	G K
Sr-85	1.6710E-03						
		514.00	1.671E-03	&(	4.323E-02	1.23E-02	G
Kr-85	3.7981E+01						
		513.99	3.798E+01	&(	9.824E+02	2.80E+02	G
Y-88	-2.7858E-05						
		1836.01	-2.786E-05	&(P	2.342E-02	3.94E-03	G K
		898.02	5.346E-03	% P	4.433E-02	1.23E-02	G
NB-94	0.0000E+00						
		871.10	0.000E+00	&(	3.880E-02	1.04E-02	G K
		702.50	2.446E-03	%	3.153E-02	8.65E-03	G K
Ag-108M	-4.3897E-03						
		722.95	-4.390E-03	%(	4.608E-02	1.30E-02	G K
		614.37	-3.356E-02	% P	6.493E-02	1.97E-02	G
		433.93	-7.764E-03	%	4.197E-02	1.23E-02	G
CD-109	4.3891E-01						
		88.04	4.389E-01	%(P	1.782E+00	5.35E-01	G
SN-113	2.8566E-02						
		391.71	2.857E-02	?(	2.906E-02	9.79E-03	G K
		255.04	2.672E-01	&	1.636E+00	4.83E-01	G
SB-125	8.0815E-02						
		427.95	2.337E-02	%(P	1.086E-01	3.15E-02	G K
		600.77	-5.307E-03	% P	1.698E-01	4.64E-02	G
		636.15	1.343E-01	% P	2.705E-01	8.25E-02	G
		463.51	2.509E-01	*(P	3.213E-01	1.01E-01	G
		176.29	1.088E-02	& P	5.308E-01	1.56E-01	G
I-131	-7.7029E-03						
		364.48	-7.703E-03	&(	4.475E-02	1.31E-02	G K
		636.97	2.111E-01	&	5.204E-01	1.56E-01	G
		284.29	2.253E-01	%	6.103E-01	1.83E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CS-134	6.9717E-03						
		604.66	6.972E-03	&(	3.571E-02	1.03E-02	G K
		795.76	2.060E-02	%	5.944E-02	1.76E-02	G
		569.29	4.120E-02	%	2.474E-01	7.13E-02	G
		801.84	-1.264E-01	% P	5.837E-01	1.69E-01	G
CS-137	1.0017E-02						
		661.62	1.002E-02	%(	5.275E-02	1.53E-02	G
CE-139	-1.3596E-03						
		165.85	-1.360E-03	%(P	4.061E-02	1.19E-02	G
EU-152	1.8169E-03						
		121.78	1.817E-03	%(P	1.188E-01	3.49E-02	G K
		344.30	1.098E-03	%	8.894E-02	2.50E-02	G
		1408.08	2.131E-02	%	1.971E-01	5.26E-02	G
		964.00	1.132E-02	% P	3.159E-01	8.63E-02	G
		1112.07	1.557E-01	%	4.193E-01	1.25E-01	G
		778.90	7.374E-02	% P	2.847E-01	8.22E-02	G
EU-154	4.2356E-03						
		123.10	4.236E-03	%(P	9.025E-02	2.67E-02	G K
		1274.80	7.571E-02	%	1.721E-01	5.19E-02	G
		723.30	-3.538E-02	% P	2.223E-01	6.34E-02	G
		1004.80	9.460E-02	%	2.302E-01	6.89E-02	G
EU-155	-3.2319E-02						
		86.45	-3.232E-02	&(P	1.898E-01	5.64E-02	G K
		105.31	5.298E-03	%	1.839E-01	5.42E-02	G
HG-203	-1.0374E-04						
		279.17	-1.037E-04	&(P	4.293E-02	1.25E-02	G K
		72.87	-2.273E-01	&	1.773E+00	5.30E-01	G
		70.83	3.046E-03	%	3.013E+00	8.93E-01	G
		82.50	4.818E-01	%	3.371E+00	1.01E+00	G
TL-208	1.6263E-01						
		583.14	1.626E-01	(P	5.084E-02	2.48E-02	G
		510.72	3.431E-01	+	1.664E-01	6.88E-02	G
PB-212	3.7543E-01						
		238.63	3.647E-01	(	8.695E-02	3.26E-02	G K
							Energy duplication
		77.11	4.019E-01	(	5.257E-01	1.61E-01	G
		74.81	4.287E-01	& P	1.041E+00	3.15E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
PB-214	3.1605E-01						
		351.99	3.040E-01	@(P	8.504E-02	3.40E-02	G K
		295.22	3.394E-01	@(	1.554E-01	5.50E-02	G
							Energy duplication
		77.11	6.573E-01	+	8.597E-01	2.64E-01	G
		241.92	2.589E-01	%	5.101E-01	1.55E-01	G
BI-212	2.6585E-01						
		727.17	2.659E-01	%(	3.473E-01	1.11E-01	G K
		1620.56	-3.421E-02	& P	7.513E-01	1.02E-01	G
		785.42	1.037E+00	& P	1.819E+00	5.64E-01	G
BI-214	2.9912E-01						
		609.32	2.991E-01	(	8.686E-02	4.11E-02	G K
		1764.51	-1.644E-03	% P	3.181E-01	8.05E-02	G
		1120.28	-4.042E-02	%	4.827E-01	1.37E-01	G
RA-224	5.7795E-01						
		241.00	5.780E-01	&(P	1.025E+00	3.12E-01	G
RA-226	8.1708E-01						
		185.99	8.171E-01	@(P	1.064E+00	3.28E-01	G
AC-228	1.3976E-01						
		911.07	-2.805E-02	%(P	1.721E-01	4.89E-02	G K
		968.90	2.750E-01	&(P	2.370E-01	8.29E-02	G
		338.40	3.483E-01	(	2.741E-01	9.01E-02	G
TH-227	-1.9648E-01						
		236.00	-1.965E-01	%(P	4.147E-01	1.26E-01	G K
		256.25	3.656E-03	&	5.111E-01	1.49E-01	G
PA-234	1.1591E-02						
		98.44	1.159E-02	%(	2.019E-01	5.99E-02	G K
		946.00	6.062E-02	&	2.309E-01	6.69E-02	G
		131.28	1.013E-01	%	1.695E-01	5.18E-02	G
		94.67	-1.248E-01	%	3.898E-01	1.17E-01	G
		883.24	-4.804E-02	&	4.696E-01	1.34E-01	G
		926.70	-1.882E-02	%	3.745E-01	1.02E-01	G
		569.26	6.186E-02	%	3.659E-01	1.05E-01	G
TH-234	1.2460E+00						
		63.29	1.246E+00	%(P	3.808E+00	1.15E+00	G K
		92.80	8.404E-01	%	2.014E+00	6.09E-01	G
		92.38	1.824E-01	% P	2.237E+00	6.65E-01	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments

AM-241      -1.6519E-01
                            59.54-1.652E-01 %(  6.120E-01 1.84E-01 G
   ( - This peak used in the nuclide activity average.

   * - Peak is too wide, but only one peak in library.
   ! - Peak is part of a multiplet and this area went
       negative during deconvolution.
   ? - Peak is too narrow.
   @ - Peak is too wide at FW25M, but ok at FWHM.
   % - Peak fails sensitivity test.
   $ - Peak identified, but first peak of this nuclide
       failed one or more qualification tests.
   + - Peak activity higher than counting uncertainty range.
   - - Peak activity lower than counting uncertainty range.
   = - Peak outside analysis energy range.
   & - Calculated peak centroid is not close enough to the
       library energy centroid for positive identification.
   P - Peakbackground subtraction
   } - Peak is too close to another for the activity
       to be found directly.

   Nuclide Codes:                      Peak Codes:
   T - Thermal Neutron Activation      G - Gamma Ray
   F - Fast Neutron Activation         X - X-Ray
   I - Fission Product                 P - Positron Decay
   N - Naturally Occurring Isotope     S - Single-Escape
   P - Photon Reaction                 D - Double-Escape
   C - Charged Particle Reaction       K - Key Line
   M - No MDA Calculation              A - Not in Average
   R - Coincidence Corrected           C - Coincidence Peak
   H - Halflife limit exceeded

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
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***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	8.6550E-02	8.8214E-02	2.5699E-01	2.5703E-01	2.857E-01
K-40		1.0646E+01	1.0646E+01	1.5718E+00	1.6816E+00	5.249E-01
MN-54	#A	-5.9240E-04	-5.9434E-04	1.0739E-01	1.0739E-01	3.647E-02
CO-57	#B	1.1509E-04	1.1552E-04	3.3116E-02	3.3116E-02	3.749E-02
CO-60	#B	-1.3451E-02	-1.3458E-02	5.3422E-02	5.3428E-02	6.050E-02
Sr-85	#A	1.6449E-03	1.6710E-03	3.7018E-02	3.7018E-02	4.256E-02
Kr-85	#A	3.7981E+01	3.7981E+01	8.4129E+02	8.4129E+02	9.824E+02
Y-88	#B	-2.7594E-05	-2.7858E-05	8.2202E-02	8.2202E-02	2.320E-02
NB-94	#B	0.0000E+00	0.0000E+00	3.1257E-02	3.1257E-02	3.880E-02
Ag-108M	#B	-4.3896E-03	-4.3897E-03	3.8946E-02	3.8946E-02	4.608E-02
CD-109	#A	4.3793E-01	4.3891E-01	1.6040E+00	1.6041E+00	1.778E+00

SN-113	#A	2.8314E-02	2.8566E-02	2.9366E-02	2.9410E-02	2.880E-02
SB-125	#B	8.0734E-02	8.0815E-02	9.7908E-02	9.8013E-02	1.085E-01
I-131	#B	-6.7874E-03	-7.7029E-03	3.9164E-02	3.9166E-02	3.943E-02
CS-134	#B	6.9623E-03	6.9717E-03	3.0780E-02	3.0782E-02	3.566E-02
CS-137	#A	1.0017E-02	1.0017E-02	4.5802E-02	4.5805E-02	5.275E-02
CE-139	#A	-1.3496E-03	-1.3596E-03	4.9410E-02	4.9410E-02	4.031E-02
EU-152	#B	1.8165E-03	1.8169E-03	1.0481E-01	1.0481E-01	1.188E-01
EU-154	#B	4.2342E-03	4.2356E-03	7.9964E-02	7.9964E-02	9.022E-02
EU-155	#B	-3.2301E-02	-3.2319E-02	2.5491E-01	2.5492E-01	1.897E-01
HG-203	#B	-1.0150E-04	-1.0374E-04	1.6108E-01	1.6108E-01	4.200E-02
TL-208		1.6263E-01	1.6263E-01	7.4371E-02	7.4929E-02	
PB-212	#	3.7543E-01	3.7543E-01	1.0055E-01	1.0273E-01	8.695E-02
PB-214	#	3.1605E-01	3.1605E-01	9.3415E-02	9.5084E-02	8.504E-02
BI-212	#B	2.6585E-01	2.6585E-01	3.3274E-01	3.3308E-01	3.473E-01
BI-214		2.9912E-01	2.9912E-01	1.2306E-01	1.2420E-01	
RA-224	#A	5.7795E-01	5.7795E-01	9.3691E-01	9.3747E-01	1.025E+00
RA-226	#A	8.1708E-01	8.1708E-01	9.8285E-01	9.8392E-01	1.064E+00
AC-228	#B	1.3976E-01	1.3976E-01	1.0843E-01	1.0871E-01	1.721E-01
TH-227	#B	-1.9648E-01	-1.9648E-01	3.8169E-01	3.8185E-01	4.147E-01
PA-234	#B	1.1591E-02	1.1591E-02	1.7976E-01	1.7977E-01	2.019E-01
TH-234	#B	1.2460E+00	1.2460E+00	3.4371E+00	3.4378E+00	3.808E+00
AM-241	#A	-1.6519E-01	-1.6519E-01	5.5130E-01	5.5138E-01	6.120E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (295.7 to 1999.0 keV) 1.1108016E+01 pCi/gm
Total Decayed Activity (295.7 to 1999.0 keV) 1.1108016E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
DAT

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 102F_25JUL2006_1920.An1

Sample description
FSS-OOL-05-05-013-F

Spectrum Filename: C:\GammaVision\Spectra\102F_25JUL2006_1920.An1

Acquisition information
Start time: 25-Jul-2006 19:20:24
Live time: 2000
Real time: 2020
Dead time: 0.98 %
Detector ID: 3

Detector system
Det 102 - DSPP-468

Calibration
Filename: D2_1LSa.Clb
DET 102 1 Liter Sand Geometry

Energy Calibration
Created: 15-Jan-2005 03:09:29
Zero offset: 0.220 keV
Gain: 0.500 keV/channel
Quadratic: -6.435E-08 keV/channel^2

Efficiency Calibration
Created: 15-Jan-2005 06:48:10
Type: Polynomial
Uncertainty: 0.497 %
Coefficients: -0.294180 -5.980622 0.744607
-0.096737 0.005214 -0.000120

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.22keV)
Stop channel: 4000 (1999.02keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 1.9270E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.9270E+03) =
5.1894E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	24-Jul-2006 08:32:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	102_150K_28APR05.Pbc 01-May-2005 05:27:47
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 16 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.6935

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
74.84	116.	37.79	1.50	8.847E-03				
74.84	116.	37.79	1.50	8.847E-03	74.81	9.600	PBC<MDA	PB212
77.24	211.	21.33	1.50	9.541E-03	77.11	10.700	1.447E+00	PB214
					77.11	17.500	8.846E-01	PB212
77.24	211.	21.33	1.50	9.541E-03	77.11	10.700	1.447E+00	PB214
					77.11	17.500	8.846E-01	PB212
128.51	91.	40.17	0.78	1.713E-02				
209.76	106.	28.43	1.23	1.517E-02				
239.12	631.	4.81	1.22	1.379E-02	238.63	43.100	7.433E-01	PB212
242.04	101.	27.13	1.22	1.365E-02	241.00	3.900	PBC<MDA	RA224
					241.92	7.470	6.936E-01	PB214
270.19	95.	25.81	1.99	1.243E-02				
295.62	157.	16.02	1.85	1.145E-02	295.22	19.200	5.008E-01	PB214
338.88	173.	14.99	1.12	1.005E-02	338.40	12.010	1.006E+00	AC228
352.61	276.	10.82	1.47	9.662E-03	351.99	37.100	5.390E-01	PB214
463.44	53.	24.79	1.74	7.366E-03				
463.44	53.	24.79	1.74	7.366E-03	463.51	10.000	4.904E-01	SB125
511.45	110.	16.42	1.60	6.686E-03	510.72	22.500	5.107E-01	TL208
584.24	180.	10.27	1.21	5.879E-03	583.14	86.000	2.479E-01	TL208
610.28	130.	13.14	1.24	5.641E-03	609.32	46.090	3.501E-01	BI214
662.63	43.	37.74	1.01	5.222E-03	661.62	84.620	6.815E-02	CS137
729.12	52.	21.51	1.19	4.782E-03				
912.78	124.	13.29	1.76	3.916E-03				
970.06	90.	17.71	1.89	3.714E-03	968.90	17.460	9.773E-01	AC228
1463.42	504.	4.58	1.57	2.617E-03				

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
256.61	128.51	474.	115.	0.058	84.76	0.777	AC-228	sM
419.13	209.76	307.	106.	0.053	85.28	1.235	NP-239	sM
477.88	239.04	146.	631.	0.315	14.44	1.215	PB-212	D

Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM	Suspected	
483.71	241.96	324.	101.	0.050	81.40	1.217	PB-214	D
540.01	270.19	189.	95.	0.048	77.42	1.986	AC-228	sM
1325.15	662.63	76.	43.	0.022	113.23	1.008	CS-137	l
1458.20	729.12	26.	57.	0.029	54.93	1.193	J-132	M
1825.70	912.78	44.	123.	0.061	35.50	1.763	AC-228	M
1940.33	970.06	46.	92.	0.046	44.40	1.894	AC-228	M
2927.74	1463.42	7.	504.	0.252	13.54	1.575	K-40	M

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.
M - Peak is close to a library peak.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-212	149.25	74.84	959.	116.	0.058	113.38	1.500
PB-214	153.80	77.11	903.	211.	0.105	63.98	1.500D
PB-212	153.80	77.11	903.	211.	0.105	63.98	1.500D
PB-212	477.85	239.11	404.	583.	0.291	19.20	1.500
PB-214	591.19	295.77	192.	140.	0.070	48.95	1.500s
AC-228	677.67	339.00	136.	133.	0.066	45.50	1.500
PB-214	704.90	352.61	136.	239.	0.119	28.32	1.500
SB-125	927.53	463.89	58.	42.	0.021	86.63	1.500s
TL-208	1022.67	511.45	69.	110.	0.055	49.27	1.597s
TL-208	1168.31	584.24	60.	179.	0.090	30.82	1.214
BI-214	1220.41	610.28	54.	130.	0.065	39.43	1.244
Ag-108M	1224.04	612.09	112.	-42.	-0.021	116.52	1.499s

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	Peak MDA Value pCi/gm	COMMENTS
BE-7		7.3357E-02					
			477.56	7.336E-02	%(	4.404E-01 1.28E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
K-40	-3.7790E-03						
		1460.75	-3.779E-03	%(P	1.126E+00	3.21E-01	G
MN-54	-8.9092E-03						
		834.81	-8.909E-03	%(P	5.544E-02	1.59E-02	G
CO-57	-3.4006E-03						
		122.07	-3.401E-03	&(	6.004E-02	1.79E-02	G K
		136.43	1.164E-01	%	4.272E-01	1.28E-01	G
CO-60	-3.4451E-04						
		1332.51	-3.445E-04	%(P	5.330E-02	1.41E-02	G K
		1173.23	-6.187E-03	%	7.099E-02	2.01E-02	G K
Sr-85	-1.2803E-02						
		514.00	-1.280E-02	%(	6.017E-02	1.78E-02	G
Kr-85	-2.9089E+02						
		513.99	-2.909E+02	%(	1.368E+03	4.04E+02	G
Y-88	-2.1766E-05						
		1836.01	-2.177E-05	%(P	5.581E-02	1.42E-02	G K
		898.02	3.274E-04	% P	5.440E-02	1.49E-02	G
NB-94	3.2475E-04						
		871.10	3.248E-04	&(	5.612E-02	1.56E-02	G K
		702.50	-1.230E-02	%	5.306E-02	1.55E-02	G K
Ag-108M	-6.7857E-04						
		722.95	-6.786E-04	&(	5.209E-02	1.45E-02	G K
		614.37	-5.827E-02	+ P	7.193E-02	2.25E-02	G
		433.93	-1.095E-02	%	4.926E-02	1.45E-02	G
CD-109	7.1589E-01						
		88.04	7.159E-01	%(P	2.131E+00	6.42E-01	G
SN-113	9.8580E-03						
		391.71	9.858E-03	%(	5.475E-02	1.60E-02	G K
		255.04	2.258E-01	&	2.123E+00	6.28E-01	G
SB-125	9.5610E-02						
		427.95	-6.142E-03	&(P	1.566E-01	4.50E-02	G K
		600.77	8.361E-03	% P	2.713E-01	7.72E-02	G
		636.15	3.963E-02	& P	4.002E-01	1.14E-01	G
		463.51	3.968E-01	*(P	3.632E-01	1.19E-01	G
		176.29	-1.137E-01	& P	7.096E-01	2.11E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
I-131	2.9988E-03						
		364.48	2.999E-03	&(	5.317E-02	1.54E-02	G K
		636.97	-2.812E-02	%	7.088E-01	2.00E-01	G
		284.29	-1.176E-02	&	7.964E-01	2.33E-01	G
CS-134	3.9934E-04						
		604.66	3.993E-04	&(	4.765E-02	1.34E-02	G K
		795.76	3.718E-02	%	5.395E-02	1.70E-02	G
		569.29	8.545E-02	%	2.826E-01	8.35E-02	G
		801.84	-8.055E-02	% P	4.774E-01	1.35E-01	G
CS-137	3.7355E-02						
		661.62	3.736E-02	%(	5.519E-02	1.73E-02	G
CE-139	5.9775E-03						
		165.85	5.978E-03	%(P	5.114E-02	1.52E-02	G
EU-152	-1.6740E-02						
		121.78	-1.674E-02	&(P	1.707E-01	5.08E-02	G K
		344.30	-2.054E-02	%	1.604E-01	4.71E-02	G
		1408.08	0.000E+00	%	9.013E-02	1.22E-02	G
		964.00	-1.992E-02	& P	4.560E-01	1.28E-01	G
		1112.07	2.099E-01	%	4.544E-01	1.38E-01	G
		778.90	-1.691E-02	% P	3.815E-01	1.07E-01	G
EU-154	-1.8269E-02						
		123.10	-1.827E-02	%(P	1.089E-01	3.25E-02	G K
		1274.80	5.871E-02	%	1.938E-01	5.69E-02	G
		723.30	-1.658E-03	& P	2.666E-01	7.47E-02	G
		1004.80	-5.621E-02	%	3.533E-01	1.01E-01	G
EU-155	4.0896E-02						
		86.45	4.090E-02	%(P	2.657E-01	7.95E-02	G K
		105.31	4.475E-03	%	2.600E-01	7.72E-02	G
HG-203	1.9607E-02						
		279.17	1.961E-02	%(P	4.557E-02	1.38E-02	G K
		72.87	-6.162E-01	&	2.059E+00	6.21E-01	G
		70.83	-2.519E-04	%	3.829E+00	1.14E+00	G
		82.50	1.111E-01	%	3.384E+00	1.00E+00	G
TL-208	2.4794E-01						
		583.14	2.479E-01	(P	5.369E-02	2.56E-02	G
		510.72	5.107E-01	+	1.932E-01	8.40E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
PB-212	6.8669E-01						
		238.63	6.867E-01	(	1.136E-01	4.40E-02	G K
							Energy duplication
		77.11	8.846E-01	+	5.997E-01	1.89E-01	G
		74.81	9.596E-01	& P	1.214E+00	3.72E-01	G
PB-214	4.5961E-01						
		351.99	4.662E-01	(P	1.112E-01	4.41E-02	G K
		295.22	4.468E-01	(	2.142E-01	7.29E-02	G
							Energy duplication
		77.11	1.447E+00	+	9.808E-01	3.09E-01	G
		241.92	4.578E-01	%	7.236E-01	2.21E-01	G
BI-212	-7.8927E-02						
		727.17	-7.893E-02	%(	4.575E-01	1.32E-01	G K
		1620.56	-3.570E-02	% P	1.746E+00	4.34E-01	G
		785.42	1.035E+00	% P	2.370E+00	7.14E-01	G
BI-214	3.5013E-01						
		609.32	3.501E-01	(	9.953E-02	4.61E-02	G K
		1764.51	-1.716E-03	% P	5.248E-01	1.43E-01	G
		1120.28	-1.206E-01	&	5.550E-01	1.62E-01	G
RA-224	8.3641E-01						
		241.00	8.364E-01	&(P	1.384E+00	4.22E-01	G
RA-226	7.2439E-01						
		185.99	7.244E-01	%(P	1.366E+00	4.15E-01	G
AC-228	2.2863E-01						
		911.07	4.731E-03	%(P	2.187E-01	6.15E-02	G K
		968.90	-1.355E-02	% P	3.561E-01	9.99E-02	G
		338.40	7.693E-01	(	3.309E-01	1.17E-01	G
TH-227	-2.9487E-01						
		236.00	-2.949E-01	%(P	5.316E-01	1.62E-01	G K
		256.25	1.112E-01	&	6.002E-01	1.78E-01	G
PA-234	-5.0684E-02						
		98.44	-5.068E-02	&(	2.476E-01	7.42E-02	G K
		946.00	-2.137E-02	%	2.747E-01	7.71E-02	G
		131.28	-8.828E-02	%	2.571E-01	7.75E-02	G
		94.67	-1.172E-01	%	4.109E-01	1.24E-01	G
		883.24	-3.951E-02	%	4.314E-01	1.21E-01	G
		926.70	-1.864E-02	%	4.371E-01	1.20E-01	G
		569.26	1.266E-01	%	4.186E-01	1.24E-01	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments

TH-234       1.8907E+00
                           63.29 1.891E+00 %(P 4.704E+00 1.42E+00 G K
                           92.80 9.401E-01 %   2.479E+00 7.49E-01 G
                           92.38-8.994E-02 & P 3.033E+00 9.04E-01 G

AM-241      -1.0776E-01
                           59.54-1.078E-01 %(  6.843E-01 2.05E-01 G
   ( - This peak used in the nuclide activity average.

   * - Peak is too wide, but only one peak in library.
   ! - Peak is part of a multiplet and this area went
       negative during deconvolution.
   ? - Peak is too narrow.
   @ - Peak is too wide at FW25M, but ok at FWHM.
   % - Peak fails sensitivity test.
   $ - Peak identified, but first peak of this nuclide
       failed one or more qualification tests.
   + - Peak activity higher than counting uncertainty range.
   - - Peak activity lower than counting uncertainty range.
   = - Peak outside analysis energy range.
   & - Calculated peak centroid is not close enough to the
       library energy centroid for positive identification.
   P - Peakbackground subtraction
   } - Peak is too close to another for the activity
       to be found directly.

   Nuclide Codes:                      Peak Codes:
   T - Thermal Neutron Activation      G - Gamma Ray
   F - Fast Neutron Activation         X - X-Ray
   I - Fission Product                 P - Positron Decay
   N - Naturally Occurring Isotope     S - Single-Escape
   P - Photon Reaction                 D - Double-Escape
   C - Charged Particle Reaction       K - Key Line
   M - No MDA Calculation              A - Not in Average
   R - Coincidence Corrected           C - Coincidence Peak
   H - Halflife limit exceeded

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
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***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	7.1989E-02	7.3357E-02	3.8546E-01	3.8548E-01	4.322E-01
K-40	#A	-3.7790E-03	-3.7790E-03	2.9090E-01	2.9090E-01	1.126E+00
MN-54	#A	-8.8805E-03	-8.9092E-03	5.1571E-02	5.1574E-02	5.526E-02
CO-57	#B	-3.3880E-03	-3.4006E-03	5.3599E-02	5.3599E-02	5.982E-02
CO-60	#B	-3.4433E-04	-3.4451E-04	1.4976E-01	1.4976E-01	5.327E-02
Sr-85	#A	-1.2606E-02	-1.2803E-02	5.3299E-02	5.3304E-02	5.924E-02

Kr-85	#A	-2.9089E+02	-2.9089E+02	1.2115E+03	1.2116E+03	1.368E+03
Y-88	#B	-2.1561E-05	-2.1766E-05	5.5934E-04	5.5935E-04	5.529E-02
NB-94	#B	3.2475E-04	3.2475E-04	4.6905E-02	4.6905E-02	5.612E-02
Ag-108M	#B	-6.7855E-04	-6.7857E-04	4.3567E-02	4.3567E-02	5.209E-02
CD-109	#A	7.1431E-01	7.1589E-01	1.9275E+00	1.9279E+00	2.126E+00
SN-113	#B	9.7722E-03	9.8580E-03	4.7908E-02	4.7911E-02	5.427E-02
SB-125	#B	9.5515E-02	9.5610E-02	8.5906E-02	8.6073E-02	1.565E-01
I-131	#B	2.6463E-03	2.9988E-03	4.6136E-02	4.6137E-02	4.692E-02
CS-134	#B	3.9881E-04	3.9934E-04	4.0324E-02	4.0324E-02	4.759E-02
CS-137	#A	3.7352E-02	3.7355E-02	5.1771E-02	5.1814E-02	5.519E-02
CE-139	#A	5.9340E-03	5.9775E-03	4.5571E-02	4.5573E-02	5.076E-02
EU-152	#B	-1.6736E-02	-1.6740E-02	1.7703E-01	1.7704E-01	1.706E-01
EU-154	#B	-1.8264E-02	-1.8269E-02	9.9773E-02	9.9778E-02	1.089E-01
EU-155	#B	4.0874E-02	4.0896E-02	2.3860E-01	2.3862E-01	2.655E-01
HG-203	#B	1.9189E-02	1.9607E-02	4.1277E-02	4.1292E-02	4.460E-02
TL-208		2.4794E-01	2.4794E-01	7.6600E-02	7.7854E-02	
PB-212	#	6.8669E-01	6.8669E-01	1.3188E-01	1.3739E-01	1.136E-01
PB-214	#	4.5961E-01	4.5961E-01	1.3000E-01	1.3254E-01	1.112E-01
BI-212	#B	-7.8927E-02	-7.8927E-02	3.9718E-01	3.9720E-01	4.575E-01
BI-214		3.5013E-01	3.5013E-01	1.3807E-01	1.3946E-01	
RA-224	#A	8.3641E-01	8.3641E-01	1.2667E+00	1.2676E+00	1.384E+00
RA-226	#A	7.2439E-01	7.2439E-01	1.2437E+00	1.2444E+00	1.366E+00
AC-228	F	2.2863E-01	2.2863E-01	1.0403E-01	1.0482E-01	2.187E-01
TH-227	#B	-2.9487E-01	-2.9487E-01	4.8944E-01	4.8972E-01	5.316E-01
PA-234	#B	-5.0684E-02	-5.0684E-02	2.2260E-01	2.2261E-01	2.476E-01
TH-234	#B	1.8907E+00	1.8907E+00	4.2650E+00	4.2663E+00	4.704E+00
AM-241	#A	-1.0776E-01	-1.0776E-01	6.1370E-01	6.1372E-01	6.843E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (270.2 to 1999.0 keV) 8.2670611E-01 pCi/gm
Total Decayed Activity (270.2 to 1999.0 keV) 8.2670611E-01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
DAT

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 102F_25JUL2006_1957.An1

Sample description
FSS-OOL-05-05-013-F-RC

Spectrum Filename: C:\GammaVision\Spectra\102F_25JUL2006_1957.An1

Acquisition information
Start time: 25-Jul-2006 19:57:58
Live time: 2000
Real time: 2020
Dead time: 1.00 %
Detector ID: 3

Detector system
Det 102 - DSPP-468

Calibration
Filename: D2_1LSa.Clb
DET 102 1 Liter Sand Geometry

Energy Calibration
Created: 15-Jan-2005 03:09:29
Zero offset: 0.220 keV
Gain: 0.500 keV/channel
Quadratic: -6.435E-08 keV/channel^2

Efficiency Calibration
Created: 15-Jan-2005 06:48:10
Type: Polynomial
Uncertainty: 0.497 %
Coefficients: -0.294180 -5.980622 0.744607
-0.096737 0.005214 -0.000120

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.22keV)
Stop channel: 4000 (1999.02keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 1.9270E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.9270E+03) =
5.1894E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	24-Jul-2006 08:32:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	102_150K_28APR05.Pbc 01-May-2005 05:27:47
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 13 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.6750

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
75.11	158.	28.35	1.50	8.847E-03				
75.11	158.	28.35	1.50	8.847E-03	74.81	9.600	1.304E+00	PB212
76.95	160.	27.99	1.50	9.541E-03	77.11	10.700	1.098E+00	PB214
					77.11	17.500	6.715E-01	PB212
76.95	160.	27.99	1.50	9.541E-03	77.11	10.700	1.098E+00	PB214
					77.11	17.500	6.715E-01	PB212
93.46	96.	36.91	1.12	1.346E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	1.690E+00	TH234
186.35	63.	34.49	1.14	1.625E-02	185.99	3.280	PBC<MDA	RA226
239.12	675.	4.60	1.22	1.379E-02	238.63	43.100	7.956E-01	PB212
242.19	87.	23.62	1.22	1.365E-02	241.00	3.900	PBC<MDA	RA224
					241.92	7.470	5.999E-01	PB214
271.00	92.	26.67	1.42	1.240E-02				
295.74	151.	18.98	1.00	1.145E-02	295.22	19.200	4.817E-01	PB214
328.56	85.	27.16	1.14	1.035E-02				
338.97	131.	16.24	1.29	1.004E-02	338.40	12.010	7.592E-01	AC228
352.64	226.	11.61	1.01	9.661E-03	351.99	37.100	4.404E-01	PB214
463.97	74.	28.95	1.26	7.357E-03	463.51	10.000	6.906E-01	SB125
511.58	101.	23.77	1.24	6.684E-03	510.72	22.500	4.721E-01	TL208
584.42	195.	10.54	1.50	5.878E-03	583.14	86.000	2.694E-01	TL208
610.35	170.	9.93	1.49	5.640E-03	609.32	46.090	4.592E-01	BI214
728.01	45.	28.13	1.03	4.789E-03	727.17	11.800	5.603E-01	BI212
796.27	29.	36.25	1.60	4.420E-03	795.76	85.400	PBC<MDA	CS134
862.66	31.	37.42	0.56	4.114E-03				
912.94	160.	11.85	1.81	3.915E-03				
970.56	116.	15.17	1.69	3.712E-03				
1463.46	547.	4.38	1.95	2.617E-03	1460.75	10.700	1.368E+01	K40

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
477.87	239.03	144.	675.	0.338	13.79	1.215	PB-212	D
484.01	242.10	169.	87.	0.044	70.86	1.217	PB-214	D
541.63	271.00	195.	92.	0.046	71.76	1.418	AC-228	sM
656.80	328.56	145.	85.	0.043	68.26	1.137	RH-106M	M
927.70	463.97	110.	74.	0.037	86.86	1.258	SB-125	l
1826.03	912.94	45.	158.	0.079	29.91	1.814	AC-228	M
1941.32	970.56	41.	124.	0.062	34.66	1.690	AC-228	M

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.
M - Peak is close to a library peak.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-212	149.80	75.11	964.	158.	0.079	85.04	1.500s
PB-214	153.80	77.11	922.	160.	0.080	83.98	1.500D
PB-212	153.80	77.11	922.	160.	0.080	83.98	1.500D
TH-234	186.12	93.27	752.	122.	0.061	97.96	1.500
TH-234	186.08	93.25	776.	124.	0.062	98.72	1.500
RA-226	372.13	186.26	414.	75.	0.038	113.01	1.500
PB-212	477.93	239.15	388.	555.	0.278	19.71	1.500
PB-214	591.36	295.85	202.	144.	0.072	48.82	1.500
AC-228	677.82	339.07	127.	127.	0.064	45.97	1.500
PB-214	705.01	352.66	128.	197.	0.098	32.34	1.500
TL-208	1022.94	511.58	130.	101.	0.051	71.31	1.237s
TL-208	1168.67	584.42	69.	195.	0.097	31.63	1.501
BI-214	1220.56	610.35	46.	170.	0.085	29.80	1.491
BI-212	1455.98	728.01	45.	45.	0.023	84.39	1.030s
CS-134	1592.55	796.27	41.	29.	0.015	108.75	1.601s
K-40	2927.89	1463.49	10.	527.	0.264	13.31	2.042

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	MDA Value pCi/gm	COMMENTS
BE-7		8.0355E-02					
			477.56	8.035E-02	%(	4.080E-01 1.19E-01	G
K-40		1.3180E+01					
			1460.75	1.318E+01	(P	4.362E-01 5.85E-01	G
MN-54		1.4218E-02					
			834.81	1.422E-02	&(P	5.247E-02 1.53E-02	G
CO-57		4.0611E-03					
			122.07	4.061E-03	%(	5.674E-02 1.69E-02	G K
			136.43	-1.597E-01	%	4.720E-01 1.42E-01	G
CO-60		2.3229E-03					
			1332.51	2.323E-03	%(P	6.335E-02 1.73E-02	G K
			1173.23	2.069E-03	&	7.155E-02 2.00E-02	G K
Sr-85		-1.0386E-02					
			514.00	-1.039E-02	&(	6.421E-02 1.89E-02	G
Kr-85		-2.3601E+02					
			513.99	-2.360E+02	&(	1.459E+03 4.29E+02	G
Y-88		-2.1769E-05					
			1836.01	-2.177E-05	%(P	5.582E-02 1.42E-02	G K
			898.02	-1.837E-03	& P	4.531E-02 1.21E-02	G
NB-94		-4.5741E-03					
			871.10	-4.574E-03	%(	5.495E-02 1.55E-02	G K
			702.50	-8.534E-03	%	5.192E-02 1.50E-02	G K
Ag-108M		0.0000E+00					
			722.95	0.000E+00	%(	7.120E-02 2.03E-02	G K
			614.37	-4.708E-02	% P	7.309E-02 2.25E-02	G
			433.93	-2.919E-03	&	4.796E-02 1.38E-02	G
CD-109		2.3503E-03					
			88.04	2.350E-03	%(P	2.102E+00 6.25E-01	G
SN-113		-1.4927E-02					
			391.71	-1.493E-02	%(	6.733E-02 1.99E-02	G K
			255.04	-3.552E-01	%	1.863E+00 5.52E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	1.4204E-02						
		427.95	1.420E-02	&(P	1.272E-01	3.66E-02	G K
		600.77	-5.265E-02	& P	2.577E-01	7.50E-02	G
		636.15	8.631E-02	% P	3.911E-01	1.14E-01	G
		463.51	3.288E-01	% P	4.853E-01	1.50E-01	G
		176.29	8.908E-02	& P	5.865E-01	1.74E-01	G
I-131	-7.1870E-03						
		364.48	-7.187E-03	%(	5.642E-02	1.65E-02	G K
		636.97	1.367E-01	%	6.987E-01	2.02E-01	G
		284.29	1.270E-02	%	7.671E-01	2.24E-01	G
CS-134	2.5174E-02						
		604.66	-4.965E-05	&(	4.502E-02	1.26E-02	G K
		795.76	5.400E-02	*(	6.044E-02	1.96E-02	G
		569.29	8.038E-03	&	3.700E-01	1.06E-01	G
		801.84	-6.113E-03	% P	5.246E-01	1.44E-01	G
CS-137	7.7576E-03						
		661.62	7.758E-03	%(	4.858E-02	1.39E-02	G
CE-139	1.1145E-02						
		165.85	1.115E-02	&(P	5.254E-02	1.57E-02	G
EU-152	8.3789E-03						
		121.78	8.379E-03	%(P	1.705E-01	5.07E-02	G K
		344.30	-4.023E-02	%	1.542E-01	4.58E-02	G
		1408.08	-3.965E-02	%	2.824E-01	7.88E-02	G
		964.00	8.888E-04	% P	3.864E-01	1.07E-01	G
		1112.07	-5.016E-03	%	5.030E-01	1.40E-01	G
		778.90	6.643E-03	% P	4.249E-01	1.19E-01	G
EU-154	3.4746E-03						
		123.10	3.475E-03	%(P	1.184E-01	3.51E-02	G K
		1274.80	-2.000E-02	&	2.104E-01	5.95E-02	G
		723.30	-1.899E-02	% P	2.715E-01	7.70E-02	G
		1004.80	-5.591E-02	%	4.174E-01	1.20E-01	G
EU-155	-8.7261E-03						
		86.45	-8.726E-03	%(P	2.658E-01	7.91E-02	G K
		105.31	6.563E-03	%	2.270E-01	6.73E-02	G
HG-203	1.9871E-02						
		279.17	1.987E-02	%(P	4.811E-02	1.45E-02	G K
		72.87	2.897E-02	%	2.422E+00	7.24E-01	G
		70.83	-1.470E+00	&	4.088E+00	1.23E+00	G
		82.50	4.322E-01	&	3.604E+00	1.08E+00	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	2.6940E-01						
		583.14	2.694E-01	(P	5.750E-02	2.85E-02	G
		510.72	4.721E-01	+	2.596E-01	1.12E-01	G
PB-212	6.5947E-01						
		238.63	6.546E-01	(	1.114E-01	4.30E-02	G K
							Energy duplication
		77.11	6.715E-01	*(	6.055E-01	1.88E-01	G
		74.81	1.304E+00	+ P	1.217E+00	3.77E-01	G
PB-214	4.0965E-01						
		351.99	3.846E-01	(P	1.082E-01	4.15E-02	G K
		295.22	4.581E-01	(	2.196E-01	7.46E-02	G
							Energy duplication
		77.11	1.098E+00	+	9.904E-01	3.07E-01	G
		241.92	3.781E-01	%	7.101E-01	2.16E-01	G
BI-212	5.6032E-01						
		727.17	5.603E-01	(	4.203E-01	1.58E-01	G K
		1620.56	-3.969E-01	& P	2.109E+00	5.80E-01	G
		785.42	5.913E-01	% P	2.412E+00	7.01E-01	G
BI-214	4.5921E-01						
		609.32	4.592E-01	(	9.288E-02	4.57E-02	G K
		1764.51	-9.164E-02	% P	4.837E-01	1.37E-01	G
		1120.28	1.834E-02	&	4.300E-01	1.20E-01	G
RA-224	8.5509E-01						
		241.00	8.551E-01	&(P	1.276E+00	3.91E-01	G
RA-226	9.8736E-01						
		185.99	9.874E-01	(P	1.282E+00	3.94E-01	G
AC-228	2.2366E-01						
		911.07	9.829E-03	%(P	2.040E-01	5.73E-02	G K
		968.90	-9.202E-02	% P	4.869E-01	1.42E-01	G
		338.40	7.400E-01	(	3.206E-01	1.13E-01	G
TH-227	1.4560E-01						
		236.00	1.456E-01	&(P	3.505E-01	1.06E-01	G K
		256.25	-3.951E-02	%	4.080E-01	1.19E-01	G
PA-234	3.8098E-02						
		98.44	3.810E-02	%(	2.370E-01	7.08E-02	G K
		946.00	1.017E-02	%	1.863E-01	4.99E-02	G
		131.28	-3.267E-02	%	2.611E-01	7.80E-02	G
		94.67	-2.248E-01	%	4.628E-01	1.40E-01	G
		883.24	-3.329E-02	&	4.375E-01	1.23E-01	G
		926.70	-1.051E-01	%	5.110E-01	1.48E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
		569.26	1.191E-02	&	5.482E-01	1.58E-01	G
TH-234	1.5916E+00						
		63.29	5.265E-01	%(P	4.707E+00	1.40E+00	G K
		92.80	2.182E+00	(	2.324E+00	7.18E-01	G
		92.38	2.519E+00	(P	2.688E+00	8.30E-01	G
AM-241	3.9864E-03						
		59.54	3.986E-03	&(	7.052E-01	2.09E-01	G

(- This peak used in the nuclide activity average.

* - Peak is too wide, but only one peak in library.
! - Peak is part of a multiplet and this area went negative during deconvolution.
? - Peak is too narrow.
@ - Peak is too wide at FW25M, but ok at FWHM.
% - Peak fails sensitivity test.
$ - Peak identified, but first peak of this nuclide failed one or more qualification tests.
+ - Peak activity higher than counting uncertainty range.
- - Peak activity lower than counting uncertainty range.
= - Peak outside analysis energy range.
& - Calculated peak centroid is not close enough to the library energy centroid for positive identification.
P - Peakbackground subtraction
} - Peak is too close to another for the activity to be found directly.

Nuclide Codes:	Peak Codes:
T - Thermal Neutron Activation	G - Gamma Ray
F - Fast Neutron Activation	X - X-Ray
I - Fission Product	P - Positron Decay
N - Naturally Occurring Isotope	S - Single-Escape
P - Photon Reaction	D - Double-Escape
C - Charged Particle Reaction	K - Key Line
M - No MDA Calculation	A - Not in Average
R - Coincidence Corrected	C - Coincidence Peak
H - Halflife limit exceeded	

- -

***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	7.8829E-02	8.0355E-02	3.5747E-01	3.5750E-01	4.003E-01
K-40		1.3180E+01	1.3180E+01	1.7544E+00	1.9040E+00	4.362E-01
MN-54	#A	1.4171E-02	1.4218E-02	4.5983E-02	4.5990E-02	5.230E-02
CO-57	#B	4.0457E-03	4.0611E-03	5.0629E-02	5.0630E-02	5.653E-02
CO-60	#B	2.3217E-03	2.3229E-03	5.2020E-02	5.2020E-02	6.331E-02

Sr-85	#A	-1.0223E-02	-1.0386E-02	5.6697E-02	5.6700E-02	6.321E-02
Kr-85	#A	-2.3600E+02	-2.3601E+02	1.2884E+03	1.2885E+03	1.459E+03
Y-88	#B	-2.1561E-05	-2.1769E-05	5.5944E-04	5.5944E-04	5.529E-02
NB-94	#B	-4.5741E-03	-4.5741E-03	4.6553E-02	4.6553E-02	5.495E-02
Ag-108M	#B	0.0000E+00	0.0000E+00	6.0857E-02	6.0857E-02	7.120E-02
CD-109	#A	2.3450E-03	2.3503E-03	1.8763E+00	1.8763E+00	2.098E+00
SN-113	#B	-1.4794E-02	-1.4927E-02	5.9622E-02	5.9627E-02	6.674E-02
SB-125	#B	1.4190E-02	1.4204E-02	1.0981E-01	1.0981E-01	1.270E-01
I-131	#B	-6.3280E-03	-7.1870E-03	4.9469E-02	4.9471E-02	4.968E-02
CS-134	#B	2.5140E-02	2.5174E-02	2.7376E-02	2.7412E-02	4.496E-02
CS-137	#A	7.7569E-03	7.7576E-03	4.1669E-02	4.1671E-02	4.858E-02
CE-139	#A	1.1062E-02	1.1145E-02	4.7103E-02	4.7107E-02	5.215E-02
EU-152	#B	8.3771E-03	8.3789E-03	1.5205E-01	1.5205E-01	1.705E-01
EU-154	#B	3.4735E-03	3.4746E-03	1.0545E-01	1.0545E-01	1.184E-01
EU-155	#B	-8.7212E-03	-8.7261E-03	1.9382E+00	1.9382E+00	2.657E-01
HG-203	#B	1.9439E-02	1.9871E-02	4.3523E-02	4.3537E-02	4.707E-02
TL-208		2.6940E-01	2.6940E-01	8.5391E-02	8.6719E-02	
PB-212	#	6.5947E-01	6.5947E-01	1.3001E-01	1.3517E-01	1.114E-01
PB-214	#	4.0965E-01	4.0965E-01	1.2002E-01	1.2221E-01	1.082E-01
BI-212		5.6032E-01	5.6032E-01	4.7288E-01	4.7392E-01	
BI-214		4.5921E-01	4.5921E-01	1.3682E-01	1.3923E-01	
RA-224	#A	8.5509E-01	8.5509E-01	1.1720E+00	1.1730E+00	1.276E+00
RA-226	#A	9.8736E-01	9.8736E-01	1.1821E+00	1.1834E+00	1.282E+00
AC-228	F	2.2366E-01	2.2366E-01	1.0281E-01	1.0358E-01	2.040E-01
TH-227	#B	1.4560E-01	1.4560E-01	3.1736E-01	3.1746E-01	3.505E-01
PA-234	#B	3.8098E-02	3.8098E-02	2.1250E-01	2.1251E-01	2.370E-01
TH-234	#B	1.5916E+00	1.5916E+00	1.5712E+00	1.5737E+00	4.707E+00
AM-241	#A	3.9864E-03	3.9864E-03	6.2849E-01	6.2849E-01	7.052E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (270.7 to 1999.0 keV) 1.4692291E+01 pCi/gm
Total Decayed Activity (270.7 to 1999.0 keV) 1.4692291E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
DAT

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 102F_25JUL2006_2034.An1

Sample description
FSS-OOL-05-05-004-F

Spectrum Filename: C:\GammaVision\Spectra\102F_25JUL2006_2034.An1

Acquisition information
Start time: 25-Jul-2006 20:34:39
Live time: 2000
Real time: 2016
Dead time: 0.80 %
Detector ID: 3

Detector system
Det 102 - DSPP-468

Calibration
Filename: D2_1LSa.Clb
DET 102 1 Liter Sand Geometry

Energy Calibration
Created: 15-Jan-2005 03:09:29
Zero offset: 0.220 keV
Gain: 0.500 keV/channel
Quadratic: -6.435E-08 keV/channel^2

Efficiency Calibration
Created: 15-Jan-2005 06:48:10
Type: Polynomial
Uncertainty: 0.497 %
Coefficients: -0.294180 -5.980622 0.744607
-0.096737 0.005214 -0.000120

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.22keV)
Stop channel: 4000 (1999.02keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 1.7730E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.7730E+03) =
5.6402E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	24-Jul-2006 09:50:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	102_150K_28APR05.Pbc 01-May-2005 05:27:47
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 10 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.8388

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
76.28	230.	18.79	1.07	9.295E-03				
76.28	230.	18.79	1.07	9.295E-03	77.11	10.700	1.718E+00	PB214
					77.11	17.500	1.050E+00	PB212
129.28	58.	35.67	0.69	1.716E-02				
185.99	97.	26.23	1.49	1.627E-02	185.99	3.280	1.319E+00	RA226
209.49	47.	39.44	0.78	1.518E-02				
239.09	362.	6.38	1.22	1.378E-02	238.63	43.100	4.640E-01	PB212
					241.00	3.900	5.152E+00	RA224
242.27	73.	24.71	1.22	1.363E-02	241.92	7.470	5.452E-01	PB214
295.85	105.	15.11	1.49	1.144E-02	295.22	19.200	3.625E-01	PB214
339.31	81.	23.48	1.33	1.003E-02	338.40	12.010	5.122E-01	AC228
352.54	169.	12.56	1.22	9.664E-03	351.99	37.100	3.583E-01	PB214
511.79	50.	24.12	1.08	6.695E-03	510.72	22.500	2.550E-01	TL208
584.46	128.	12.23	1.38	5.877E-03	583.14	86.000	1.914E-01	TL208
610.56	116.	12.81	1.64	5.638E-03	609.32	46.090	3.393E-01	BI214
728.84	27.	32.48	1.55	4.794E-03	727.17	11.800	3.680E-01	BI212
913.58	100.	12.20	1.65	3.912E-03	911.07	29.000	6.720E-01	AC228
970.68	47.	21.08	1.72	3.718E-03	968.90	17.460	5.533E-01	AC228
1463.49	465.	4.71	2.25	2.617E-03				

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
418.61	209.49	142.	47.	0.024	118.32	0.782	AC-228	M
477.82	239.16	86.	362.	0.181	19.14	1.215	PB-212	D

484.18	242.34	126.	73.	0.036	74.13	1.217	XE-138	D
1827.31	913.58	72.	42.	0.021	97.83	1.651	AC-228	sM
2927.88	1463.49	8.	462.	0.231	14.21	2.247	K-40	M

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.
M - Peak is close to a library peak.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-214	153.80	77.11	702.	117.	0.058	100.08	1.500D
PB-212	153.80	77.11	702.	117.	0.058	100.08	1.500D
RA-226	371.59	185.99	296.	69.	0.035	104.07	1.500D
PB-212	477.94	239.16	256.	313.	0.156	27.54	1.500s
RA-224	477.97	239.17	149.	340.	0.170	22.22	1.500s
PB-214	591.40	295.87	106.	114.	0.057	47.44	1.500
AC-228	677.69	339.01	98.	71.	0.036	68.69	1.500
PB-214	704.97	352.64	89.	159.	0.079	34.49	1.500
TL-208	1023.37	511.79	41.	50.	0.025	72.37	1.082
TL-208	1168.76	584.46	42.	127.	0.064	36.69	1.377
BI-214	1220.98	610.56	36.	116.	0.058	38.44	1.637
BI-212	1457.65	728.84	26.	27.	0.014	97.44	1.554s
AC-228	1825.87	912.87	29.	58.	0.029	55.17	1.679
AC-228	1941.57	970.68	26.	47.	0.024	63.25	1.718

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	MDA Value pCi/gm	COMMENTS
BE-7		-1.2683E-01					
			477.56	-1.268E-01	&(	4.386E-01	1.30E-01 G
K-40		7.4734E-02					
			1460.75	7.473E-02	%(P	1.106E+00	3.16E-01 G
MN-54		-1.4260E-02					
			834.81	-1.426E-02	%(P	5.954E-02	1.73E-02 G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CO-57	3.1595E-03						
		122.07	3.160E-03	%(	4.878E-02	1.44E-02	G K
		136.43	-8.173E-02	%	4.004E-01	1.20E-01	G
CO-60	-1.4828E-02						
		1332.51	-1.483E-02	&(P	7.046E-02	2.01E-02	G K
		1173.23	-2.392E-02	%	8.858E-02	2.60E-02	G K
Sr-85	-1.2429E-02						
		514.00	-1.243E-02	&(	5.461E-02	1.61E-02	G
Kr-85	-2.8240E+02						
		513.99	-2.824E+02	&(	1.241E+03	3.65E+02	G
Y-88	1.2722E-02						
		1836.01	1.272E-02	&(P	3.187E-02	9.53E-03	G K
		898.02	1.094E-02	% P	5.240E-02	1.49E-02	G
NB-94	2.5848E-03						
		871.10	2.585E-03	%(	5.046E-02	1.40E-02	G K
		702.50	1.320E-02	%	4.528E-02	1.33E-02	G K
Ag-108M	9.3628E-03						
		722.95	9.363E-03	&(	5.427E-02	1.56E-02	G K
		614.37	-1.376E-02	& P	5.935E-02	1.73E-02	G
		433.93	9.805E-03	&	3.362E-02	9.87E-03	G
CD-109	-6.9892E-01						
		88.04	-6.989E-01	%(P	2.193E+00	6.60E-01	G
SN-113	-1.3376E-02						
		391.71	-1.338E-02	%(	6.657E-02	1.95E-02	G K
		255.04	8.923E-02	&	1.518E+00	4.40E-01	G
SB-125	2.2838E-02						
		427.95	2.284E-02	&(P	9.346E-02	2.69E-02	G K
		600.77	-2.752E-02	& P	2.602E-01	7.42E-02	G
		636.15	6.037E-02	& P	3.433E-01	9.78E-02	G
		463.51	1.695E-01	% P	3.715E-01	1.12E-01	G
		176.29	-4.810E-02	% P	5.901E-01	1.73E-01	G
I-131	-2.4551E-03						
		364.48	-2.455E-03	%(	5.116E-02	1.47E-02	G K
		636.97	5.260E-02	&	5.894E-01	1.64E-01	G
		284.29	1.278E-02	&	7.188E-01	2.09E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CS-134	5.5105E-03						
		604.66	5.511E-03	%(	4.005E-02	1.14E-02	G K
		795.76	2.494E-02	&	5.568E-02	1.68E-02	G
		569.29	1.020E-01	%	2.424E-01	7.28E-02	G
		801.84	-1.437E-01	% P	6.459E-01	1.87E-01	G
CS-137	-7.5218E-03						
		661.62	-7.522E-03	%(	6.135E-02	1.76E-02	G
CE-139	-3.9209E-03						
		165.85	-3.921E-03	&(P	4.674E-02	1.38E-02	G
EU-152	-8.3076E-04						
		121.78	-8.308E-04	%(P	1.403E-01	4.13E-02	G K
		344.30	-1.970E-02	%	1.419E-01	4.14E-02	G
		1408.08	0.000E+00	%	1.469E-01	3.36E-02	G
		964.00	-1.128E-01	% P	4.390E-01	1.28E-01	G
		1112.07	-2.704E-02	&	4.613E-01	1.28E-01	G
		778.90	-7.450E-02	% P	4.155E-01	1.19E-01	G
EU-154	1.9174E-02						
		123.10	1.917E-02	&(P	1.047E-01	3.12E-02	G K
		1274.80	2.572E-02	&	1.708E-01	4.78E-02	G
		723.30	3.319E-02	& P	2.560E-01	7.28E-02	G
		1004.80	1.003E-01	%	2.879E-01	8.49E-02	G
EU-155	-1.3620E-02						
		86.45	-1.362E-02	&(P	2.607E-01	7.74E-02	G K
		105.31	4.754E-02	%	2.092E-01	6.25E-02	G
HG-203	1.6069E-02						
		279.17	1.607E-02	%(P	4.526E-02	1.36E-02	G K
		72.87	-5.413E-01	&	2.048E+00	6.16E-01	G
		70.83	4.166E-01	%	3.394E+00	1.01E+00	G
		82.50	-7.007E-01	%	3.374E+00	1.01E+00	G
TL-208	2.0458E-01						
		583.14	1.914E-01	(P	4.942E-02	2.35E-02	G
		510.72	2.550E-01	(	1.640E-01	6.16E-02	G
PB-212	4.0094E-01						
		238.63	4.009E-01	@(	9.904E-02	3.68E-02	G K
							Energy duplication
		77.11	5.337E-01	+	5.760E-01	1.78E-01	G
		74.81	5.511E-01	& P	1.190E+00	3.60E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
PB-214	3.5716E-01						
		351.99	3.374E-01	(P	9.884E-02	3.89E-02	G K
		295.22	3.953E-01	(	1.754E-01	6.25E-02	G
							Energy duplication
		77.11	8.729E-01	+	9.421E-01	2.91E-01	G
		241.92	3.710E-01	&	6.191E-01	1.89E-01	G
BI-212	3.6801E-01						
		727.17	3.680E-01	&(	3.548E-01	1.20E-01	G K
		1620.56	-3.880E-02	& P	2.532E+00	6.67E-01	G
		785.42	5.100E-01	& P	2.035E+00	5.86E-01	G
BI-214	3.3927E-01						
		609.32	3.393E-01	(	8.989E-02	4.36E-02	G K
		1764.51	-1.739E-02	& P	3.932E-01	1.03E-01	G
		1120.28	-7.837E-02	&	4.841E-01	1.39E-01	G
RA-224	4.8461E+00						
		241.00	4.846E+00	*(P	8.510E-01	3.60E-01	G
RA-226	9.9258E-01						
							Energy duplication
		185.99	9.926E-01	*(P	1.185E+00	3.66E-01	G
AC-228	4.5201E-01						
		911.07	3.916E-01	(P	1.865E-01	7.23E-02	G K
		968.90	5.533E-01	(P	3.102E-01	1.17E-01	G
		338.40	4.507E-01	(	3.082E-01	1.03E-01	G
TH-227	-3.0967E-01						
		236.00	-3.097E-01	%(P	4.721E-01	1.45E-01	G K
		256.25	-1.701E-02	&	5.182E-01	1.51E-01	G
PA-234	-9.0737E-04						
		98.44	-9.074E-04	&(	2.271E-01	6.72E-02	G K
		946.00	8.327E-02	%	2.297E-01	6.79E-02	G
		131.28	-4.479E-02	%	2.217E-01	6.62E-02	G
		94.67	-1.475E-01	%	4.186E-01	1.26E-01	G
		883.24	-8.507E-02	&	4.291E-01	1.23E-01	G
		926.70	-5.239E-02	&	4.364E-01	1.22E-01	G
		569.26	1.512E-01	%	3.592E-01	1.08E-01	G
TH-234	9.6377E-01						
		63.29	9.638E-01	%(P	4.462E+00	1.34E+00	G K
		92.80	1.564E+00	&	2.211E+00	6.78E-01	G
		92.38	1.375E+00	% P	2.697E+00	8.19E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
AM-241	-1.0521E-01						
		59.54	-1.052E-01	%(	6.376E-01	1.90E-01	G

(- This peak used in the nuclide activity average.

* - Peak is too wide, but only one peak in library.
! - Peak is part of a multiplet and this area went negative during deconvolution.
? - Peak is too narrow.
@ - Peak is too wide at FW25M, but ok at FWHM.
% - Peak fails sensitivity test.
$ - Peak identified, but first peak of this nuclide failed one or more qualification tests.
+ - Peak activity higher than counting uncertainty range.
- - Peak activity lower than counting uncertainty range.
= - Peak outside analysis energy range.
& - Calculated peak centroid is not close enough to the library energy centroid for positive identification.
P - Peakbackground subtraction
} - Peak is too close to another for the activity to be found directly.

Nuclide Codes:
T - Thermal Neutron Activation
F - Fast Neutron Activation
I - Fission Product
N - Naturally Occurring Isotope
P - Photon Reaction
C - Charged Particle Reaction
M - No MDA Calculation
R - Coincidence Corrected
H - Halflife limit exceeded

Peak Codes:
G - Gamma Ray
X - X-Ray
P - Positron Decay
S - Single-Escape
D - Double-Escape
K - Key Line
A - Not in Average
C - Coincidence Peak

- -

***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	-1.2447E-01	-1.2683E-01	3.8910E-01	3.8917E-01	4.304E-01
K-40	A	7.4734E-02	7.4734E-02	9.4917E-01	9.4918E-01	1.106E+00
MN-54	#A	-1.4214E-02	-1.4260E-02	5.4729E-02	5.4735E-02	5.935E-02
CO-57	#B	3.1478E-03	3.1595E-03	4.3277E-02	4.3277E-02	4.860E-02
CO-60	#B	-1.4821E-02	-1.4828E-02	6.2158E-02	6.2164E-02	7.043E-02
Sr-85	#A	-1.2239E-02	-1.2429E-02	4.8211E-02	4.8216E-02	5.378E-02
Kr-85	#A	-2.8239E+02	-2.8240E+02	1.0959E+03	1.0960E+03	1.241E+03
Y-88	#B	1.2603E-02	1.2722E-02	2.8584E-02	2.8593E-02	3.158E-02
NB-94	#B	2.5848E-03	2.5848E-03	4.1853E-02	4.1853E-02	5.046E-02
Ag-108M	#B	9.3626E-03	9.3628E-03	4.6698E-02	4.6701E-02	5.426E-02
CD-109	#A	-6.9738E-01	-6.9892E-01	2.1219E+00	2.1223E+00	2.188E+00

SN-113	#B	-1.3260E-02	-1.3376E-02	5.8646E-02	5.8651E-02	6.600E-02
SB-125	#B	2.2815E-02	2.2838E-02	8.0725E-02	8.0735E-02	9.337E-02
I-131	#B	-2.1671E-03	-2.4551E-03	4.4060E-02	4.4061E-02	4.516E-02
CS-134	#B	5.5032E-03	5.5105E-03	3.4091E-02	3.4093E-02	4.000E-02
CS-137	#A	-7.5211E-03	-7.5218E-03	5.2720E-02	5.2722E-02	6.134E-02
CE-139	#A	-3.8924E-03	-3.9209E-03	4.6903E-02	4.6904E-02	4.640E-02
EU-152	#B	-8.3058E-04	-8.3076E-04	5.1217E-01	5.1217E-01	1.403E-01
EU-154	#B	1.9168E-02	1.9174E-02	9.3581E-02	9.3587E-02	1.047E-01
EU-155	#B	-1.3613E-02	-1.3620E-02	7.8729E-01	7.8729E-01	2.605E-01
HG-203	#B	1.5726E-02	1.6069E-02	4.0676E-02	4.0686E-02	4.429E-02
TL-208		2.0458E-01	2.0458E-01	7.5299E-02	7.6170E-02	
PB-212	#	4.0094E-01	4.0094E-01	1.1043E-01	1.1269E-01	9.904E-02
PB-214	#	3.5716E-01	3.5716E-01	1.0483E-01	1.0673E-01	9.884E-02
BI-212	#	3.6801E-01	3.6801E-01	3.5857E-01	3.5916E-01	3.548E-01
BI-214		3.3927E-01	3.3927E-01	1.3043E-01	1.3181E-01	
RA-224	#	4.8461E+00	4.8461E+00	1.0804E+00	1.1141E+00	8.510E-01
RA-226	#A	9.9258E-01	9.9258E-01	1.0992E+00	1.1007E+00	1.185E+00
AC-228		4.5201E-01	4.5201E-01	1.6361E-01	1.6557E-01	1.865E-01
TH-227	#B	-3.0967E-01	-3.0967E-01	4.3746E-01	4.3780E-01	4.721E-01
PA-234	#B	-9.0737E-04	-9.0737E-04	2.0156E-01	2.0156E-01	2.271E-01
TH-234	#B	9.6377E-01	9.6377E-01	4.0065E+00	4.0069E+00	4.462E+00
AM-241	#A	-1.0521E-01	-1.0521E-01	5.7062E-01	5.7065E-01	6.376E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (295.7 to 1999.0 keV) 9.9586135E-01 pCi/gm
Total Decayed Activity (295.7 to 1999.0 keV) 9.9586135E-01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
DAT

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 103F_25JUL2006_1623.An1

Sample description
FSS-OOL-05-05-022-F-B WET

Spectrum Filename: C:\GammaVision\Spectra\103F_25JUL2006_1623.An1

Acquisition information
Start time: 25-Jul-2006 16:23:33
Live time: 2000
Real time: 2002
Dead time: 0.08 %
Detector ID: 4

Detector system
Det 103 - DSPE-471

Calibration
Filename: D3_1LSa.Clb
Detector_103 1.0 Liter Sand Geometry

Energy Calibration
Created: 08-Aug-2005 11:09:41
Zero offset: 0.409 keV
Gain: 0.500 keV/channel
Quadratic: 1.092E-08 keV/channel^2

Efficiency Calibration
Created: 08-Aug-2005 11:11:25
Type: Polynomial
Uncertainty: 0.993 %
Coefficients: -0.264059 -5.138468 0.638383
-0.089199 0.005011 -0.000129

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.41keV)
Stop channel: 4000 (2000.67keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 2.1220E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 2.1220E+03) =
4.7125E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	25-Jul-2006 13:20:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	103_150K_05AUG05.Pbc 08-Aug-2005 12:54:15
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 12 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.2076

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
77.29	104.	28.10	0.79	1.020E-02	77.11	17.500	3.634E-01	PB212
					77.11	10.700	PBC<MDA	PB214
92.89	75.	40.31	1.50	1.631E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
185.91	115.	25.76	1.08	2.567E-02				
185.91	115.	25.76	1.08	2.567E-02	185.99	3.280	PBC<MDA	RA226
210.66	100.	28.33	1.19	2.465E-02				
238.94	624.	4.88	1.09	2.318E-02	238.63	43.100	3.901E-01	PB212
242.30	120.	17.40	1.10	2.300E-02	241.92	7.470	4.453E-01	PB214
269.96	65.	39.45	1.49	2.153E-02				
295.22	203.	14.40	1.01	2.025E-02	295.22	19.200	3.256E-01	PB214
328.05	56.	29.91	1.44	1.874E-02				
338.47	151.	18.93	0.72	1.830E-02	338.40	12.010	4.337E-01	AC228
352.12	291.	8.04	1.15	1.775E-02	351.99	37.100	2.761E-01	PB214
408.78	66.	28.96	0.76	1.577E-02				
463.23	32.	41.50	1.50	1.425E-02				
463.23	32.	41.50	1.50	1.425E-02	463.51	10.000	PBC<MDA	SB125
477.81	88.	22.25	1.24	1.390E-02	477.56	10.300	3.901E-01	BE7
511.50	104.	17.26	1.60	1.316E-02	510.72	22.500	1.670E-01	TL208
					513.99	0.004	1.180E+03	Kr85
					514.00	99.270	5.118E-02	Sr85
583.21	211.	10.22	1.33	1.184E-02	583.14	86.000	1.291E-01	TL208
609.56	250.	8.26	1.39	1.144E-02	609.32	46.090	2.941E-01	BI214
661.50	33.	37.19	1.37	1.072E-02				
661.50	33.	37.19	1.37	1.072E-02	661.62	84.620	PBC<MDA	CS137
727.67	39.	31.03	1.50	9.965E-03	727.17	11.800	2.124E-01	BI212
911.29	138.	13.59	1.34	8.400E-03	911.07	29.000	3.509E-01	AC228

969.11	115.	15.96	1.14	8.025E-03	968.90	17.460	5.201E-01	AC228
1120.65	70.	19.70	1.41	7.210E-03	1120.28	15.040	3.987E-01	BI214
1461.18	942.	3.42	1.76	5.931E-03	1460.75	10.700	9.268E+00	K40
1764.32	39.	15.43	2.04	5.142E-03	1764.51	15.920	3.013E-01	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide
420.48	210.66	304.	100.	0.050	84.99	1.190	TH-227 s
539.08	269.96	237.	65.	0.032	118.35	1.490	AC-228 s
655.23	328.05	108.	56.	0.028	89.73	1.438	AC-228 s
816.69	408.78	106.	66.	0.033	86.88	0.758	CS-138 s

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-212	153.39	77.11	232.	68.	0.034	100.68	0.995A
RA-226	371.69	186.26	472.	95.	0.047	89.26	1.500s
PB-212	476.99	238.92	539.	559.	0.280	23.46	0.848
PB-214	483.66	242.25	241.	69.	0.034	100.11	0.615s
PB-214	589.59	295.22	236.	199.	0.099	43.20	1.006
AC-228	676.08	338.47	215.	150.	0.075	56.79	0.722s
PB-214	703.38	352.12	117.	286.	0.143	24.12	1.154s
BE-7	954.74	477.81	104.	88.	0.044	66.75	1.236
TL-208	1022.11	511.50	108.	78.	0.039	51.78	1.595s
TL-208	1165.52	583.21	84.	206.	0.103	30.66	1.328s
BI-214	1218.21	609.56	69.	244.	0.122	24.78	1.387
CS-137	1322.59	661.75	63.	32.	0.016	113.28	1.500s
BI-212	1454.40	727.67	57.	39.	0.020	93.08	1.500s
AC-228	1821.60	911.29	66.	134.	0.067	40.77	1.342s
AC-228	1937.23	969.11	60.	114.	0.057	47.87	1.138
BI-214	2240.28	1120.65	46.	68.	0.034	59.11	1.414s
K-40	2921.23	1461.18	38.	924.	0.462	10.26	1.758
BI-214	3527.39	1764.32	3.	39.	0.019	46.29	2.042s

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Code	MDA Value pCi/gm		COMMENTS
BE-7		3.9011E-01						
			477.56	3.901E-01	(	2.241E-01	8.68E-02	G
K-40		9.2684E+00						
			1460.75	9.268E+00	(P	3.162E-01	3.23E-01	G
MN-54		-1.0102E-03						
			834.81	-1.010E-03	%(P	3.007E-02	8.55E-03	G
CO-57		9.7358E-04						
			122.07	9.736E-04	%(P	3.649E-02	1.08E-02	G K
			136.43	6.532E-02	%	2.665E-01	7.99E-02	G
CO-60		1.7395E-03						
			1332.51	1.739E-03	&(P	3.004E-02	8.24E-03	G K
			1173.23	5.536E-03	& P	3.399E-02	9.74E-03	G K
Sr-85		6.3190E-03						
			514.00	6.319E-03	&(	2.262E-02	6.70E-03	G
Kr-85		1.4556E+02						
			513.99	1.456E+02	&(	5.216E+02	1.54E+02	G
Y-88		1.6825E-03						
			1836.01	1.682E-03	&(P	1.284E-02	3.18E-03	G K
			898.02	6.952E-03	% P	2.264E-02	6.62E-03	G
NB-94		7.0638E-03						
			871.10	7.064E-03	%(	2.331E-02	6.86E-03	G K
			702.50	3.222E-03	&	2.165E-02	6.22E-03	G K
Ag-108M		-1.1220E-02						
			722.95	-1.122E-02	%(	3.356E-02	1.00E-02	G K
			614.37	-4.704E-03	% P	2.903E-02	8.46E-03	G
			433.93	5.989E-04	%	2.455E-02	7.08E-03	G
CD-109		3.9835E-02						
			88.04	3.983E-02	&(	1.465E+00	4.36E-01	G
SN-113		-1.0539E-02						
			391.71	-1.054E-02	%(	3.544E-02	1.06E-02	G K
			255.04	-2.183E-01	%	1.183E+00	3.52E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	2.0040E-02						
		427.95	2.004E-02	&(P	6.700E-02	1.99E-02	G K
		600.77	-2.189E-02	% P	1.352E-01	3.94E-02	G
		636.15	4.544E-02	% P	1.848E-01	5.39E-02	G
		463.51	1.429E-01	% P	1.982E-01	6.17E-02	G
		176.29	-3.597E-02	%	3.990E-01	1.18E-01	G
I-131	-2.5588E-03						
		364.48	-2.559E-03	%(P	2.609E-02	7.59E-03	G K
		636.97	3.340E-02	&	3.241E-01	9.32E-02	G
		284.29	-6.418E-02	% P	4.114E-01	1.22E-01	G
CS-134	4.6259E-03						
		604.66	4.626E-03	%(	2.009E-02	5.86E-03	G K
		795.76	1.039E-03	% P	2.946E-02	8.33E-03	G
		569.29	-9.516E-03	% P	1.334E-01	3.73E-02	G
		801.84	-1.291E-02	& P	3.561E-01	1.01E-01	G
CS-137	2.2234E-02						
		661.62	2.223E-02	*(P	2.782E-02	8.76E-03	G
CE-139	-5.2790E-03						
		165.85	-5.279E-03	%(	3.512E-02	1.05E-02	G
EU-152	3.9121E-02						
		121.78	3.912E-02	%(P	8.697E-02	2.63E-02	G K
		344.30	-1.728E-02	% P	8.554E-02	2.53E-02	G
		1408.08	-1.918E-03	&	1.157E-01	3.12E-02	G
		964.00	6.647E-02	% P	1.951E-01	5.78E-02	G
		1112.07	0.000E+00	&	2.960E-01	8.45E-02	G
		778.90	-3.429E-02	%	1.964E-01	5.69E-02	G
EU-154	1.1104E-02						
		123.10	1.110E-02	%(	7.759E-02	2.32E-02	G K
		1274.80	-2.116E-02	%	9.920E-02	2.89E-02	G
		723.30	1.420E-03	&	1.547E-01	4.44E-02	G
		1004.80	1.985E-02	&	1.369E-01	3.89E-02	G
EU-155	5.8885E-03						
		86.45	5.888E-03	&(	1.699E-01	5.05E-02	G K
		105.31	-1.162E-02	%	1.580E-01	4.69E-02	G
HG-203	9.7831E-04						
		279.17	9.783E-04	&(P	2.884E-02	8.47E-03	G K
		72.87	-1.730E-01	% P	1.338E+00	3.98E-01	G
		70.83	-3.948E-02	&	2.729E+00	8.08E-01	G
		82.50	0.000E+00	&	2.765E+00	8.20E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	1.3696E-01						
		583.14	1.291E-01	@(P	2.832E-02	1.35E-02	G
		510.72	1.670E-01	*(P	1.100E-01	3.88E-02	G
PB-212	3.6946E-01						
		238.63	3.561E-01	(P	7.063E-02	2.85E-02	G K
							Energy duplication
		77.11	2.454E-01	} P	2.653E-01	8.23E-02	G
		74.81	2.767E-01	% P	8.732E-01	2.63E-01	G
PB-214	2.8850E-01						
		351.99	2.761E-01	@(P	5.145E-02	2.26E-02	G K
		295.22	3.256E-01	(P	1.218E-01	4.78E-02	G
							Energy duplication
		77.11	0.000E+00	} P	6.718E-01	0.00E+00	G
		241.92	2.548E-01	(	2.780E-01	8.51E-02	G
BI-212	2.1236E-01						
		727.17	2.124E-01	(P	2.044E-01	6.67E-02	G K
		1620.56	8.606E-02	& P	7.730E-01	2.09E-01	G
		785.42	3.987E-01	%	1.141E+00	3.39E-01	G
BI-214	2.9598E-01						
		609.32	2.941E-01	(P	5.019E-02	2.49E-02	G K
		1764.51	3.013E-01	(P	8.666E-02	5.04E-02	G
		1120.28	3.987E-01	+ P	2.017E-01	8.08E-02	G
RA-224	-6.0271E-02						
		241.00	-6.027E-02	&(	6.677E-01	1.98E-01	G
RA-226	7.1606E-01						
		185.99	7.161E-01	*(P	7.862E-01	2.42E-01	G
AC-228	3.7514E-01						
		911.07	3.509E-01	@(P	1.059E-01	4.89E-02	G K
		968.90	5.201E-01	+ P	1.757E-01	8.31E-02	G
		338.40	4.337E-01	(P	2.060E-01	8.27E-02	G
TH-227	-2.4814E-02						
		236.00	-2.481E-02	&(	2.720E-01	8.09E-02	G K
		256.25	-5.836E-02	% P	3.788E-01	1.13E-01	G
PA-234	2.0751E-02						
		98.44	2.075E-02	%(P	1.654E-01	4.93E-02	G K
		946.00	-2.269E-02	& P	1.364E-01	3.93E-02	G
		131.28	4.848E-02	& P	1.369E-01	4.12E-02	G
		94.67	-2.217E-02	% P	3.039E-01	9.05E-02	G
		883.24	-3.930E-02	&	2.455E-01	7.11E-02	G
		926.70	8.445E-02	%	1.575E-01	4.86E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
		569.26	-1.266E-02	% P	2.070E-01	5.81E-02	G
TH-234	2.7594E-01						
		63.29	2.759E-01	%(P	4.773E+00	1.41E+00	G K
		92.80	7.919E-01	% P	1.589E+00	4.79E-01	G
		92.38	1.145E+00	& P	1.879E+00	5.70E-01	G
AM-241	1.8523E-01						
		59.54	1.852E-01	%(P	6.821E-01	2.04E-01	G

(- This peak used in the nuclide activity average.

* - Peak is too wide, but only one peak in library.
! - Peak is part of a multiplet and this area went negative during deconvolution.
? - Peak is too narrow.
@ - Peak is too wide at FW25M, but ok at FWHM.
% - Peak fails sensitivity test.
$ - Peak identified, but first peak of this nuclide failed one or more qualification tests.
+ - Peak activity higher than counting uncertainty range.
- - Peak activity lower than counting uncertainty range.
= - Peak outside analysis energy range.
& - Calculated peak centroid is not close enough to the library energy centroid for positive identification.
P - Peakbackground subtraction
} - Peak is too close to another for the activity to be found directly.

Nuclide Codes:	Peak Codes:
T - Thermal Neutron Activation	G - Gamma Ray
F - Fast Neutron Activation	X - X-Ray
I - Fission Product	P - Positron Decay
N - Naturally Occurring Isotope	S - Single-Escape
P - Photon Reaction	D - Double-Escape
C - Charged Particle Reaction	K - Key Line
M - No MDA Calculation	A - Not in Average
R - Coincidence Corrected	C - Coincidence Peak
H - Halflife limit exceeded	

- -

***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7		3.8947E-01	3.9011E-01	2.6041E-01	2.6139E-01	
K-40		9.2684E+00	9.2684E+00	9.6977E-01	1.1091E+00	
MN-54	#A	-1.0099E-03	-1.0102E-03	4.2900E-02	4.2900E-02	3.006E-02
CO-57	#B	9.7326E-04	9.7358E-04	3.2479E-02	3.2479E-02	3.648E-02
CO-60	#B	1.7394E-03	1.7395E-03	2.4706E-02	2.4706E-02	3.004E-02

Sr-85	#A	6.3104E-03	6.3190E-03	2.0093E-02	2.0097E-02	2.259E-02
Kr-85	#A	1.4556E+02	1.4556E+02	4.6323E+02	4.6331E+02	5.216E+02
Y-88	#B	1.6811E-03	1.6825E-03	9.5449E-03	9.5454E-03	1.283E-02
NB-94	#B	7.0638E-03	7.0638E-03	2.0583E-02	2.0587E-02	2.331E-02
Ag-108M	#B	-1.1220E-02	-1.1220E-02	3.0024E-02	3.0031E-02	3.356E-02
CD-109	#A	3.9827E-02	3.9835E-02	1.3074E+00	1.3074E+00	1.465E+00
SN-113	#B	-1.0531E-02	-1.0539E-02	3.1690E-02	3.1696E-02	3.541E-02
SB-125	#B	2.0038E-02	2.0040E-02	5.9681E-02	5.9692E-02	6.700E-02
I-131	#B	-2.5309E-03	-2.5588E-03	2.9136E-02	2.9137E-02	2.581E-02
CS-134	#B	4.6254E-03	4.6259E-03	1.7573E-02	1.7575E-02	2.008E-02
CS-137	#A	2.2233E-02	2.2234E-02	2.6289E-02	2.6321E-02	2.782E-02
CE-139	#A	-5.2756E-03	-5.2790E-03	3.1449E-02	3.1450E-02	3.509E-02
EU-152	#B	3.9121E-02	3.9121E-02	7.8941E-02	7.8970E-02	8.697E-02
EU-154	#B	1.1104E-02	1.1104E-02	6.9478E-02	6.9480E-02	7.759E-02
EU-155	#B	5.8882E-03	5.8885E-03	1.5153E-01	1.5153E-01	1.699E-01
HG-203	#B	9.7646E-04	9.7831E-04	2.5399E-02	2.5399E-02	2.878E-02
TL-208	#	1.3696E-01	1.3696E-01	4.2872E-02	4.3603E-02	
PB-212		3.6946E-01	3.6946E-01	8.8532E-02	9.1093E-02	
PB-214		2.8850E-01	2.8850E-01	7.0973E-02	7.2922E-02	
BI-212	#	2.1236E-01	2.1236E-01	2.0015E-01	2.0053E-01	2.044E-01
BI-214		2.9598E-01	2.9598E-01	7.5292E-02	7.7228E-02	
RA-224	#A	-6.0271E-02	-6.0271E-02	5.9371E-01	5.9372E-01	6.677E-01
RA-226	#A	7.1606E-01	7.1606E-01	7.2667E-01	7.2786E-01	7.862E-01
AC-228		3.7514E-01	3.7514E-01	1.3289E-01	1.3466E-01	
TH-227	#B	-2.4814E-02	-2.4814E-02	2.4273E-01	2.4274E-01	2.720E-01
PA-234	#B	2.0751E-02	2.0751E-02	1.4797E-01	1.4797E-01	1.654E-01
TH-234	#B	2.7594E-01	2.7594E-01	4.2395E+00	4.2396E+00	4.773E+00
AM-241	#A	1.8523E-01	1.8523E-01	6.1238E-01	6.1247E-01	6.821E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (93.4 to 2000.7 keV) 1.1123924E+01 pCi/gm
Total Decayed Activity (93.4 to 2000.7 keV) 1.1124570E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
DAT

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 103F_25JUL2006_1703.An1

Sample description
FSS-OOL-05-05-001-F

Spectrum Filename: C:\GammaVision\Spectra\103F_25JUL2006_1703.An1

Acquisition information
Start time: 25-Jul-2006 17:03:23
Live time: 2000
Real time: 2001
Dead time: 0.06 %
Detector ID: 4

Detector system
Det 103 - DSPE-471

Calibration
Filename: D3_1LSa.Clb
Detector_103 1.0 Liter Sand Geometry

Energy Calibration
Created: 08-Aug-2005 11:09:41
Zero offset: 0.409 keV
Gain: 0.500 keV/channel
Quadratic: 1.092E-08 keV/channel^2

Efficiency Calibration
Created: 08-Aug-2005 11:11:25
Type: Polynomial
Uncertainty: 0.993 %
Coefficients: -0.264059 -5.138468 0.638383
-0.089199 0.005011 -0.000129

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.41keV)
Stop channel: 4000 (2000.67keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 1.5090E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.5090E+03) =
6.6269E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	24-Jul-2006 09:57:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	103_150K_05AUG05.Pbc 08-Aug-2005 12:54:15
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 13 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.1954

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
74.88	67.	28.18	0.99	9.052E-03	74.81	9.600	6.938E-01	PB212
77.18	62.	31.03	0.99	1.011E-02	77.11	17.500	4.812E-01	PB212
					77.11	10.700	7.870E-01	PB214
186.24	132.	20.33	1.12	2.566E-02	185.99	3.280	1.266E+00	RA226
239.06	490.	7.37	0.89	2.318E-02	238.63	43.100	4.285E-01	PB212
270.00	58.	35.17	1.51	2.152E-02				
295.32	152.	15.00	1.10	2.024E-02	295.22	19.200	3.408E-01	PB214
327.89	48.	36.25	1.16	1.875E-02				
338.64	129.	19.31	1.27	1.829E-02	338.40	12.010	5.228E-01	AC228
351.87	206.	10.88	1.11	1.776E-02	351.99	37.100	2.731E-01	PB214
510.70	102.	16.62	1.54	1.317E-02				
510.70	102.	16.62	1.54	1.317E-02	510.72	22.500	2.288E-01	TL208
583.52	195.	11.85	1.05	1.184E-02	583.14	86.000	1.676E-01	TL208
609.39	162.	10.46	1.41	1.144E-02	609.32	46.090	2.633E-01	BI214
727.37	71.	22.93	1.36	9.963E-03	727.17	11.800	5.339E-01	BI212
911.43	144.	12.49	1.54	8.399E-03	911.07	29.000	5.184E-01	AC228
968.94	87.	20.21	1.16	8.026E-03	968.90	17.460	5.563E-01	AC228
1119.98	45.	33.17	1.54	7.213E-03	1120.28	15.040	3.576E-01	BI214
1461.16	726.	3.77	1.87	5.931E-03	1460.75	10.700	9.972E+00	K40
1621.45	13.	27.74	1.13	5.488E-03	1620.56	2.750	7.688E-01	BI212
1764.89	27.	21.60	0.79	5.142E-03	1764.51	15.920	2.924E-01	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide

539.15	270.00	153.	58.	0.029	105.51	1.507	AC-228	s
654.91	327.89	112.	48.	0.024	108.76	1.161	AC-228	s

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-212	148.79	74.81	165.	67.	0.034	84.55	0.993D
PB-212	153.39	77.11	179.	62.	0.031	93.08	0.995A
RA-226	371.64	186.24	258.	119.	0.060	60.98	1.121
PB-212	477.21	239.03	316.	421.	0.211	23.61	0.879
PB-214	589.79	295.32	151.	148.	0.074	44.99	1.101
AC-228	676.42	338.64	161.	128.	0.064	57.92	1.267s
PB-214	702.87	351.87	116.	201.	0.100	32.64	1.107
TL-208	1020.75	510.82	74.	50.	0.025	51.00	1.500s
TL-208	1165.78	583.34	67.	148.	0.074	32.74	1.500s
BI-214	1217.88	609.39	56.	155.	0.078	31.37	1.411
BI-212	1453.81	727.37	51.	70.	0.035	68.80	1.361s
AC-228	1821.88	911.43	51.	141.	0.071	37.47	1.536
AC-228	1936.90	968.94	59.	87.	0.044	60.64	1.164
BI-214	2238.94	1119.98	55.	43.	0.022	99.50	1.540
K-40	2921.18	1461.16	27.	707.	0.353	11.31	1.870
BI-212	3241.70	1621.45	0.	13.	0.006	83.21	1.125s
BI-214	3528.54	1764.89	6.	27.	0.013	64.81	0.785s

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	Peak MDA Value pCi/gm	COMMENTS
BE-7		1.3071E-01					
			477.56	1.307E-01	%(	2.908E-01 8.79E-02	G
K-40		9.9719E+00					
			1460.75	9.972E+00	(P	3.813E-01 3.86E-01	G
MN-54		-3.5826E-04					
			834.81	-3.583E-04	%(P	3.007E-02 8.26E-03	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CO-57	-1.1452E-03						
		122.07	-1.145E-03	%(P	4.772E-02	1.41E-02	G K
		136.43	4.296E-02	%	3.357E-01	9.98E-02	G
CO-60	1.4072E-02						
		1332.51	1.407E-02	%(P	2.958E-02	8.70E-03	G K
		1173.23	-3.256E-03	& P	4.001E-02	1.08E-02	G K
Sr-85	-8.2452E-03						
		514.00	-8.245E-03	%(	3.353E-02	9.90E-03	G
Kr-85	-1.8851E+02						
		513.99	-1.885E+02	%(	7.635E+02	2.25E+02	G
Y-88	-2.4304E-03						
		1836.01	-2.430E-03	%(P	2.328E-02	5.90E-03	G K
		898.02	-3.253E-03	% P	3.594E-02	1.00E-02	G
NB-94	6.5197E-03						
		871.10	6.520E-03	%(	2.126E-02	6.17E-03	G K
		702.50	9.315E-04	%	3.975E-02	1.14E-02	G K
Ag-108M	8.8976E-04						
		722.95	8.898E-04	%(	3.460E-02	9.73E-03	G K
		614.37	-3.054E-03	% P	3.716E-02	1.07E-02	G
		433.93	-1.207E-05	&	3.119E-02	8.92E-03	G
CD-109	1.3052E-01						
		88.04	1.305E-01	&(	1.497E+00	4.43E-01	G
SN-113	-8.7858E-03						
		391.71	-8.786E-03	&(	4.829E-02	1.42E-02	G K
		255.04	5.417E-01	%	1.384E+00	4.17E-01	G
SB-125	1.6043E-02						
		427.95	1.604E-02	%(P	8.541E-02	2.49E-02	G K
		600.77	3.749E-03	% P	1.334E-01	3.72E-02	G
		636.15	-1.737E-03	% P	2.439E-01	6.78E-02	G
		463.51	1.520E-01	% P	3.021E-01	9.16E-02	G
		176.29	3.577E-02	%	4.865E-01	1.44E-01	G
I-131	-3.4786E-03						
		364.48	-3.479E-03	%(P	3.401E-02	9.81E-03	G K
		636.97	0.000E+00	%	5.337E-01	1.52E-01	G
		284.29	-9.433E-02	% P	5.742E-01	1.70E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CS-134	-8.4405E-03						
		604.66	-8.440E-03	%(	3.503E-02	1.03E-02	G K
		795.76	1.239E-02	& P	3.528E-02	1.05E-02	G
		569.29	1.061E-02	% P	1.533E-01	4.27E-02	G
		801.84	-1.665E-02	% P	3.659E-01	1.00E-01	G
CS-137	2.8342E-02						
		661.62	2.834E-02	%(P	4.101E-02	1.27E-02	G
CE-139	8.0221E-03						
		165.85	8.022E-03	&(	4.117E-02	1.23E-02	G
EU-152	-4.0339E-03						
		121.78	-4.034E-03	%(P	1.362E-01	4.03E-02	G K
		344.30	-1.390E-02	% P	1.046E-01	3.06E-02	G
		1408.08	2.079E-03	&	1.484E-01	3.95E-02	G
		964.00	1.206E-01	% P	2.529E-01	7.65E-02	G
		1112.07	-3.852E-02	%	3.186E-01	9.12E-02	G
		778.90	-5.427E-02	%	2.211E-01	6.43E-02	G
EU-154	3.5833E-03						
		123.10	3.583E-03	%(	9.520E-02	2.82E-02	G K
		1274.80	3.820E-02	%	1.072E-01	3.18E-02	G
		723.30	0.000E+00	%	2.983E-01	8.68E-02	G
		1004.80	2.645E-02	%	1.788E-01	5.06E-02	G
EU-155	-2.8745E-03						
		86.45	-2.874E-03	&(	1.794E-01	5.29E-02	G K
		105.31	2.700E-02	%	1.921E-01	5.71E-02	G
HG-203	-2.1149E-03						
		279.17	-2.115E-03	%(P	3.637E-02	1.07E-02	G K
		72.87	-4.190E-01	& P	1.975E+00	5.91E-01	G
		70.83	2.193E-01	%	3.700E+00	1.10E+00	G
		82.50	-4.940E-01	%	3.360E+00	1.00E+00	G
TL-208	1.3493E-01						
		583.14	1.305E-01	@(P	3.587E-02	1.46E-02	G
		510.72	1.520E-01	*(P	1.292E-01	3.95E-02	G
PB-212	3.7728E-01						
		238.63	3.773E-01	(P	7.659E-02	3.06E-02	G K
							Energy duplication
		77.11	3.160E-01	} P	3.290E-01	9.80E-02	G
		74.81	6.938E-01	+ P	6.444E-01	2.05E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
PB-214	2.9619E-01						
		351.99	2.731E-01	(P	7.197E-02	3.05E-02	G K
		295.22	3.408E-01	(P	1.382E-01	5.25E-02	G
							Energy duplication
		77.11	2.292E-01	} P	7.669E-01	1.89E-01	G
		241.92	1.585E-01	%	4.990E-01	1.50E-01	G
BI-212	5.7832E-01						
		727.17	5.339E-01	(P	2.738E-01	1.23E-01	G K
		1620.56	7.688E-01	(P	4.374E-01	2.14E-01	G
		785.42	-5.755E-02	&	1.430E+00	3.98E-01	G
BI-214	2.7079E-01						
		609.32	2.633E-01	(P	6.382E-02	2.87E-02	G K
		1764.51	2.924E-01	(P	1.573E-01	7.09E-02	G
		1120.28	3.576E-01	+ P	3.069E-01	1.24E-01	G
RA-224	3.6885E-01						
		241.00	3.688E-01	%(	9.328E-01	2.82E-01	G
RA-226	1.2663E+00						
		185.99	1.266E+00	(P	8.250E-01	2.86E-01	G
AC-228	5.3062E-01						
		911.07	5.184E-01	(P	1.322E-01	6.63E-02	G K
		968.90	5.563E-01	(P	2.460E-01	1.13E-01	G
		338.40	5.228E-01	*(P	2.517E-01	1.02E-01	G
TH-227	-8.5476E-02						
		236.00	-8.548E-02	&(	3.182E-01	9.53E-02	G K
		256.25	1.742E-01	% P	4.179E-01	1.26E-01	G
PA-234	4.1219E-03						
		98.44	4.122E-03	%(P	1.800E-01	5.31E-02	G K
		946.00	-3.872E-02	& P	1.996E-01	5.79E-02	G
		131.28	-2.475E-03	& P	1.804E-01	5.32E-02	G
		94.67	-5.820E-02	& P	3.449E-01	1.03E-01	G
		883.24	0.000E+00	%	2.726E-01	7.56E-02	G
		926.70	-2.924E-02	&	3.092E-01	8.74E-02	G
		569.26	1.642E-02	% P	2.346E-01	6.56E-02	G
TH-234	-9.4748E-02						
		63.29	-9.475E-02	&(P	5.625E+00	1.65E+00	G K
		92.80	6.852E-01	% P	1.827E+00	5.46E-01	G
		92.38	4.054E-01	% P	2.212E+00	6.54E-01	G

Nuclide Ave activity Energy Activity Code Peak MDA Comments

AM-241 -2.1529E-01
59.54-2.153E-01 %(P 9.392E-01 2.80E-01 G

(- This peak used in the nuclide activity average.

* - Peak is too wide, but only one peak in library.
! - Peak is part of a multiplet and this area went negative during deconvolution.
? - Peak is too narrow.
@ - Peak is too wide at FW25M, but ok at FWHM.
% - Peak fails sensitivity test.
$ - Peak identified, but first peak of this nuclide failed one or more qualification tests.
+ - Peak activity higher than counting uncertainty range.
- - Peak activity lower than counting uncertainty range.
= - Peak outside analysis energy range.
& - Calculated peak centroid is not close enough to the library energy centroid for positive identification.
P - Peakbackground subtraction
} - Peak is too close to another for the activity to be found directly.

Nuclide Codes:
T - Thermal Neutron Activation
F - Fast Neutron Activation
I - Fission Product
N - Naturally Occurring Isotope
P - Photon Reaction
C - Charged Particle Reaction
M - No MDA Calculation
R - Coincidence Corrected
H - Halflife limit exceeded

Peak Codes:
G - Gamma Ray
X - X-Ray
P - Positron Decay
S - Single-Escape
D - Double-Escape
K - Key Line
A - Not in Average
C - Coincidence Peak

- -

***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	1.2853E-01	1.3071E-01	2.6368E-01	2.6379E-01	2.860E-01
K-40		9.9719E+00	9.9719E+00	1.1580E+00	1.2946E+00	
MN-54	#A	-3.5723E-04	-3.5826E-04	1.7726E-02	1.7726E-02	2.998E-02
CO-57	#B	-1.1414E-03	-1.1452E-03	5.9540E-02	5.9540E-02	4.756E-02
CO-60	#B	1.4065E-02	1.4072E-02	2.6102E-02	2.6115E-02	2.957E-02
Sr-85	#A	-8.1317E-03	-8.2452E-03	2.9687E-02	2.9690E-02	3.306E-02
Kr-85	#A	-1.8851E+02	-1.8851E+02	6.7614E+02	6.7623E+02	7.635E+02
Y-88	#B	-2.4100E-03	-2.4304E-03	1.9449E-02	1.9450E-02	2.309E-02
NB-94	#B	6.5197E-03	6.5197E-03	1.8523E-02	1.8527E-02	2.126E-02
Ag-108M	#B	8.8975E-04	8.8976E-04	2.9202E-02	2.9202E-02	3.460E-02
CD-109	#A	1.3026E-01	1.3052E-01	1.3305E+00	1.3305E+00	1.494E+00

SN-113	#B	-8.7175E-03	-8.7858E-03	4.2646E-02	4.2649E-02	4.792E-02
SB-125	#B	1.6029E-02	1.6043E-02	7.4788E-02	7.4794E-02	8.534E-02
I-131	#B	-3.1109E-03	-3.4786E-03	3.9030E-02	3.9031E-02	3.041E-02
CS-134	#B	-8.4304E-03	-8.4405E-03	3.0923E-02	3.0927E-02	3.499E-02
CS-137	#A	2.8340E-02	2.8342E-02	3.8182E-02	3.8217E-02	4.101E-02
CE-139	#A	7.9699E-03	8.0221E-03	3.6842E-02	3.6845E-02	4.090E-02
EU-152	#B	-4.0331E-03	-4.0339E-03	2.2921E-01	2.2921E-01	1.362E-01
EU-154	#B	3.5822E-03	3.5833E-03	8.4538E-02	8.4538E-02	9.517E-02
EU-155	#B	-2.8731E-03	-2.8745E-03	1.5868E-01	1.5868E-01	1.793E-01
HG-203	#B	-2.0745E-03	-2.1149E-03	3.2577E-02	3.2577E-02	3.567E-02
TL-208	#	1.3493E-01	1.3493E-01	4.5458E-02	4.6128E-02	3.587E-02
PB-212		3.7728E-01	3.7728E-01	9.1606E-02	9.4188E-02	
PB-214		2.9619E-01	2.9619E-01	8.4587E-02	8.6317E-02	
BI-212		5.7832E-01	5.7832E-01	3.1372E-01	3.1551E-01	
BI-214		2.7079E-01	2.7079E-01	8.8502E-02	8.9888E-02	
RA-224	#A	3.6885E-01	3.6885E-01	8.4451E-01	8.4478E-01	9.328E-01
RA-226		1.2663E+00	1.2663E+00	8.5630E-01	8.5945E-01	
AC-228		5.3062E-01	5.3062E-01	1.6377E-01	1.6664E-01	
TH-227	#B	-8.5476E-02	-8.5476E-02	2.8585E-01	2.8590E-01	3.182E-01
PA-234	#B	4.1219E-03	4.1219E-03	1.5919E-01	1.5919E-01	1.800E-01
TH-234	#B	-9.4748E-02	-9.4748E-02	9.2991E+00	9.2991E+00	5.625E+00
AM-241	#A	-2.1529E-01	-2.1529E-01	8.5753E-01	8.5762E-01	9.392E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (83.4 to 2000.7 keV) 1.3291437E+01 pCi/gm
Total Decayed Activity (83.4 to 2000.7 keV) 1.3291439E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
DAT

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 103F_25JUL2006_1739.An1

Sample description
FSS-OOL-05-05-010-F

Spectrum Filename: C:\GammaVision\Spectra\103F_25JUL2006_1739.An1

Acquisition information
Start time: 25-Jul-2006 17:39:50
Live time: 2000
Real time: 2001
Dead time: 0.06 %
Detector ID: 4

Detector system
Det 103 - DSPE-471

Calibration
Filename: D3_1LSa.Clb
Detector_103 1.0 Liter Sand Geometry

Energy Calibration
Created: 08-Aug-2005 11:09:41
Zero offset: 0.409 keV
Gain: 0.500 keV/channel
Quadratic: 1.092E-08 keV/channel^2

Efficiency Calibration
Created: 08-Aug-2005 11:11:25
Type: Polynomial
Uncertainty: 0.993 %
Coefficients: -0.264059 -5.138468 0.638383
-0.089199 0.005011 -0.000129

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.41keV)
Stop channel: 4000 (2000.67keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 1.8760E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.8760E+03) =
5.3305E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	24-Jul-2006 09:46:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	103_150K_05AUG05.Pbc 08-Aug-2005 12:54:15
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 9 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.2397

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
77.05	87.	30.53	0.69	1.009E-02	77.11	17.500	3.402E-01	PB212
					77.11	10.700	PBC<MDA	PB214
92.90	73.	38.91	1.44	1.649E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
					94.67	15.500	PBC<MDA	PA234
186.28	116.	25.35	1.17	2.566E-02	185.99	3.280	8.817E-01	RA226
238.99	325.	7.29	1.09	2.318E-02	238.63	43.100	2.255E-01	PB212
242.05	73.	26.21	1.10	2.301E-02	241.00	3.900	5.865E-01	RA224
					241.92	7.470	3.069E-01	PB214
295.48	118.	14.81	1.08	2.024E-02	295.22	19.200	2.109E-01	PB214
338.44	50.	36.19	0.77	1.830E-02	338.40	12.010	PBC<MDA	AC228
352.10	198.	11.07	1.26	1.775E-02	351.99	37.100	2.106E-01	PB214
463.28	34.	35.85	1.61	1.425E-02				
463.28	34.	35.85	1.61	1.425E-02	463.51	10.000	PBC<MDA	SB125
511.18	105.	19.35	2.42	1.316E-02	510.72	22.500	1.911E-01	TL208
583.26	119.	14.09	1.51	1.184E-02	583.14	86.000	8.111E-02	TL208
609.68	156.	10.06	1.35	1.143E-02	604.66	97.600	1.003E-01	CS134
					609.32	46.090	2.046E-01	BI214
911.45	97.	14.46	1.73	8.399E-03	911.07	29.000	2.762E-01	AC228
969.42	37.	26.57	1.54	8.026E-03	968.90	17.460	1.906E-01	AC228
1120.57	68.	20.25	1.31	7.210E-03	1120.28	15.040	4.364E-01	BI214
1461.22	708.	3.82	1.97	5.931E-03	1460.75	10.700	7.820E+00	K40
1764.90	28.	17.96	0.98	5.142E-03	1764.51	15.920	2.440E-01	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
153.28	77.05	278.	87.	0.043	91.59	0.688	PB-214	l
483.26	242.05	148.	73.	0.037	78.63	1.095	PB-214	lD
1021.47	511.18	139.	50.	0.025	108.40	2.417	TL-208	s

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
RA-226	371.47	186.15	347.	77.	0.039	91.56	1.500s
PB-212	477.26	239.05	321.	336.	0.168	29.68	1.033
PB-214	590.10	295.48	93.	114.	0.057	44.44	1.082
AC-228	675.87	338.36	129.	44.	0.022	115.02	1.500
PB-214	703.35	352.10	114.	193.	0.096	33.20	1.263
SB-125	925.59	463.23	64.	38.	0.019	98.44	1.500s
TL-208	1021.39	511.14	90.	43.	0.021	60.47	1.500s
TL-208	1165.80	583.35	45.	108.	0.054	37.16	1.500
BI-214	1218.47	609.68	44.	150.	0.075	30.18	1.350
AC-228	1821.88	911.43	35.	82.	0.041	42.95	1.505
AC-228	1937.86	969.42	30.	37.	0.019	79.72	1.541s
BI-214	2240.11	1120.57	34.	66.	0.033	60.76	1.312s
K-40	2921.31	1461.22	26.	689.	0.345	11.47	1.965
BI-214	3528.56	1764.90	3.	28.	0.014	53.88	0.975s

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

Nuclide Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	Peak MDA Value pCi/gm	COMMENTS
BE-7		4.9474E-02					
			477.56	4.947E-02	%(	1.672E-01	4.92E-02 G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
K-40	7.8202E+00						
		1460.75	7.820E+00	(P	3.000E-01	3.07E-01	G
MN-54	-3.6266E-04						
		834.81	-3.627E-04	%(P	2.086E-02	5.63E-03	G
CO-57	1.5589E-03						
		122.07	1.559E-03	%(P	2.622E-02	7.69E-03	G K
		136.43	1.269E-02	&	2.150E-01	6.33E-02	G
CO-60	-1.0116E-02						
		1332.51	-1.012E-02	%(P	3.246E-02	8.99E-03	G K
		1173.23	5.300E-03	& P	3.405E-02	9.66E-03	G K
Sr-85	-7.9830E-03						
		514.00	-7.983E-03	%(	2.936E-02	8.71E-03	G
Kr-85	-1.8170E+02						
		513.99	-1.817E+02	%(	6.683E+02	1.98E+02	G
Y-88	-9.2370E-05						
		1836.01	-9.237E-05	&(P	3.226E-02	8.57E-03	G K
		898.02	-8.650E-04	& P	2.715E-02	7.44E-03	G
NB-94	2.9397E-03						
		871.10	2.940E-03	%(	2.338E-02	6.60E-03	G K
		702.50	3.822E-04	%	1.927E-02	5.29E-03	G K
Ag-108M	1.1560E-03						
		722.95	1.156E-03	%(	2.667E-02	7.50E-03	G K
		614.37	-1.005E-02	& P	3.065E-02	9.11E-03	G
		433.93	6.801E-03	%	1.821E-02	5.43E-03	G
CD-109	3.6909E-01						
		88.04	3.691E-01	%(	1.285E+00	3.86E-01	G
SN-113	2.7412E-03						
		391.71	2.741E-03	%(	3.055E-02	8.81E-03	G K
		255.04	-2.652E-01	%	1.177E+00	3.50E-01	G
SB-125	6.1761E-02						
		427.95	1.792E-02	&(P	6.671E-02	1.97E-02	G K
		600.77	4.230E-02	% P	1.072E-01	3.21E-02	G
		636.15	-2.446E-02	% P	1.665E-01	4.66E-02	G
		463.51	1.915E-01	(P	2.025E-01	6.50E-02	G
		176.29	-1.468E-01	&	3.842E-01	1.16E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
I-131	-4.5278E-03						
		364.48	-4.528E-03	%(P	2.674E-02	7.77E-03	G K
		636.97	2.491E-02	%	2.602E-01	7.24E-02	G
		284.29	8.109E-02	& P	3.700E-01	1.09E-01	G
CS-134	-7.9672E-04						
		604.66	-7.967E-04	&(	2.586E-02	7.35E-03	G K
		795.76	1.697E-02	% P	2.898E-02	8.95E-03	G
		569.29	2.401E-02	% P	1.512E-01	4.35E-02	G
		801.84	-2.222E-02	% P	2.552E-01	6.87E-02	G
CS-137	5.6273E-03						
		661.62	5.627E-03	%(P	2.137E-02	6.13E-03	G
CE-139	4.4640E-03						
		165.85	4.464E-03	%(	2.918E-02	8.66E-03	G
EU-152	-1.7293E-02						
		121.78	-1.729E-02	%(P	9.257E-02	2.75E-02	G K
		344.30	-1.283E-02	% P	8.347E-02	2.45E-02	G
		1408.08	3.374E-03	&	9.695E-02	2.52E-02	G
		964.00	-2.853E-02	& P	2.001E-01	5.67E-02	G
		1112.07	8.158E-02	%	2.149E-01	6.41E-02	G
		778.90	6.101E-02	&	1.484E-01	4.44E-02	G
EU-154	-6.7402E-03						
		123.10	-6.740E-03	%(	7.387E-02	2.19E-02	G K
		1274.80	1.878E-02	%	7.623E-02	2.20E-02	G
		723.30	2.939E-03	%	1.302E-01	3.66E-02	G
		1004.80	-1.256E-02	&	1.607E-01	4.52E-02	G
EU-155	5.4484E-02						
		86.45	5.448E-02	%(	1.497E-01	4.51E-02	G K
		105.31	-3.112E-02	&	1.428E-01	4.26E-02	G
HG-203	5.8155E-05						
		279.17	5.816E-05	%(P	2.849E-02	8.29E-03	G K
		72.87	-2.066E-01	% P	1.490E+00	4.43E-01	G
		70.83	-8.657E-01	%	2.987E+00	8.97E-01	G
		82.50	-4.903E-01	&	2.601E+00	7.76E-01	G
TL-208	8.2085E-02						
		583.14	7.639E-02	(P	2.400E-02	9.84E-03	G
		510.72	1.039E-01	*(P	1.139E-01	3.40E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
PB-212	2.5648E-01						
		238.63	2.418E-01	(P	6.214E-02	2.48E-02	G K
							Energy duplication
		77.11	1.465E-01	} P	3.215E-01	8.38E-02	G
		74.81	2.723E-01	% P	8.220E-01	2.47E-01	G
PB-214	2.1072E-01						
		351.99	2.106E-01	(P	5.749E-02	2.40E-02	G K
		295.22	2.109E-01	(P	8.836E-02	3.24E-02	G
							Energy duplication
		77.11	1.801E-01	} P	6.684E-01	1.38E-01	G
		241.92	2.179E-01	%	3.855E-01	1.18E-01	G
BI-212	4.1904E-02						
		727.17	4.190E-02	&(P	1.747E-01	5.04E-02	G K
		1620.56	-4.687E-02	& P	7.667E-01	1.98E-01	G
		785.42	1.535E-01	%	1.083E+00	3.07E-01	G
BI-214	2.1469E-01						
		609.32	2.046E-01	(P	4.607E-02	2.15E-02	G K
		1764.51	2.440E-01	(P	9.803E-02	4.90E-02	G
		1120.28	4.364E-01	+ P	1.992E-01	9.10E-02	G
RA-224	4.9929E-01						
		241.00	4.993E-01	&(	7.327E-01	2.25E-01	G
RA-226	6.6114E-01						
		185.99	6.611E-01	*(P	7.659E-01	2.36E-01	G
AC-228	2.2307E-01						
		911.07	2.426E-01	(P	9.002E-02	3.62E-02	G K
		968.90	1.906E-01	@(P	1.462E-01	5.09E-02	G
		338.40	1.450E-01	- P	1.826E-01	5.70E-02	G
TH-227	-1.1454E-01						
		236.00	-1.145E-01	%(	2.759E-01	8.34E-02	G K
		256.25	-4.653E-02	% P	3.219E-01	9.49E-02	G
PA-234	4.1288E-02						
		98.44	4.129E-02	%(P	1.464E-01	4.39E-02	G K
		946.00	1.024E-02	% P	1.543E-01	4.37E-02	G
		131.28	-2.270E-02	% P	1.495E-01	4.45E-02	G
		94.67	-3.012E-02	& P	2.680E-01	7.96E-02	G
		883.24	1.053E-02	%	1.940E-01	5.38E-02	G
		926.70	-1.660E-02	&	2.115E-01	5.88E-02	G
		569.26	3.554E-02	% P	2.241E-01	6.45E-02	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments

TH-234      -6.9407E-01
                           63.29-6.941E-01 %(P 4.541E+00 1.34E+00 G K
                           92.80 8.782E-01 % P 1.431E+00 4.33E-01 G
                           92.38 1.159E+00 % P 1.746E+00 5.30E-01 G

AM-241       1.5007E-01
                           59.54 1.501E-01 %(P 7.714E-01 2.30E-01 G
   ( - This peak used in the nuclide activity average.

   * - Peak is too wide, but only one peak in library.
   ! - Peak is part of a multiplet and this area went
       negative during deconvolution.
   ? - Peak is too narrow.
   @ - Peak is too wide at FW25M, but ok at FWHM.
   % - Peak fails sensitivity test.
   $ - Peak identified, but first peak of this nuclide
       failed one or more qualification tests.
   + - Peak activity higher than counting uncertainty range.
   - - Peak activity lower than counting uncertainty range.
   = - Peak outside analysis energy range.
   & - Calculated peak centroid is not close enough to the
       library energy centroid for positive identification.
   P - Peakbackground subtraction
   } - Peak is too close to another for the activity
       to be found directly.

   Nuclide Codes:                      Peak Codes:
   T - Thermal Neutron Activation      G - Gamma Ray
   F - Fast Neutron Activation         X - X-Ray
   I - Fission Product                 P - Positron Decay
   N - Naturally Occurring Isotope     S - Single-Escape
   P - Photon Reaction                 D - Double-Escape
   C - Charged Particle Reaction       K - Key Line
   M - No MDA Calculation              A - Not in Average
   R - Coincidence Corrected           C - Coincidence Peak
   H - Halflife limit exceeded

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
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***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	4.8628E-02	4.9474E-02	1.4753E-01	1.4756E-01	1.643E-01
K-40		7.8202E+00	7.8202E+00	9.2132E-01	1.0271E+00	
MN-54	#A	-3.6159E-04	-3.6266E-04	1.4769E-01	1.4769E-01	2.080E-02
CO-57	#B	1.5536E-03	1.5589E-03	2.3081E-02	2.3082E-02	2.613E-02
CO-60	#B	-1.0112E-02	-1.0116E-02	4.9752E-02	4.9755E-02	3.245E-02
Sr-85	#A	-7.8704E-03	-7.9830E-03	2.6130E-02	2.6134E-02	2.895E-02

Kr-85	#A	-1.8169E+02	-1.8170E+02	5.9472E+02	5.9481E+02	6.683E+02
Y-88	#B	-9.1575E-05	-9.2370E-05	3.2372E-03	3.2372E-03	3.198E-02
NB-94	#B	2.9397E-03	2.9397E-03	1.9802E-02	1.9803E-02	2.338E-02
Ag-108M	#B	1.1560E-03	1.1560E-03	2.2508E-02	2.2508E-02	2.667E-02
CD-109	#A	3.6835E-01	3.6909E-01	1.1569E+00	1.1571E+00	1.283E+00
SN-113	#B	2.7193E-03	2.7412E-03	2.6430E-02	2.6431E-02	3.031E-02
SB-125	#B	6.1705E-02	6.1761E-02	6.2844E-02	6.2946E-02	6.665E-02
I-131	#B	-4.0376E-03	-4.5278E-03	2.7738E-02	2.7739E-02	2.384E-02
CS-134	#B	-7.9575E-04	-7.9672E-04	2.2060E-02	2.2060E-02	2.582E-02
CS-137	#A	5.6268E-03	5.6273E-03	1.8400E-02	1.8403E-02	2.137E-02
CE-139	#A	4.4342E-03	4.4640E-03	2.5982E-02	2.5984E-02	2.899E-02
EU-152	#B	-1.7289E-02	-1.7293E-02	9.2687E-02	9.2692E-02	9.255E-02
EU-154	#B	-6.7382E-03	-6.7402E-03	6.5742E-02	6.5743E-02	7.385E-02
EU-155	#B	5.4456E-02	5.4484E-02	1.3526E-01	1.3529E-01	1.496E-01
HG-203	#B	5.7017E-05	5.8155E-05	2.4885E-02	2.4885E-02	2.793E-02
TL-208	#	8.2085E-02	8.2085E-02	3.1717E-02	3.2073E-02	2.400E-02
PB-212		2.5648E-01	2.5648E-01	7.8849E-02	8.0242E-02	
PB-214		2.1072E-01	2.1072E-01	6.0392E-02	6.1619E-02	
BI-212	#B	4.1904E-02	4.1904E-02	1.5120E-01	1.5122E-01	1.747E-01
BI-214		2.1469E-01	2.1469E-01	6.7595E-02	6.8734E-02	
RA-224	#A	4.9929E-01	4.9929E-01	6.7453E-01	6.7515E-01	7.327E-01
RA-226	#A	6.6114E-01	6.6114E-01	7.0682E-01	7.0786E-01	7.659E-01
AC-228	#	2.2307E-01	2.2307E-01	9.9738E-02	1.0058E-01	9.002E-02
TH-227	#B	-1.1454E-01	-1.1454E-01	2.5017E-01	2.5025E-01	2.759E-01
PA-234	#B	4.1288E-02	4.1288E-02	1.3155E-01	1.3157E-01	1.464E-01
TH-234	#B	-6.9407E-01	-6.9407E-01	8.5067E+00	8.5068E+00	4.541E+00
AM-241	#A	1.5007E-01	1.5007E-01	6.8915E-01	6.8920E-01	7.714E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (50.4 to 2000.7 keV) 8.5021152E+00 pCi/gm
Total Decayed Activity (50.4 to 2000.7 keV) 8.5021152E+00 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
DAT

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 103F_25JUL2006_1816.An1

Sample description
FSS-OOL-05-05-019-F

Spectrum Filename: C:\GammaVision\Spectra\103F_25JUL2006_1816.An1

Acquisition information
Start time: 25-Jul-2006 18:16:10
Live time: 2000
Real time: 2002
Dead time: 0.08 %
Detector ID: 4

Detector system
Det 103 - DSPE-471

Calibration
Filename: D3_1LSa.Clb
Detector_103 1.0 Liter Sand Geometry

Energy Calibration
Created: 08-Aug-2005 11:09:41
Zero offset: 0.409 keV
Gain: 0.500 keV/channel
Quadratic: 1.092E-08 keV/channel^2

Efficiency Calibration
Created: 08-Aug-2005 11:11:25
Type: Polynomial
Uncertainty: 0.993 %
Coefficients: -0.264059 -5.138468 0.638383
-0.089199 0.005011 -0.000129

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.41keV)
Stop channel: 4000 (2000.67keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 1.9980E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.9980E+03) =
5.0050E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	24-Jul-2006 07:35:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	103_150K_05AUG05.Pbc 08-Aug-2005 12:54:15
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 15 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.1666

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
74.90	108.	21.56	0.99	9.052E-03	74.81	9.600	8.393E-01	PB212
77.20	114.	16.85	0.99	1.011E-02	77.11	17.500	5.355E-01	PB212
					77.11	10.700	8.759E-01	PB214
93.09	89.	37.66	1.50	1.708E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
					94.67	15.500	PBC<MDA	PA234
185.78	140.	25.65	1.16	2.567E-02				
185.78	140.	25.65	1.16	2.567E-02	185.99	3.280	1.025E+00	RA226
209.32	63.	39.68	0.74	2.471E-02				
238.98	686.	4.75	1.09	2.318E-02	238.63	43.100	4.560E-01	PB212
242.11	104.	22.85	1.10	2.301E-02	241.00	3.900	7.789E-01	RA224
					241.92	7.470	4.075E-01	PB214
295.47	184.	11.13	1.13	2.024E-02	295.22	19.200	3.127E-01	PB214
300.18	63.	26.60	1.13	2.001E-02				
327.78	78.	30.21	1.17	1.875E-02				
338.52	175.	14.71	0.98	1.830E-02	338.40	12.010	5.345E-01	AC228
351.96	335.	8.24	1.30	1.775E-02	351.99	37.100	3.381E-01	PB214
510.76	143.	15.78	1.97	1.317E-02	510.72	22.500	2.655E-01	TL208
583.31	266.	9.64	1.14	1.184E-02	583.14	86.000	1.740E-01	TL208
609.50	221.	9.53	1.62	1.144E-02	609.32	46.090	2.749E-01	BI214
727.35	51.	24.54	1.46	9.963E-03	727.17	11.800	2.905E-01	BI212
911.52	162.	12.40	1.69	8.398E-03	911.07	29.000	4.415E-01	AC228
968.60	155.	15.08	1.62	8.028E-03	968.90	17.460	7.455E-01	AC228
1119.98	96.	21.99	2.81	7.212E-03	1120.28	15.040	5.968E-01	BI214
1461.24	1126.	3.09	2.00	5.931E-03	1460.75	10.700	1.180E+01	K40
1764.90	39.	19.36	0.72	5.141E-03	1764.51	15.920	2.952E-01	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide
417.79	209.32	281.	63.	0.032	119.05	0.738	AC-228
599.36	300.10	175.	73.	0.036	91.25	1.038	PB-212
654.70	327.78	186.	78.	0.039	90.63	1.170	AC-228 s

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-212	148.79	74.81	234.	108.	0.054	64.67	0.993D
PB-212	153.39	77.11	226.	114.	0.057	50.54	0.995A
PA-234	185.36	93.09	527.	89.	0.045	112.99	1.500s
RA-226	371.46	186.15	576.	123.	0.061	78.62	1.500s
PB-212	477.14	238.99	479.	705.	0.352	18.63	0.894
RA-224	482.83	241.84	564.	88.	0.044	118.36	1.500
PB-214	589.94	295.40	156.	172.	0.086	37.88	1.152
AC-228	676.18	338.52	188.	174.	0.087	44.14	0.985
PB-214	703.07	351.96	164.	329.	0.165	24.72	1.303
TL-208	1020.64	510.76	149.	116.	0.058	47.33	1.969s
TL-208	1165.72	583.31	108.	262.	0.131	28.93	1.141
BI-214	1218.09	609.50	86.	214.	0.107	28.58	1.621s
BI-212	1453.77	727.35	48.	51.	0.025	73.61	1.461
AC-228	1822.07	911.52	71.	159.	0.080	37.21	1.687s
AC-228	1936.22	968.60	89.	154.	0.077	45.24	1.624s
BI-214	2238.93	1119.98	88.	96.	0.048	65.96	2.815s
K-40	2921.36	1461.24	38.	1107.	0.554	9.26	1.998
BI-214	3528.56	1764.90	9.	36.	0.018	58.08	0.720s

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	MDA Value pCi/gm	COMMENTS
BE-7		-3.4299E-03					
			477.56	-3.430E-03	&(	2.514E-01	7.24E-02 G
K-40		1.1797E+01					
			1460.75	1.180E+01	(P	3.347E-01	3.70E-01 G
MN-54		1.6759E-02					
			834.81	1.676E-02	%(P	2.817E-02	8.68E-03 G
CO-57		4.5522E-03					
			122.07	4.552E-03	&(P	4.196E-02	1.25E-02 G K
			136.43	-4.382E-02	&	3.162E-01	9.44E-02 G
CO-60		-3.0279E-03					
			1332.51	-3.028E-03	&(P	2.974E-02	7.79E-03 G K
			1173.23	-8.242E-03	% P	4.326E-02	1.24E-02 G K
Sr-85		-1.6405E-02					
			514.00	-1.640E-02	%(	3.681E-02	1.11E-02 G
Kr-85		-3.7293E+02					
			513.99	-3.729E+02	%(	8.368E+02	2.53E+02 G
Y-88		3.9584E-06					
			1836.01	3.958E-06	&(P	2.320E-02	5.90E-03 G K
			898.02	-6.414E-03	% P	3.477E-02	1.01E-02 G
NB-94		7.4088E-03					
			871.10	7.409E-03	%(	2.259E-02	6.66E-03 G K
			702.50	7.040E-03	%	2.828E-02	8.32E-03 G K
Ag-108M		0.0000E+00					
			722.95	0.000E+00	%(	4.970E-02	1.45E-02 G K
			614.37	-6.275E-03	% P	3.222E-02	9.45E-03 G
			433.93	-4.162E-03	%	2.970E-02	8.72E-03 G
CD-109		9.9893E-01					
			88.04	9.989E-01	%(	1.490E+00	4.56E-01 G
SN-113		-2.8794E-03					
			391.71	-2.879E-03	%(	3.994E-02	1.17E-02 G K
			255.04	2.974E-01	%	9.791E-01	2.93E-01 G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	-2.0320E-02						
		427.95	-2.032E-02	%(P	8.686E-02	2.57E-02	G K
		600.77	-4.514E-05	% P	1.338E-01	3.80E-02	G
		636.15	-2.022E-02	& P	2.322E-01	6.64E-02	G
		463.51	1.495E-01	% P	2.468E-01	7.56E-02	G
		176.29	-8.213E-02	&	4.645E-01	1.39E-01	G
I-131	1.7973E-03						
		364.48	1.797E-03	&(P	3.484E-02	1.02E-02	G K
		636.97	-5.949E-04	%	2.980E-01	8.26E-02	G
		284.29	-3.506E-02	% P	4.931E-01	1.45E-01	G
CS-134	-7.8437E-03						
		604.66	-7.844E-03	&(	3.120E-02	9.23E-03	G K
		795.76	1.962E-02	% P	2.875E-02	9.00E-03	G
		569.29	3.813E-02	% P	1.255E-01	3.67E-02	G
		801.84	-9.742E-02	& P	2.931E-01	8.49E-02	G
CS-137	1.6029E-02						
		661.62	1.603E-02	%(P	3.067E-02	9.32E-03	G
CE-139	-3.8128E-03						
		165.85	-3.813E-03	&(	3.773E-02	1.12E-02	G
EU-152	1.2406E-02						
		121.78	1.241E-02	&(P	1.227E-01	3.66E-02	G K
		344.30	-4.259E-03	% P	9.342E-02	2.73E-02	G
		1408.08	3.575E-03	%	9.527E-02	2.50E-02	G
		964.00	1.157E-01	% P	2.066E-01	6.33E-02	G
		1112.07	-4.630E-02	%	2.868E-01	8.33E-02	G
		778.90	4.481E-04	%	1.785E-01	4.97E-02	G
EU-154	-3.2623E-03						
		123.10	-3.262E-03	%(	7.582E-02	2.25E-02	G K
		1274.80	3.677E-02	%	8.511E-02	2.56E-02	G
		723.30	-5.021E-02	%	1.739E-01	5.16E-02	G
		1004.80	-4.447E-02	%	1.764E-01	5.17E-02	G
EU-155	1.1380E-01						
		86.45	1.138E-01	%(	1.913E-01	5.83E-02	G K
		105.31	5.639E-03	&	1.859E-01	5.52E-02	G
HG-203	5.8003E-03						
		279.17	5.800E-03	%(P	3.309E-02	9.83E-03	G K
		72.87	-2.712E-01	% P	1.766E+00	5.28E-01	G
		70.83	1.279E-02	&	3.121E+00	9.25E-01	G
		82.50	-9.713E-03	%	3.078E+00	9.14E-01	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments

TL-208       1.7402E-01
                          583.14 1.740E-01  (P 3.394E-02 1.71E-02 G
                          510.72 2.655E-01 + P 1.358E-01 5.15E-02 G

PB-212       4.9361E-01
                          238.63 4.766E-01  (P 7.086E-02 3.01E-02 G K
                                                          Energy duplication
                           77.11 4.362E-01 } P 2.780E-01 7.35E-02 G
                           74.81 8.393E-01 + P 5.754E-01 1.86E-01 G

PB-214       3.2494E-01
                          351.99 3.381E-01  (P 6.402E-02 2.83E-02 G K
                          295.22 2.995E-01  (P 1.059E-01 3.87E-02 G
                                                          Energy duplication
                           77.11 0.000E+00 } P 6.642E-01 0.00E+00 G
                          241.92 2.630E-01 %   4.468E-01 1.36E-01 G

BI-212       2.9051E-01
                          727.17 2.905E-01  (P 2.023E-01 7.20E-02 G K
                         1620.56 1.471E-01 % P 6.789E-01 1.87E-01 G
                          785.42 3.530E-01 %   1.199E+00 3.53E-01 G

BI-214       2.8015E-01
                          609.32 2.749E-01 @(P 5.881E-02 2.70E-02 G K
                         1764.51 2.952E-01  (P 1.396E-01 6.24E-02 G
                         1120.28 5.968E-01 + P 2.899E-01 1.34E-01 G

RA-224       6.6450E-01
                          241.00 6.645E-01 &(  8.523E-01 2.62E-01 G

RA-226       9.8453E-01
                          185.99 9.845E-01 *(P 9.201E-01 2.85E-01 G

AC-228       4.6873E-01
                          911.07 4.415E-01 *(P 1.165E-01 5.59E-02 G K
                          968.90 7.455E-01 + P 2.247E-01 1.13E-01 G
                          338.40 5.345E-01  (P 2.051E-01 7.92E-02 G

TH-227       2.7542E-03
                          236.00 2.754E-03 &(  4.057E-01 1.21E-01 G K
                          256.25 6.829E-02 % P 3.618E-01 1.08E-01 G

PA-234       7.9911E-02
                           98.44-1.176E-02 %(P 1.614E-01 4.79E-02 G K
                          946.00 1.321E-03 % P 1.652E-01 4.68E-02 G
                          131.28 5.387E-02 & P 1.767E-01 5.32E-02 G
                           94.67 2.284E-01  (P 2.801E-01 8.63E-02 G
                          883.24 2.519E-02 %   2.457E-01 7.03E-02 G
                          926.70-5.737E-02 %   2.519E-01 7.33E-02 G
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 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26 6.034E-02 % P 1.959E-01 5.75E-02 G

TH-234       1.2514E+00
                           63.29 1.251E+00 %(P 4.761E+00 1.42E+00 G K
                           92.80 8.577E-01 % P 1.754E+00 5.29E-01 G
                           92.38 9.646E-01 & P 2.099E+00 6.32E-01 G

AM-241      -1.7209E-01
                           59.54-1.721E-01 %(P 8.586E-01 2.56E-01 G
   ( - This peak used in the nuclide activity average.

   * - Peak is too wide, but only one peak in library.
   ! - Peak is part of a multiplet and this area went
       negative during deconvolution.
   ? - Peak is too narrow.
   @ - Peak is too wide at FW25M, but ok at FWHM.
   % - Peak fails sensitivity test.
   $ - Peak identified, but first peak of this nuclide
       failed one or more qualification tests.
   + - Peak activity higher than counting uncertainty range.
   - - Peak activity lower than counting uncertainty range.
   = - Peak outside analysis energy range.
   & - Calculated peak centroid is not close enough to the
       library energy centroid for positive identification.
   P - Peakbackground subtraction
   } - Peak is too close to another for the activity
       to be found directly.

   Nuclide Codes:                      Peak Codes:
   T - Thermal Neutron Activation      G - Gamma Ray
   F - Fast Neutron Activation         X - X-Ray
   I - Fission Product                 P - Positron Decay
   N - Naturally Occurring Isotope     S - Single-Escape
   P - Photon Reaction                 D - Double-Escape
   C - Charged Particle Reaction       K - Key Line
   M - No MDA Calculation              A - Not in Average
   R - Coincidence Corrected           C - Coincidence Peak
   H - Halflife limit exceeded

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
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***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	-3.3662E-03	-3.4299E-03	2.1731E-01	2.1731E-01	2.467E-01
K-40		1.1797E+01	1.1797E+01	1.1104E+00	1.3046E+00	
MN-54	#A	1.6705E-02	1.6759E-02	2.6037E-02	2.6055E-02	2.808E-02
CO-57	#B	4.5354E-03	4.5522E-03	3.7550E-02	3.7551E-02	4.181E-02
CO-60	#B	-3.0263E-03	-3.0279E-03	6.6151E-01	6.6151E-01	2.973E-02

Sr-85	#A	-1.6153E-02	-1.6405E-02	3.3399E-02	3.3413E-02	3.625E-02
Kr-85	#A	-3.7292E+02	-3.7293E+02	7.5924E+02	7.5955E+02	8.368E+02
Y-88	#B	3.9213E-06	3.9584E-06	1.7690E-02	1.7690E-02	2.298E-02
NB-94	#B	7.4088E-03	7.4088E-03	1.9989E-02	1.9994E-02	2.259E-02
Ag-108M	#B	0.0000E+00	0.0000E+00	4.3406E-02	4.3406E-02	4.970E-02
CD-109	#A	9.9672E-01	9.9893E-01	1.3670E+00	1.3681E+00	1.487E+00
SN-113	#B	-2.8545E-03	-2.8794E-03	3.5000E-02	3.5000E-02	3.960E-02
SB-125	#B	-2.0299E-02	-2.0320E-02	7.7588E-02	7.7597E-02	8.678E-02
I-131	#B	1.5867E-03	1.7973E-03	3.0485E-02	3.0485E-02	3.076E-02
CS-134	#B	-7.8333E-03	-7.8437E-03	2.7694E-02	2.7698E-02	3.115E-02
CS-137	#A	1.6028E-02	1.6029E-02	2.7948E-02	2.7964E-02	3.067E-02
CE-139	#A	-3.7852E-03	-3.8128E-03	3.3712E-02	3.3712E-02	3.746E-02
EU-152	#B	1.2403E-02	1.2406E-02	1.0976E-01	1.0976E-01	1.227E-01
EU-154	#B	-3.2613E-03	-3.2623E-03	6.7433E-02	6.7433E-02	7.579E-02
EU-155	#B	1.1374E-01	1.1380E-01	1.7493E-01	1.7504E-01	1.912E-01
HG-203	#B	5.6769E-03	5.8003E-03	2.9494E-02	2.9496E-02	3.239E-02
TL-208		1.7402E-01	1.7402E-01	5.1176E-02	5.2164E-02	
PB-212		4.9361E-01	4.9361E-01	9.3497E-02	9.7790E-02	
PB-214		3.2494E-01	3.2494E-01	7.5084E-02	7.7418E-02	
BI-212		2.9051E-01	2.9051E-01	2.1594E-01	2.1660E-01	
BI-214		2.8015E-01	2.8015E-01	8.2493E-02	8.4081E-02	
RA-224	#A	6.6450E-01	6.6450E-01	7.8654E-01	7.8748E-01	8.523E-01
RA-226	#	9.8453E-01	9.8453E-01	8.5590E-01	8.5781E-01	9.201E-01
AC-228		4.6873E-01	4.6873E-01	1.3700E-01	1.3968E-01	
TH-227	#B	2.7542E-03	2.7542E-03	3.6305E-01	3.6305E-01	4.057E-01
PA-234	#B	7.9911E-02	7.9911E-02	9.0638E-02	9.0746E-02	1.614E-01
TH-234	#B	1.2514E+00	1.2514E+00	4.2702E+00	4.2708E+00	4.761E+00
AM-241	#A	-1.7209E-01	-1.7209E-01	7.8425E-01	7.8431E-01	8.586E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (87.4 to 2000.7 keV) 1.3828822E+01 pCi/gm
Total Decayed Activity (87.4 to 2000.7 keV) 1.3828822E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
DAT

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 103F_25JUL2006_1852.An1

Sample description
FSS-OOL-05-05-003-F

Spectrum Filename: C:\GammaVision\Spectra\103F_25JUL2006_1852.An1

Acquisition information
Start time: 25-Jul-2006 18:52:43
Live time: 2000
Real time: 2002
Dead time: 0.10 %
Detector ID: 4

Detector system
Det 103 - DSPE-471

Calibration
Filename: D3_1LSa.Clb
Detector_103 1.0 Liter Sand Geometry

Energy Calibration
Created: 08-Aug-2005 11:09:41
Zero offset: 0.409 keV
Gain: 0.500 keV/channel
Quadratic: 1.092E-08 keV/channel^2

Efficiency Calibration
Created: 08-Aug-2005 11:11:25
Type: Polynomial
Uncertainty: 0.993 %
Coefficients: -0.264059 -5.138468 0.638383
-0.089199 0.005011 -0.000129

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.41keV)
Stop channel: 4000 (2000.67keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 1.9930E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.9930E+03) =
5.0176E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	24-Jul-2006 09:54:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	103_150K_05AUG05.Pbc 08-Aug-2005 12:54:15
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 16 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.2102

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
74.92	112.	24.05	0.99	9.052E-03	74.81	9.600	8.711E-01	PB212
77.22	154.	15.33	0.99	1.011E-02	77.11	17.500	7.428E-01	PB212
					77.11	10.700	1.215E+00	PB214
186.58	137.	27.82	1.12	2.565E-02	185.99	3.280	PBC<MDA	RA226
209.83	108.	27.13	1.11	2.469E-02				
238.98	1044.	3.75	1.09	2.318E-02	238.63	43.100	7.001E-01	PB212
241.67	124.	19.74	1.09	2.303E-02	241.00	3.900	9.307E-01	RA224
					241.92	7.470	4.869E-01	PB214
269.94	70.	37.35	0.87	2.153E-02				
295.42	227.	10.58	1.22	2.024E-02	295.22	19.200	3.888E-01	PB214
300.33	79.	30.28	1.26	2.000E-02				
327.72	73.	30.73	1.53	1.875E-02				
338.54	235.	12.14	1.07	1.830E-02	338.40	12.010	7.210E-01	AC228
351.99	382.	7.99	1.27	1.775E-02	351.99	37.100	3.872E-01	PB214
462.70	100.	23.16	1.95	1.427E-02				
462.70	100.	23.16	1.95	1.427E-02	463.51	10.000	4.698E-01	SB125
510.64	165.	14.45	1.51	1.317E-02	510.72	22.500	3.165E-01	TL208
583.36	368.	8.14	1.30	1.184E-02	583.14	86.000	2.420E-01	TL208
609.53	302.	6.59	1.32	1.144E-02	609.32	46.090	3.800E-01	BI214
727.34	108.	21.36	1.50	9.963E-03	727.17	11.800	6.228E-01	BI212
786.40	31.	36.32	1.50	9.394E-03	785.42	2.000	PBC<MDA	BI212
794.74	68.	24.83	0.99	9.310E-03				
794.74	68.	24.83	0.99	9.310E-03	795.76	85.400	5.779E-02	CS134
835.08	46.	35.52	1.83	8.968E-03	834.81	99.978	3.431E-02	MN54
899.03	24.	38.96	1.01	8.485E-03				
911.50	274.	8.51	1.82	8.398E-03	911.07	29.000	7.526E-01	AC228
964.49	43.	26.93	1.54	8.052E-03	964.00	14.580	PBC<MDA	EU152

969.30	122.	11.05	1.54	8.023E-03	968.90	17.460	5.874E-01	AC228
1121.00	85.	18.71	2.16	7.208E-03	1120.28	15.040	5.195E-01	BI214
1461.17	1367.	2.75	1.97	5.931E-03	1460.75	10.700	1.441E+01	K40
1765.06	68.	14.24	1.88	5.140E-03	1764.51	15.920	5.345E-01	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
418.83	209.83	355.	108.	0.054	81.39	1.111	NP-239	
539.03	269.94	277.	70.	0.035	112.05	0.870	AC-228	
599.80	300.33	213.	79.	0.039	90.83	1.260	PB-212	s
654.57	327.72	197.	73.	0.037	92.20	1.528	AC-228	s
1669.20	835.08	77.	46.	0.023	106.55	1.827	KR-88	l
1797.09	899.03	29.	26.	0.013	104.55	1.010	PA-234	s
1928.95	964.61	41.	48.	0.024	71.36	1.538	AC-228	D

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-212	148.79	74.81	326.	112.	0.056	72.16	0.993D
PB-212	153.39	77.11	344.	154.	0.077	46.00	0.995A
RA-226	371.79	186.31	730.	106.	0.053	99.66	1.500
PB-212	477.11	238.98	499.	1031.	0.515	13.68	0.955
RA-224	482.93	241.89	655.	119.	0.060	95.33	1.500
PB-214	482.66	241.75	662.	93.	0.047	121.22	1.500s
PB-214	589.99	295.42	179.	223.	0.111	31.75	1.220
AC-228	676.23	338.54	215.	234.	0.117	36.43	1.072s
PB-214	703.11	351.99	217.	376.	0.188	23.97	1.272
SB-125	924.90	462.89	139.	64.	0.032	84.57	1.500s
TL-208	1020.40	510.64	171.	138.	0.069	43.34	1.515s
TL-208	1165.82	583.36	147.	364.	0.182	24.43	1.298
BI-214	1218.28	609.59	106.	308.	0.154	23.67	1.112
BI-212	1453.75	727.34	123.	108.	0.054	64.09	1.497
BI-212	1571.85	786.40	49.	31.	0.016	108.96	1.500
CS-134	1589.74	795.34	55.	41.	0.021	89.10	1.500
AC-228	1822.03	911.50	83.	270.	0.135	25.53	1.824s
EU-152	1928.79	964.88	76.	40.	0.020	102.82	1.538
AC-228	1936.81	968.90	32.	122.	0.061	33.64	1.541D
BI-214	2240.98	1121.00	58.	83.	0.042	56.14	2.161s
K-40	2921.21	1461.17	33.	1349.	0.674	8.25	1.972
BI-214	3528.88	1765.06	9.	65.	0.032	42.72	1.883

s - Peak fails shape tests.
D - Peak area deconvoluted.

A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	MDA Value pCi/gm	COMMENTS
BE-7		3.5104E-02					
			477.56	3.510E-02	&(	2.862E-01 8.39E-02	G
K-40		1.4406E+01					
			1460.75	1.441E+01	(P	3.167E-01 4.02E-01	G
MN-54		2.2964E-02					
			834.81	2.296E-02	%(P	3.199E-02 9.99E-03	G
CO-57		-5.9486E-03					
			122.07	-5.949E-03	%(P	4.012E-02 1.20E-02	G K
			136.43	-2.406E-02	%	3.489E-01 1.04E-01	G
CO-60		-8.1259E-03					
			1332.51	-8.126E-03	%(P	3.552E-02 9.88E-03	G K
			1173.23	-1.383E-02	& P	4.613E-02 1.35E-02	G K
Sr-85		-1.5845E-02					
			514.00	-1.584E-02	&(	3.953E-02 1.19E-02	G
Kr-85		-3.6045E+02					
			513.99	-3.604E+02	&(	8.992E+02 2.71E+02	G
Y-88		-4.3655E-03					
			1836.01	-4.366E-03	%(P	2.591E-02 7.14E-03	G K
			898.02	-1.017E-02	% P	3.328E-02 9.78E-03	G
NB-94		-6.0111E-04					
			871.10	-6.011E-04	%(	3.177E-02 9.03E-03	G K
			702.50	2.014E-03	&	3.030E-02 8.73E-03	G K
Ag-108M		1.7436E-05					
			722.95	1.744E-05	&(	4.189E-02 1.21E-02	G K
			614.37	-8.098E-03	% P	3.750E-02 1.11E-02	G
			433.93	1.219E-02	&	2.558E-02 7.76E-03	G
CD-109		3.5377E-02					
			88.04	3.538E-02	%(	1.876E+00 5.60E-01	G
SN-113		1.5964E-02					
			391.71	1.596E-02	%(	4.096E-02 1.23E-02	G K
			255.04	-1.460E-01	%	1.458E+00 4.33E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	6.0613E-02						
		427.95	-2.216E-02	%(P	8.982E-02	2.66E-02	G K
		600.77	1.626E-02	& P	1.507E-01	4.37E-02	G
		636.15	-6.427E-02	% P	2.553E-01	7.50E-02	G
		463.51	3.056E-01	*(P	2.743E-01	8.79E-02	G
		176.29	-3.213E-02	&	5.096E-01	1.52E-01	G
I-131	8.2074E-03						
		364.48	8.207E-03	%(P	3.412E-02	1.01E-02	G K
		636.97	9.117E-02	%	3.472E-01	1.02E-01	G
		284.29	4.614E-02	% P	5.164E-01	1.53E-01	G
CS-134	2.4709E-02						
		604.66	1.545E-02	%(	2.479E-02	7.66E-03	G K
		795.76	3.529E-02	(P	3.183E-02	1.05E-02	G
		569.29	-3.381E-02	% P	1.991E-01	5.79E-02	G
		801.84	-9.403E-03	% P	2.835E-01	7.79E-02	G
CS-137	7.5956E-03						
		661.62	7.596E-03	%(P	3.391E-02	9.93E-03	G
CE-139	7.4058E-03						
		165.85	7.406E-03	&(	3.800E-02	1.14E-02	G
EU-152	7.8893E-02						
		121.78	3.319E-03	%(P	1.116E-01	3.31E-02	G K
		344.30	-2.612E-02	% P	1.001E-01	2.98E-02	G
		1408.08	3.805E-02	%	1.428E-01	4.15E-02	G
		964.00	2.305E-01	(P	2.509E-01	8.01E-02	G
		1112.07	8.903E-02	%	2.737E-01	8.13E-02	G
		778.90	-2.884E-02	&	2.320E-01	6.71E-02	G
EU-154	2.2668E-03						
		123.10	2.267E-03	%(	1.037E-01	3.09E-02	G K
		1274.80	-4.160E-03	&	1.190E-01	3.39E-02	G
		723.30	-4.063E-02	%	1.669E-01	4.93E-02	G
		1004.80	-3.195E-02	&	2.092E-01	6.07E-02	G
EU-155	1.5638E-02						
		86.45	1.564E-02	&(	2.242E-01	6.70E-02	G K
		105.31	5.004E-02	%	2.132E-01	6.40E-02	G
HG-203	2.2107E-02						
		279.17	2.211E-02	%(P	3.404E-02	1.04E-02	G K
		72.87	-3.312E-01	% P	2.038E+00	6.11E-01	G
		70.83	-6.046E-01	&	3.786E+00	1.13E+00	G
		82.50	-3.239E-01	&	3.536E+00	1.06E+00	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	2.4202E-01						
		583.14	2.420E-01	(P	3.946E-02	1.99E-02	G
		510.72	3.165E-01	+ P	1.455E-01	5.45E-02	G
PB-212	7.1154E-01						
		238.63	6.988E-01	(P	7.246E-02	3.23E-02	G K
							Energy duplication
		77.11	5.911E-01	} P	3.415E-01	9.06E-02	G
		74.81	8.711E-01	+ P	6.782E-01	2.15E-01	G
PB-214	3.8541E-01						
		351.99	3.872E-01	(P	7.343E-02	3.14E-02	G K
		295.22	3.888E-01	(P	1.135E-01	4.19E-02	G
							Energy duplication
		77.11	7.515E-02	} P	8.402E-01	1.97E-01	G
		241.92	3.674E-01	(	4.836E-01	1.48E-01	G
BI-212	6.2281E-01						
		727.17	6.228E-01	(P	3.136E-01	1.34E-01	G K
		1620.56	1.827E-01	% P	8.253E-01	2.32E-01	G
		785.42	1.134E+00	+	1.280E+00	4.12E-01	G
BI-214	3.9550E-01						
		609.32	3.955E-01	(P	6.532E-02	3.19E-02	G K
		1764.51	5.345E-01	+ P	1.412E-01	8.00E-02	G
		1120.28	5.195E-01	+ P	2.386E-01	9.95E-02	G
RA-224	8.9676E-01						
		241.00	8.968E-01	(	9.194E-01	2.85E-01	G
RA-226	8.5080E-01						
		185.99	8.508E-01	(P	1.036E+00	3.17E-01	G
AC-228	7.4335E-01						
		911.07	7.526E-01	@(P	1.254E-01	6.49E-02	G K
		968.90	5.882E-01	- P	1.415E-01	6.60E-02	G
		338.40	7.210E-01	@(P	2.193E-01	8.80E-02	G
TH-227	8.2915E-03						
		236.00	8.291E-03	&(	3.077E-01	9.14E-02	G K
		256.25	-6.023E-02	& P	4.324E-01	1.29E-01	G
PA-234	1.3618E-02						
		98.44	1.362E-02	&(P	1.865E-01	5.55E-02	G K
		946.00	-1.628E-03	% P	1.319E-01	3.67E-02	G
		131.28	-2.964E-02	& P	1.954E-01	5.85E-02	G
		94.67	-5.455E-02	% P	3.685E-01	1.10E-01	G
		883.24	4.988E-02	&	2.516E-01	7.32E-02	G
		926.70	-2.828E-02	%	2.647E-01	7.56E-02	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26-4.998E-02 % P 2.949E-01 8.58E-02 G

TH-234       7.1507E-01
                           63.29 7.151E-01 &(P 5.559E+00 1.66E+00 G K
                           92.80 9.925E-01 % P 2.015E+00 6.09E-01 G
                           92.38 9.584E-01 % P 2.401E+00 7.23E-01 G

AM-241      -1.0388E-01
                           59.54-1.039E-01 %(P 8.818E-01 2.62E-01 G
   ( - This peak used in the nuclide activity average.

   * - Peak is too wide, but only one peak in library.
   ! - Peak is part of a multiplet and this area went
       negative during deconvolution.
   ? - Peak is too narrow.
   @ - Peak is too wide at FW25M, but ok at FWHM.
   % - Peak fails sensitivity test.
   $ - Peak identified, but first peak of this nuclide
       failed one or more qualification tests.
   + - Peak activity higher than counting uncertainty range.
   - - Peak activity lower than counting uncertainty range.
   = - Peak outside analysis energy range.
   & - Calculated peak centroid is not close enough to the
       library energy centroid for positive identification.
   P - Peakbackground subtraction
   } - Peak is too close to another for the activity
       to be found directly.

   Nuclide Codes:                      Peak Codes:
   T - Thermal Neutron Activation      G - Gamma Ray
   F - Fast Neutron Activation         X - X-Ray
   I - Fission Product                 P - Positron Decay
   N - Naturally Occurring Isotope     S - Single-Escape
   P - Photon Reaction                 D - Double-Escape
   C - Charged Particle Reaction       K - Key Line
   M - No MDA Calculation              A - Not in Average
   R - Coincidence Corrected           C - Coincidence Peak
   H - Halflife limit exceeded

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
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***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	3.4484E-02	3.5104E-02	2.5174E-01	2.5174E-01	2.812E-01
K-40		1.4406E+01	1.4406E+01	1.2046E+00	1.4665E+00	
MN-54	#A	2.2894E-02	2.2964E-02	2.9960E-02	2.9990E-02	3.189E-02
CO-57	#B	-5.9277E-03	-5.9486E-03	3.7734E-02	3.7736E-02	3.998E-02
CO-60	#B	-8.1219E-03	-8.1259E-03	6.1302E-02	6.1304E-02	3.550E-02

Sr-85	#A	-1.5614E-02	-1.5845E-02	3.5753E-02	3.5765E-02	3.895E-02
Kr-85	#A	-3.6044E+02	-3.6045E+02	8.1336E+02	8.1363E+02	8.992E+02
Y-88	#B	-4.3267E-03	-4.3655E-03	2.2283E-02	2.2284E-02	2.568E-02
NB-94	#B	-6.0111E-04	-6.0111E-04	2.7081E-02	2.7081E-02	3.177E-02
Ag-108M	#B	1.7435E-05	1.7436E-05	3.6290E-02	3.6290E-02	4.189E-02
CD-109	#A	3.5302E-02	3.5377E-02	1.6789E+00	1.6789E+00	1.872E+00
SN-113	#B	1.5832E-02	1.5964E-02	3.6976E-02	3.6988E-02	4.063E-02
SB-125	#B	6.0556E-02	6.0613E-02	5.2276E-02	5.2394E-02	8.974E-02
I-131	#B	7.2905E-03	8.2074E-03	3.0361E-02	3.0365E-02	3.031E-02
CS-134	#B	2.4678E-02	2.4709E-02	2.1436E-02	2.1484E-02	2.476E-02
CS-137	#A	7.5949E-03	7.5956E-03	2.9778E-02	2.9781E-02	3.391E-02
CE-139	#A	7.3547E-03	7.4058E-03	3.4113E-02	3.4115E-02	3.774E-02
EU-152	#B	7.8876E-02	7.8893E-02	8.2228E-02	8.2344E-02	1.116E-01
EU-154	#B	2.2661E-03	2.2668E-03	9.2722E-02	9.2722E-02	1.036E-01
EU-155	#B	1.5629E-02	1.5638E-02	2.0104E-01	2.0104E-01	2.241E-01
HG-203	#B	2.1659E-02	2.2107E-02	3.1300E-02	3.1326E-02	3.335E-02
TL-208		2.4202E-01	2.4202E-01	5.9820E-02	6.1448E-02	
PB-212		7.1154E-01	7.1154E-01	9.8499E-02	1.0681E-01	
PB-214		3.8541E-01	3.8541E-01	9.3783E-02	9.6416E-02	
BI-212		6.2281E-01	6.2281E-01	4.0098E-01	4.0261E-01	
BI-214		3.9550E-01	3.9550E-01	9.5601E-02	9.8320E-02	
RA-224	A	8.9676E-01	8.9676E-01	8.5484E-01	8.5643E-01	9.194E-01
RA-226	#A	8.5080E-01	8.5080E-01	9.5187E-01	9.5315E-01	1.036E+00
AC-228		7.4335E-01	7.4335E-01	1.6656E-01	1.7206E-01	
TH-227	#B	8.2915E-03	8.2915E-03	2.7406E-01	2.7406E-01	3.077E-01
PA-234	#B	1.3618E-02	1.3618E-02	1.6663E-01	1.6663E-01	1.865E-01
TH-234	#B	7.1507E-01	7.1507E-01	4.9664E+00	4.9666E+00	5.559E+00
AM-241	#A	-1.0388E-01	-1.0388E-01	8.1250E-01	8.1252E-01	8.818E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (1120.0 to 2000.7 keV) 1.8403673E+01 pCi/gm
Total Decayed Activity (1120.0 to 2000.7 keV) 1.8403673E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
DAT

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 103F_25JUL2006_1932.An1

Sample description
FSS-OOL-05-05-003-F-RC

Spectrum Filename: C:\GammaVision\Spectra\103F_25JUL2006_1932.An1

Acquisition information
Start time: 25-Jul-2006 19:32:19
Live time: 2000
Real time: 2002
Dead time: 0.10 %
Detector ID: 4

Detector system
Det 103 - DSPE-471

Calibration
Filename: D3_1LSa.Clb
Detector_103 1.0 Liter Sand Geometry

Energy Calibration
Created: 08-Aug-2005 11:09:41
Zero offset: 0.409 keV
Gain: 0.500 keV/channel
Quadratic: 1.092E-08 keV/channel^2

Efficiency Calibration
Created: 08-Aug-2005 11:11:25
Type: Polynomial
Uncertainty: 0.993 %
Coefficients: -0.264059 -5.138468 0.638383
-0.089199 0.005011 -0.000129

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.41keV)
Stop channel: 4000 (2000.67keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 1.9930E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.9930E+03) =
5.0176E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	24-Jul-2006 09:54:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	103_150K_05AUG05.Pbc 08-Aug-2005 12:54:15
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 16 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.1730

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
74.63	122.	21.18	0.99	9.100E-03	74.81	9.600	9.240E-01	PB212
77.41	179.	16.12	0.99	1.038E-02	77.11	17.500	6.737E-01	PB212
					77.11	10.700	1.102E+00	PB214
93.01	100.	37.11	1.50	1.631E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
93.01	100.	36.99	1.50	1.645E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
186.00	143.	24.74	1.14	2.567E-02	185.99	3.280	PBC<MDA	RA226
209.33	124.	28.63	1.09	2.471E-02				
238.95	986.	3.86	1.09	2.318E-02	238.63	43.100	6.608E-01	PB212
241.78	143.	18.96	1.09	2.303E-02	241.00	3.900	1.077E+00	RA224
					241.92	7.470	5.637E-01	PB214
270.58	88.	36.82	0.98	2.149E-02				
277.52	62.	37.33	1.04	2.113E-02				
295.30	232.	13.14	0.99	2.024E-02	295.22	19.200	3.967E-01	PB214
300.57	89.	32.29	0.99	1.999E-02				
327.77	66.	34.97	1.12	1.875E-02				
338.45	233.	12.34	1.27	1.830E-02	338.40	12.010	7.145E-01	AC228
352.02	397.	7.49	1.32	1.775E-02	351.99	37.100	4.029E-01	PB214
410.31	52.	39.57	1.13	1.572E-02				
463.56	60.	29.18	1.05	1.425E-02	463.51	10.000	PBC<MDA	SB125
510.76	222.	13.39	1.81	1.317E-02	510.72	22.500	4.478E-01	TL208
583.28	319.	7.97	1.13	1.184E-02	583.14	86.000	2.095E-01	TL208
609.47	344.	9.40	1.34	1.144E-02	609.32	46.090	4.343E-01	BI214
720.33	34.	33.02	1.50	1.001E-02	723.30	19.700	PBC<MDA	EU154
727.54	86.	18.65	1.22	9.961E-03	727.17	11.800	4.902E-01	BI212
794.62	55.	32.83	1.49	9.311E-03				

794.62	55.	32.83	1.49	9.311E-03	795.76	85.400	4.711E-02	CS134
911.49	242.	7.84	1.57	8.398E-03	911.07	29.000	6.641E-01	AC228
969.07	174.	15.31	1.35	8.025E-03	968.90	17.460	8.403E-01	AC228
1120.57	88.	20.52	1.41	7.210E-03	1120.28	15.040	5.395E-01	BI214
1461.22	1415.	2.74	1.94	5.931E-03	1460.75	10.700	1.492E+01	K40
1765.08	50.	14.21	2.37	5.142E-03	1764.51	15.920	4.152E-01	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
417.81	209.33	470.	124.	0.062	85.90	1.091	AC-228	
540.31	270.58	366.	88.	0.044	110.45	0.982	AC-228	
554.19	277.52	212.	73.	0.036	92.08	1.039	NP-239	s
600.29	300.57	285.	89.	0.045	96.87	0.995	PB-212	s
654.67	327.77	193.	66.	0.033	104.91	1.121	AC-228	
819.75	410.31	146.	52.	0.026	118.70	1.125	EU-152	s

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-212	148.79	74.81	311.	131.	0.065	61.34	0.993D
PB-212	153.39	77.11	334.	163.	0.081	47.28	0.995A
RA-226	371.43	186.13	751.	112.	0.056	95.79	1.500
PB-212	477.10	238.97	555.	967.	0.483	14.64	1.011
RA-224	482.87	241.86	630.	149.	0.074	75.80	1.500
PB-214	482.89	241.87	625.	131.	0.065	85.22	1.500
PB-214	589.75	295.30	282.	227.	0.114	39.42	0.987
AC-228	676.05	338.45	220.	232.	0.116	37.03	1.268s
PB-214	703.19	352.02	201.	391.	0.196	22.47	1.317
SB-125	925.52	463.20	153.	50.	0.025	109.13	1.500
TL-208	1020.63	510.76	211.	196.	0.098	40.17	1.806s
TL-208	1165.67	583.28	121.	315.	0.157	23.91	1.130
BI-214	1218.03	609.47	191.	338.	0.169	28.19	1.336
EU-154	1439.74	720.33	45.	34.	0.017	99.05	1.500
BI-212	1454.16	727.54	68.	85.	0.043	55.95	1.221s
CS-134	1588.89	794.92	48.	39.	0.019	89.72	1.500
AC-228	1822.00	911.49	52.	239.	0.119	23.51	1.572
AC-228	1937.15	969.07	130.	174.	0.087	45.92	1.353
BI-214	2240.12	1120.57	77.	86.	0.043	61.56	1.410s
K-40	2921.30	1461.22	39.	1396.	0.698	8.21	1.937
BI-214	3528.92	1765.08	5.	50.	0.025	42.62	2.373

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	MDA Value pCi/gm	COMMENTS
BE-7		4.8352E-03					
			477.56	4.835E-03	%(	2.879E-01 8.35E-02	G
K-40		1.4918E+01					
			1460.75	1.492E+01	(P	3.379E-01 4.14E-01	G
MN-54		1.3335E-02					
			834.81	1.333E-02	%(P	3.323E-02 9.97E-03	G
CO-57		1.7600E-03					
			122.07	1.760E-03	%(P	4.568E-02 1.36E-02	G K
			136.43	-5.943E-02	&	3.673E-01 1.10E-01	G
CO-60		-5.4967E-03					
			1332.51	-5.497E-03	%(P	3.873E-02 1.07E-02	G K
			1173.23	-1.897E-03	% P	5.324E-02 1.52E-02	G K
Sr-85		-1.4102E-02					
			514.00	-1.410E-02	&(	4.109E-02 1.23E-02	G
Kr-85		-3.2131E+02					
			513.99	-3.213E+02	&(	9.345E+02 2.81E+02	G
Y-88		-8.6988E-05					
			1836.01	-8.699E-05	&(P	3.635E-02 9.88E-03	G K
			898.02	4.781E-03	% P	3.702E-02 1.07E-02	G
NB-94		1.4174E-03					
			871.10	1.417E-03	&(	3.372E-02 9.65E-03	G K
			702.50	7.525E-03	%	2.877E-02 8.48E-03	G K
Ag-108M		6.3902E-04					
			722.95	6.390E-04	&(	4.051E-02 1.17E-02	G K
			614.37	-7.357E-03	% P	4.045E-02 1.19E-02	G
			433.93	3.810E-03	%	2.748E-02 8.05E-03	G
CD-109		-3.8891E-02					
			88.04	-3.889E-02	&(	1.866E+00 5.57E-01	G
SN-113		-6.5060E-03					
			391.71	-6.506E-03	&(	4.785E-02 1.41E-02	G K
			255.04	3.471E-01	%	1.305E+00 3.90E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	6.0826E-02						
		427.95	1.303E-04	%(P	9.782E-02	2.84E-02	G K
		600.77	-2.981E-02	% P	1.727E-01	5.07E-02	G
		636.15	-9.482E-02	% P	2.642E-01	7.87E-02	G
		463.51	2.405E-01	(P	2.872E-01	8.97E-02	G
		176.29	-2.477E-03	%	5.031E-01	1.49E-01	G
I-131	-4.8478E-03						
		364.48	-4.848E-03	%(P	3.806E-02	1.12E-02	G K
		636.97	6.819E-02	&	4.052E-01	1.18E-01	G
		284.29	-4.025E-02	% P	5.338E-01	1.58E-01	G
CS-134	1.6160E-02						
		604.66	1.287E-03	%(	6.243E-02	1.85E-02	G K
		795.76	3.316E-02	(P	2.998E-02	9.94E-03	G
		569.29	-2.741E-02	% P	1.689E-01	4.86E-02	G
		801.84	-4.294E-02	% P	3.414E-01	9.68E-02	G
CS-137	5.8171E-03						
		661.62	5.817E-03	%(P	3.621E-02	1.05E-02	G
CE-139	-6.0372E-03						
		165.85	-6.037E-03	%(	4.118E-02	1.23E-02	G
EU-152	7.7615E-03						
		121.78	7.761E-03	%(P	1.333E-01	3.97E-02	G K
		344.30	4.433E-04	& P	1.027E-01	3.00E-02	G
		1408.08	2.077E-02	%	1.339E-01	3.78E-02	G
		964.00	1.543E-01	% P	2.683E-01	8.22E-02	G
		1112.07	3.037E-02	%	1.568E-01	4.43E-02	G
		778.90	3.522E-02	%	2.207E-01	6.40E-02	G
EU-154	3.8418E-02						
		123.10	4.542E-04	&(	9.851E-02	2.93E-02	G K
		1274.80	-6.459E-04	%	1.090E-01	3.07E-02	G
		723.30	1.164E-01	&(	1.174E-01	3.84E-02	G
		1004.80	-7.275E-02	%	2.132E-01	6.35E-02	G
EU-155	1.4739E-01						
		86.45	1.474E-01	%(	2.108E-01	6.45E-02	G K
		105.31	7.425E-03	%	2.156E-01	6.43E-02	G
HG-203	-5.7545E-03						
		279.17	-5.754E-03	&(P	3.875E-02	1.15E-02	G K
		72.87	-2.150E-01	% P	1.992E+00	5.96E-01	G
		70.83	-9.894E-01	%	3.913E+00	1.18E+00	G
		82.50	-1.027E+00	&	3.665E+00	1.10E+00	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	2.0947E-01						
		583.14	2.095E-01	(P	3.597E-02	1.69E-02	G
		510.72	4.478E-01	+ P	1.612E-01	6.82E-02	G
PB-212	6.7280E-01						
		238.63	6.556E-01	(P	7.630E-02	3.24E-02	G K
							Energy duplication
		77.11	6.232E-01	} P	3.368E-01	9.82E-02	G
		74.81	1.020E+00	+ P	6.619E-01	2.14E-01	G
PB-214	4.0078E-01						
		351.99	4.029E-01	(P	7.074E-02	3.06E-02	G K
		295.22	3.967E-01	(P	1.411E-01	5.31E-02	G
							Energy duplication
		77.11	8.726E-02	} P	7.797E-01	1.98E-01	G
		241.92	5.157E-01	+	4.699E-01	1.46E-01	G
BI-212	4.9019E-01						
		727.17	4.902E-01	(P	2.372E-01	9.20E-02	G K
		1620.56	2.237E-01	% P	8.841E-01	2.52E-01	G
		785.42	9.251E-01	%	1.542E+00	4.75E-01	G
BI-214	4.5092E-01						
		609.32	4.343E-01	(P	8.637E-02	4.16E-02	G K
		1764.51	4.152E-01	(P	1.076E-01	6.29E-02	G
		1120.28	5.395E-01	(P	2.721E-01	1.13E-01	G
RA-224	1.1195E+00						
		241.00	1.119E+00	(	9.019E-01	2.83E-01	G
RA-226	9.0532E-01						
		185.99	9.053E-01	(P	1.051E+00	3.22E-01	G
AC-228	6.7887E-01						
		911.07	6.641E-01	(P	1.014E-01	5.28E-02	G K
		968.90	8.403E-01	+ P	2.705E-01	1.29E-01	G
		338.40	7.145E-01	@(P	2.218E-01	8.86E-02	G
TH-227	2.7611E-02						
		236.00	2.761E-02	&(	4.652E-01	1.39E-01	G K
		256.25	1.758E-01	& P	4.186E-01	1.26E-01	G
PA-234	6.8257E-02						
		98.44	6.826E-02	%(P	2.033E-01	6.13E-02	G K
		946.00	-4.453E-02	% P	1.695E-01	4.99E-02	G
		131.28	3.622E-02	& P	1.889E-01	5.66E-02	G
		94.67	-1.395E-01	% P	3.915E-01	1.18E-01	G
		883.24	-3.609E-02	&	2.628E-01	7.59E-02	G
		926.70	7.054E-02	%	2.829E-01	8.30E-02	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26-4.088E-02 % P 2.500E-01 7.19E-02 G

TH-234       1.7995E+00
                           63.29 1.799E+00 %(P 5.895E+00 1.77E+00 G K
                           92.80 1.368E+00 % P 1.957E+00 5.96E-01 G
                           92.38 1.612E+00 % P 2.314E+00 7.04E-01 G

AM-241       6.7751E-02
                           59.54 6.775E-02 %(P 1.054E+00 3.14E-01 G
   ( - This peak used in the nuclide activity average.

   * - Peak is too wide, but only one peak in library.
   ! - Peak is part of a multiplet and this area went
       negative during deconvolution.
   ? - Peak is too narrow.
   @ - Peak is too wide at FW25M, but ok at FWHM.
   % - Peak fails sensitivity test.
   $ - Peak identified, but first peak of this nuclide
       failed one or more qualification tests.
   + - Peak activity higher than counting uncertainty range.
   - - Peak activity lower than counting uncertainty range.
   = - Peak outside analysis energy range.
   & - Calculated peak centroid is not close enough to the
       library energy centroid for positive identification.
   P - Peakbackground subtraction
   } - Peak is too close to another for the activity
       to be found directly.

   Nuclide Codes:                      Peak Codes:
   T - Thermal Neutron Activation      G - Gamma Ray
   F - Fast Neutron Activation         X - X-Ray
   I - Fission Product                 P - Positron Decay
   N - Naturally Occurring Isotope     S - Single-Escape
   P - Photon Reaction                 D - Double-Escape
   C - Charged Particle Reaction       K - Key Line
   M - No MDA Calculation              A - Not in Average
   R - Coincidence Corrected           C - Coincidence Peak
   H - Halflife limit exceeded

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
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***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	4.7481E-03	4.8352E-03	2.5061E-01	2.5061E-01	2.827E-01
K-40		1.4918E+01	1.4918E+01	1.2413E+00	1.5136E+00	
MN-54	#A	1.3293E-02	1.3335E-02	2.9916E-02	2.9926E-02	3.313E-02
CO-57	#B	1.7537E-03	1.7600E-03	4.0817E-02	4.0817E-02	4.552E-02
CO-60	#B	-5.4939E-03	-5.4967E-03	1.0039E-01	1.0039E-01	3.871E-02

Sr-85	#A	-1.3892E-02	-1.4102E-02	3.7022E-02	3.7031E-02	4.048E-02
Kr-85	#A	-3.2131E+02	-3.2131E+02	8.4207E+02	8.4228E+02	9.345E+02
Y-88	#B	-8.6199E-05	-8.6988E-05	3.7338E-03	3.7338E-03	3.602E-02
NB-94	#B	1.4174E-03	1.4174E-03	2.8950E-02	2.8950E-02	3.372E-02
Ag-108M	#B	6.3901E-04	6.3902E-04	3.5094E-02	3.5094E-02	4.051E-02
CD-109	#A	-3.8807E-02	-3.8891E-02	1.6704E+00	1.6704E+00	1.862E+00
SN-113	#B	-6.4513E-03	-6.5060E-03	4.2407E-02	4.2409E-02	4.745E-02
SB-125	#B	6.0768E-02	6.0826E-02	6.8055E-02	6.8146E-02	9.772E-02
I-131	#B	-4.2960E-03	-4.8478E-03	3.9173E-02	3.9174E-02	3.372E-02
CS-134	#B	1.6139E-02	1.6160E-02	1.4531E-02	1.4561E-02	6.234E-02
CS-137	#A	5.8166E-03	5.8171E-03	3.1638E-02	3.1640E-02	3.621E-02
CE-139	#A	-5.9947E-03	-6.0372E-03	3.6922E-02	3.6923E-02	4.089E-02
EU-152	#B	7.7598E-03	7.7615E-03	1.1919E-01	1.1919E-01	1.333E-01
EU-154	#B	3.8406E-02	3.8418E-02	3.8052E-02	3.8112E-02	9.848E-02
EU-155	#B	1.4731E-01	1.4739E-01	1.9338E-01	1.9355E-01	2.107E-01
HG-203	#B	-5.6357E-03	-5.7545E-03	3.4776E-02	3.4778E-02	3.795E-02
TL-208		2.0947E-01	2.0947E-01	5.0778E-02	5.2214E-02	
PB-212		6.7280E-01	6.7280E-01	9.9738E-02	1.0711E-01	
PB-214		4.0078E-01	4.0078E-01	9.1369E-02	9.4285E-02	
BI-212	#	4.9019E-01	4.9019E-01	2.7584E-01	2.7731E-01	
BI-214		4.5092E-01	4.5092E-01	1.2436E-01	1.2708E-01	
RA-224		1.1195E+00	1.1195E+00	8.4852E-01	8.5101E-01	9.019E-01
RA-226	#A	9.0532E-01	9.0532E-01	9.6714E-01	9.6856E-01	1.051E+00
AC-228		6.7887E-01	6.7887E-01	1.4998E-01	1.5507E-01	
TH-227	#B	2.7611E-02	2.7611E-02	4.1790E-01	4.1791E-01	4.652E-01
PA-234	#B	6.8257E-02	6.8257E-02	1.8385E-01	1.8389E-01	2.033E-01
TH-234	#B	1.7995E+00	1.7995E+00	5.3141E+00	5.3151E+00	5.895E+00
AM-241	#A	6.7751E-02	6.7751E-02	9.4201E-01	9.4201E-01	1.054E+00

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (86.4 to 2000.7 keV) 1.8940506E+01 pCi/gm
Total Decayed Activity (86.4 to 2000.7 keV) 1.8940506E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
DAT

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 103F_25JUL2006_2008.An1

Sample description
FSS-OOL-05-05-011-F

Spectrum Filename: C:\GammaVision\Spectra\103F_25JUL2006_2008.An1

Acquisition information
Start time: 25-Jul-2006 20:08:44
Live time: 2000
Real time: 2002
Dead time: 0.11 %
Detector ID: 4

Detector system
Det 103 - DSPE-471

Calibration
Filename: D3_1LSa.Clb
Detector_103 1.0 Liter Sand Geometry

Energy Calibration
Created: 08-Aug-2005 11:09:41
Zero offset: 0.409 keV
Gain: 0.500 keV/channel
Quadratic: 1.092E-08 keV/channel^2

Efficiency Calibration
Created: 08-Aug-2005 11:11:25
Type: Polynomial
Uncertainty: 0.993 %
Coefficients: -0.264059 -5.138468 0.638383
-0.089199 0.005011 -0.000129

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.41keV)
Stop channel: 4000 (2000.67keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 1.9940E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.9940E+03) =
5.0150E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	24-Jul-2006 10:05:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	103_150K_05AUG05.Pbc 08-Aug-2005 12:54:15
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 15 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.1803

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
74.95	78.	34.67	0.99	9.052E-03	74.81	9.600	PBC<MDA	PB212
76.92	283.	15.87	0.92	1.003E-02	77.11	10.700	1.755E+00	PB214
					77.11	17.500	1.073E+00	PB212
93.10	92.	41.33	1.50	1.631E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
93.11	92.	41.59	1.50	1.645E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
186.20	159.	24.95	1.68	2.566E-02	185.99	3.280	1.177E+00	RA226
209.64	94.	32.62	0.85	2.470E-02				
238.96	1148.	3.54	1.09	2.319E-02	238.63	43.100	7.703E-01	PB212
242.19	135.	19.13	1.10	2.301E-02	241.00	3.900	1.017E+00	RA224
					241.92	7.470	5.321E-01	PB214
270.87	114.	28.39	1.73	2.148E-02				
277.14	75.	31.49	1.20	2.115E-02				
295.39	262.	10.87	1.21	2.024E-02	295.22	19.200	4.490E-01	PB214
300.25	56.	39.12	0.95	2.001E-02				
327.56	68.	38.69	1.55	1.876E-02				
338.44	216.	12.97	1.31	1.830E-02	338.40	12.010	6.611E-01	AC228
352.08	388.	7.16	1.24	1.775E-02	351.99	37.100	3.937E-01	PB214
463.50	86.	27.74	1.44	1.425E-02				
463.50	86.	27.74	1.44	1.425E-02	463.51	10.000	4.020E-01	SB125
510.65	152.	17.25	1.13	1.317E-02	510.72	22.500	2.861E-01	TL208
583.32	365.	7.47	1.34	1.184E-02	583.14	86.000	2.400E-01	TL208
609.51	296.	6.99	1.45	1.144E-02	609.32	46.090	3.722E-01	BI214
727.70	122.	17.17	1.85	9.959E-03	727.17	11.800	7.003E-01	BI212
772.82	40.	40.97	0.84	9.511E-03				
795.11	40.	35.03	1.51	9.307E-03				

795.11	40.	35.03	1.51	9.307E-03	795.76	85.400	3.427E-02	CS134
860.83	45.	25.47	1.60	8.765E-03				
911.29	251.	8.03	1.33	8.400E-03	911.07	29.000	6.894E-01	AC228
965.08	51.	22.65	1.54	8.049E-03	964.00	14.580	PBC<MDA	EU152
969.16	162.	9.60	1.54	8.023E-03	968.90	17.460	7.827E-01	AC228
1119.95	102.	23.08	1.61	7.213E-03	1120.28	15.040	6.255E-01	BI214
1461.21	1349.	2.81	1.92	5.931E-03	1460.75	10.700	1.420E+01	K40
1620.98	25.	20.00	1.25	5.488E-03	1620.56	2.750	1.121E+00	BI212

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
1765.21	61.	13.67	1.04	5.140E-03	1764.51	15.920	4.763E-01	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
418.43	209.64	405.	94.	0.047	97.86	0.852	NP-239	
540.88	270.87	362.	114.	0.057	85.16	1.734	AC-228	s
599.65	300.25	212.	56.	0.028	117.37	0.948	PB-212	
654.27	327.56	240.	68.	0.034	116.06	1.547	AC-228	s
1544.71	772.82	83.	40.	0.020	108.54	0.842	W-187	sM
1720.70	860.83	38.	45.	0.022	76.42	1.600	TL-208	
1929.87	965.19	44.	47.	0.023	74.80	1.539	AC-228	D

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.
M - Peak is close to a library peak.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-212	148.79	74.81	357.	78.	0.039	104.02	0.993D
PB-212	153.39	77.11	378.	200.	0.100	44.27	0.995A
RA-226	371.56	186.20	604.	146.	0.073	74.84	1.680s
PB-212	477.01	238.93	734.	1087.	0.543	15.08	0.963
RA-224	482.90	241.87	832.	104.	0.052	120.87	1.500s
PB-214	589.93	295.39	252.	258.	0.129	32.60	1.213
AC-228	676.02	338.44	228.	214.	0.107	38.92	1.315
PB-214	703.30	352.08	173.	383.	0.191	21.49	1.238
SB-125	925.82	463.35	137.	75.	0.038	73.01	1.500
TL-208	1020.41	510.65	199.	125.	0.063	51.75	1.132s
TL-208	1165.74	583.32	130.	361.	0.180	22.40	1.336
BI-214	1218.11	609.51	66.	290.	0.145	20.97	1.446
BI-212	1454.47	727.70	99.	122.	0.061	51.51	1.850s
CS-134	1589.25	795.10	54.	38.	0.019	95.20	1.500s
AC-228	1821.62	911.29	61.	248.	0.124	24.10	1.333
AC-228	1936.81	968.90	38.	162.	0.081	28.60	1.541D
BI-214	2238.88	1119.95	118.	100.	0.050	69.25	1.612s
K-40	2921.30	1461.21	42.	1330.	0.665	8.42	1.920
BI-212	3240.76	1620.98	0.	25.	0.012	60.00	1.250s
BI-214	3529.17	1765.21	6.	58.	0.029	41.02	1.036s

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	Peak MDA Value pCi/gm	COMMENTS
BE-7		-5.1038E-03					
			477.56	-5.104E-03	%(	2.703E-01 7.82E-02	G
K-40		1.4199E+01					
			1460.75	1.420E+01	(P	3.518E-01 4.04E-01	G
MN-54		9.0058E-03					
			834.81	9.006E-03	%(P	2.568E-02 7.62E-03	G
CO-57		1.0200E-02					
			122.07	1.020E-02	&(P	4.779E-02 1.43E-02	G K
			136.43	5.675E-02	%	3.714E-01 1.11E-01	G
CO-60		-3.5422E-03					
			1332.51	-3.542E-03	%(P	2.805E-02 7.28E-03	G K
			1173.23	8.655E-03	& P	4.086E-02 1.19E-02	G K
Sr-85		-1.3134E-02					
			514.00	-1.313E-02	%(	3.723E-02 1.12E-02	G
Kr-85		-2.9878E+02					
			513.99	-2.988E+02	%(	8.466E+02 2.54E+02	G
Y-88		3.1129E-03					
			1836.01	3.113E-03	%(P	2.238E-02 6.02E-03	G K
			898.02	-3.282E-03	& P	3.852E-02 1.11E-02	G
NB-94		-1.4461E-03					
			871.10	-1.446E-03	%(	3.144E-02 8.96E-03	G K
			702.50	7.723E-03	&	3.192E-02 9.42E-03	G K
Ag-108M		-1.6526E-02					
			722.95	-1.653E-02	%(	4.420E-02 1.33E-02	G K
			614.37	-2.189E-02	% P	3.830E-02 1.17E-02	G
			433.93	3.372E-03	&	3.258E-02 9.56E-03	G
CD-109		-1.2957E-01					
			88.04	-1.296E-01	&(	1.899E+00 5.68E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SN-113	-3.1293E-03						
		391.71	-3.129E-03	%(	4.480E-02	1.31E-02	G K
		255.04	3.720E-01	&	1.481E+00	4.44E-01	G
SB-125	9.1174E-02						
		427.95	6.656E-04	%(P	8.525E-02	2.47E-02	G K
		600.77	-3.891E-03	% P	1.670E-01	4.82E-02	G
		636.15	3.018E-02	& P	2.515E-01	7.29E-02	G
		463.51	3.591E-01	(P	2.727E-01	8.89E-02	G
		176.29	-1.324E-01	%	5.684E-01	1.71E-01	G
I-131	-3.7340E-04						
		364.48	-3.734E-04	%(P	4.289E-02	1.26E-02	G K
		636.97	4.474E-03	&	4.186E-01	1.19E-01	G
		284.29	-8.450E-02	% P	5.886E-01	1.75E-01	G
CS-134	1.5466E-02						
		604.66	6.431E-04	%(	6.089E-02	1.80E-02	G K
		795.76	3.241E-02	*(P	3.153E-02	1.03E-02	G
		569.29	-2.415E-02	& P	1.438E-01	4.09E-02	G
		801.84	1.382E-01	% P	2.929E-01	8.81E-02	G
CS-137	1.1827E-02						
		661.62	1.183E-02	%(P	3.745E-02	1.11E-02	G
CE-139	9.7042E-04						
		165.85	9.704E-04	%(	4.141E-02	1.23E-02	G
EU-152	3.0819E-02						
		121.78	3.082E-02	&(P	1.396E-01	4.19E-02	G K
		344.30	5.333E-02	& P	9.889E-02	3.01E-02	G
		1408.08	-1.232E-02	%	1.397E-01	3.89E-02	G
		964.00	-3.145E-03	% P	4.176E-01	1.22E-01	G
		1112.07	-4.147E-02	%	2.920E-01	8.47E-02	G
		778.90	-5.219E-02	%	2.243E-01	6.58E-02	G
EU-154	2.1924E-02						
		123.10	2.192E-02	%(	9.472E-02	2.84E-02	G K
		1274.80	-6.610E-03	%	1.054E-01	2.99E-02	G
		723.30	-8.045E-02	%	2.030E-01	6.11E-02	G
		1004.80	6.332E-02	%	1.698E-01	5.07E-02	G
EU-155	1.3918E-01						
		86.45	1.392E-01	%(	2.189E-01	6.68E-02	G K
		105.31	5.291E-02	%	2.068E-01	6.22E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
HG-203	-1.4251E-02						
		279.17	-1.425E-02	&(P	3.354E-02	1.01E-02	G K
		72.87	2.431E-01	& P	1.785E+00	5.34E-01	G
		70.83	1.373E+00	&	3.392E+00	1.03E+00	G
		82.50	-1.115E+00	%	3.646E+00	1.10E+00	G
TL-208	2.4954E-01						
		583.14	2.400E-01	(P	3.719E-02	1.81E-02	G
		510.72	2.861E-01	*(P	1.565E-01	5.99E-02	G
PB-212	7.6530E-01						
		238.63	7.365E-01	(P	8.744E-02	3.75E-02	G K
							Energy duplication
		77.11	7.653E-01	} P	3.571E-01	1.13E-01	G
		74.81	6.076E-01	- P	7.079E-01	2.19E-01	G
PB-214	4.1257E-01						
		351.99	3.937E-01	(P	6.592E-02	2.86E-02	G K
		295.22	4.490E-01	(P	1.338E-01	4.96E-02	G
							Energy duplication
		77.11	5.953E-02	} P	8.800E-01	2.13E-01	G
		241.92	1.878E-01	%	5.626E-01	1.70E-01	G
BI-212	7.0031E-01						
		727.17	7.003E-01	@(P	2.835E-01	1.21E-01	G K
		1620.56	1.121E+00	+ P	3.310E-01	2.25E-01	G
		785.42	2.928E-01	%	1.610E+00	4.70E-01	G
BI-214	3.7216E-01						
		609.32	3.722E-01	(P	5.232E-02	2.66E-02	G K
		1764.51	4.763E-01	+ P	1.206E-01	6.89E-02	G
		1120.28	6.255E-01	+ P	3.331E-01	1.47E-01	G
RA-224	7.8634E-01						
		241.00	7.863E-01	&(	1.033E+00	3.17E-01	G
RA-226	1.1773E+00						
		185.99	1.177E+00	*(P	9.436E-01	3.20E-01	G
AC-228	7.1129E-01						
		911.07	6.894E-01	(P	1.089E-01	5.61E-02	G K
		968.90	7.822E-01	(P	1.525E-01	7.46E-02	G
		338.40	6.611E-01	(P	2.251E-01	8.62E-02	G
TH-227	-2.2164E-01						
		236.00	-2.216E-01	&(	3.866E-01	1.18E-01	G K
		256.25	1.406E-01	% P	4.499E-01	1.35E-01	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments

PA-234       4.7650E-02
                            98.44 4.765E-02 %(P 2.053E-01 6.16E-02 G K
                           946.00-1.657E-02 & P 1.912E-01 5.52E-02 G
                           131.28-1.746E-02 % P 2.032E-01 6.07E-02 G
                            94.67-1.203E-01 % P 4.042E-01 1.22E-01 G
                           883.24 6.601E-02 %   2.737E-01 8.04E-02 G
                           926.70-6.357E-02 %   3.197E-01 9.35E-02 G
                           569.26-3.705E-02 & P 2.243E-01 6.40E-02 G

TH-234       1.7103E+00
                            63.29 1.710E+00 %(P 5.856E+00 1.76E+00 G K
                            92.80 1.257E+00 % P 2.055E+00 6.24E-01 G
                            92.38 1.496E+00 & P 2.425E+00 7.36E-01 G

AM-241      -2.0589E-01
                            59.54-2.059E-01 %(P 1.042E+00 3.12E-01 G
   ( - This peak used in the nuclide activity average.

   * - Peak is too wide, but only one peak in library.
   ! - Peak is part of a multiplet and this area went
       negative during deconvolution.
   ? - Peak is too narrow.
   @ - Peak is too wide at FW25M, but ok at FWHM.
   % - Peak fails sensitivity test.
   $ - Peak identified, but first peak of this nuclide
       failed one or more qualification tests.
   + - Peak activity higher than counting uncertainty range.
   - - Peak activity lower than counting uncertainty range.
   = - Peak outside analysis energy range.
   & - Calculated peak centroid is not close enough to the
       library energy centroid for positive identification.
   P - Peakbackground subtraction
   } - Peak is too close to another for the activity
       to be found directly.

   Nuclide Codes:                      Peak Codes:
   T - Thermal Neutron Activation      G - Gamma Ray
   F - Fast Neutron Activation         X - X-Ray
   I - Fission Product                 P - Positron Decay
   N - Naturally Occurring Isotope     S - Single-Escape
   P - Photon Reaction                 D - Double-Escape
   C - Charged Particle Reaction       K - Key Line
   M - No MDA Calculation              A - Not in Average
   R - Coincidence Corrected           C - Coincidence Peak
   H - Halflife limit exceeded

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
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***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	-5.0107E-03	-5.1038E-03	2.3470E-01	2.3470E-01	2.654E-01
K-40		1.4199E+01	1.4199E+01	1.2125E+00	1.4662E+00	
MN-54	#A	8.9774E-03	9.0058E-03	2.2851E-02	2.2857E-02	2.560E-02
CO-57	#B	1.0163E-02	1.0200E-02	4.3033E-02	4.3037E-02	4.762E-02
CO-60	#B	-3.5404E-03	-3.5422E-03	1.9451E-01	1.9451E-01	2.804E-02
Sr-85	#A	-1.2936E-02	-1.3134E-02	3.3536E-02	3.3545E-02	3.667E-02
Kr-85	#A	-2.9878E+02	-2.9878E+02	7.6259E+02	7.6279E+02	8.466E+02
Y-88	#B	3.0843E-03	3.1129E-03	1.8045E-02	1.8046E-02	2.218E-02
NB-94	#B	-1.4461E-03	-1.4461E-03	2.6887E-02	2.6887E-02	3.144E-02
Ag-108M	#B	-1.6525E-02	-1.6526E-02	3.9815E-02	3.9826E-02	4.420E-02
CD-109	#A	-1.2929E-01	-1.2957E-01	1.7026E+00	1.7027E+00	1.894E+00
SN-113	#B	-3.1026E-03	-3.1293E-03	3.9410E-02	3.9411E-02	4.442E-02
SB-125	#F	9.1085E-02	9.1174E-02	6.7692E-02	6.7899E-02	8.517E-02
I-131	#B	-3.3040E-04	-3.7340E-04	5.1527E-02	5.1527E-02	3.795E-02
CS-134	#B	1.5446E-02	1.5466E-02	1.4757E-02	1.4785E-02	6.081E-02
CS-137	#A	1.1826E-02	1.1827E-02	3.3357E-02	3.3364E-02	3.745E-02
CE-139	#A	9.6350E-04	9.7042E-04	3.6933E-02	3.6933E-02	4.112E-02
EU-152	#B	3.0812E-02	3.0819E-02	1.2573E-01	1.2574E-01	1.396E-01
EU-154	#B	2.1917E-02	2.1924E-02	8.5313E-02	8.5322E-02	9.469E-02
EU-155	#B	1.3910E-01	1.3918E-01	2.0035E-01	2.0050E-01	2.188E-01
HG-203	#B	-1.3953E-02	-1.4251E-02	3.0468E-02	3.0480E-02	3.284E-02
TL-208		2.4954E-01	2.4954E-01	5.6574E-02	5.8400E-02	
PB-212		7.6530E-01	7.6530E-01	1.1668E-01	1.2486E-01	
PB-214		4.1257E-01	4.1257E-01	8.1794E-02	8.5229E-02	
BI-212		7.0031E-01	7.0031E-01	3.6220E-01	3.6448E-01	
BI-214		3.7216E-01	3.7216E-01	7.9778E-02	8.2652E-02	
RA-224	#A	7.8634E-01	7.8634E-01	9.5042E-01	9.5152E-01	1.033E+00
RA-226	#	1.1773E+00	1.1773E+00	9.5909E-01	9.6152E-01	
AC-228		7.1129E-01	7.1129E-01	1.2870E-01	1.3516E-01	
TH-227	#B	-2.2164E-01	-2.2164E-01	3.5296E-01	3.5319E-01	3.866E-01
PA-234	#B	4.7650E-02	4.7650E-02	1.8492E-01	1.8494E-01	2.053E-01
TH-234	#B	1.7103E+00	1.7103E+00	5.2749E+00	5.2758E+00	5.856E+00
AM-241	#A	-2.0589E-01	-2.0589E-01	9.5167E-01	9.5174E-01	1.042E+00

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (1120.0 to 2000.7 keV) 1.8587870E+01 pCi/gm
Total Decayed Activity (1120.0 to 2000.7 keV) 1.8587872E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
DAT

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 107F_25JUL2006_1736.An1

Sample description
FSS-OOL-05-05-002-F

Spectrum Filename: C:\GammaVision\Spectra\107F_25JUL2006_1736.An1

Acquisition information
Start time: 25-Jul-2006 17:36:31
Live time: 2000
Real time: 2002
Dead time: 0.12 %
Detector ID: 2

Detector system
Det 107- DSPE- 634

Calibration
Filename: D7_1LSa.Clb
Detector 107 Calibration for 1 Liter Sand Marinelli

Energy Calibration
Created: 29-Oct-2004 06:48:53
Zero offset: 0.157 keV
Gain: 0.500 keV/channel
Quadratic: -1.676E-08 keV/channel^2

Efficiency Calibration
Created: 29-Oct-2004 06:51:32
Type: Polynomial
Uncertainty: 1.174 %
Coefficients: -0.279532 -4.778179 0.614896
-0.087174 0.005356 -0.000131

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.16keV)
Stop channel: 4000 (2000.15keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 1.8960E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.8960E+03) =
5.2743E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	24-Jul-2006 10:04:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	107_150K_28APR05.Pbc 01-May-2005 05:30:33
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 18 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.2238

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
74.79	389.	11.12	1.18	2.849E-02				
74.79	389.	11.12	1.18	2.849E-02	74.81	9.600	1.004E+00	PB212
77.13	549.	8.56	1.18	2.959E-02	77.11	10.700	1.225E+00	PB214
					77.11	17.500	7.555E-01	PB212
87.27	175.	21.95	1.19	3.313E-02	86.45	32.740	1.162E-01	EU155
					88.04	3.790	PBC<MDA	CD109
90.23	132.	28.53	1.19	3.387E-02				
93.00	238.	15.80	1.19	3.448E-02	92.38	2.570	1.862E+00	TH234
					92.80	3.000	1.510E+00	TH234
186.00	244.	21.36	1.41	3.610E-02	185.99	3.280	1.467E+00	RA226
209.78	128.	32.56	1.01	3.425E-02				
238.78	1387.	3.32	1.30	3.188E-02	238.63	43.100	7.109E-01	PB212
241.99	199.	17.52	1.30	3.162E-02	241.00	3.900	1.133E+00	RA224
					241.92	7.470	5.954E-01	PB214
270.61	91.	26.90	1.78	2.942E-02				
277.46	141.	24.84	1.64	2.892E-02				
295.32	314.	8.43	1.34	2.767E-02	295.22	19.200	4.155E-01	PB214
300.68	72.	31.18	1.34	2.731E-02				
328.30	75.	26.12	1.36	2.559E-02				
338.59	253.	13.07	1.37	2.499E-02	338.40	12.010	5.936E-01	AC228
352.02	572.	6.60	1.51	2.426E-02	351.99	37.100	4.489E-01	PB214
463.46	104.	25.04	1.43	1.953E-02				
463.46	104.	25.04	1.43	1.953E-02	463.51	10.000	3.682E-01	SB125
511.22	197.	15.25	1.72	1.807E-02	510.72	22.500	2.864E-01	TL208
583.41	439.	6.84	1.65	1.628E-02	583.14	86.000	2.210E-01	TL208
609.60	417.	7.17	1.67	1.574E-02	609.32	46.090	4.058E-01	BI214
727.21	135.	22.59	1.57	1.374E-02	727.17	11.800	5.868E-01	BI212

784.27	66.	24.83	1.19	1.297E-02	785.42	2.000	1.826E+00	BI212
795.35	59.	22.87	1.68	1.284E-02	795.76	85.400	3.864E-02	CS134
836.13	32.	38.33	1.71	1.239E-02	834.81	99.978	PBC<MDA	MN54
861.47	109.	19.89	1.91	1.210E-02				
911.47	329.	8.63	1.42	1.160E-02	911.07	29.000	6.885E-01	AC228
964.84	66.	22.43	1.80	1.113E-02	964.00	14.580	PBC<MDA	EU152
969.25	204.	8.88	1.80	1.109E-02	968.90	17.460	7.439E-01	AC228
1121.20	107.	21.51	1.24	9.964E-03	1120.28	15.040	5.053E-01	BI214

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
1461.23	1980.	2.30	2.27	8.189E-03	1460.75	10.700	1.606E+01	K40
1620.41	55.	21.21	0.95	7.569E-03	1620.56	2.750	1.887E+00	BI212
1765.20	88.	11.23	2.33	7.081E-03	1764.51	15.920	5.530E-01	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
149.25	74.81	743.	389.	0.195	33.37	1.178	BI-207	D
153.92	77.14	827.	549.	0.274	25.67	1.179	PB-214	D
174.20	87.54	652.	175.	0.088	65.86	1.187	PB-214	D
180.13	90.50	644.	132.	0.066	85.58	1.189	PB-214	D
185.66	93.27	589.	238.	0.119	47.39	1.191	U-235	D
419.20	209.78	621.	128.	0.064	97.68	1.011	NP-239	
477.20	238.84	365.	1387.	0.693	9.95	1.297	PB-212	D
483.60	242.04	507.	199.	0.099	52.55	1.299	PB-214	D
540.85	270.61	242.	91.	0.045	80.70	1.780	AC-228	s
554.54	277.46	390.	140.	0.070	64.93	1.637	TL-208	s
601.01	300.69	304.	72.	0.036	117.62	0.872	PB-212	s
656.22	328.15	153.	75.	0.037	78.35	1.361	AC-228	D
1722.51	861.47	96.	110.	0.055	47.24	1.909	TL-208	
1929.94	964.86	79.	65.	0.033	68.67	1.797	AC-228	D

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-212	149.29	74.81	1835.	324.	0.162	57.74	1.500D
PB-214	153.89	77.11	1674.	512.	0.256	36.07	1.500D
PB-212	153.89	77.11	1669.	516.	0.258	36.07	1.500D
EU-155	173.98	87.16	1575.	147.	0.073	117.33	1.500
TH-234	185.85	93.09	1414.	193.	0.097	77.19	1.500
RA-226	371.64	186.00	851.	244.	0.122	64.08	1.409s
TH-227	472.11	236.24	1404.	-138.	-0.069	118.08	1.500s
PB-212	477.21	238.79	886.	1305.	0.653	12.57	1.500s
PB-214	590.31	295.34	421.	308.	0.154	32.49	1.500
AC-228	676.80	338.59	294.	250.	0.125	39.22	1.371
PB-214	703.83	352.11	273.	517.	0.259	18.68	1.500s
SB-125	926.70	463.55	189.	84.	0.042	74.13	1.500

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
TL-208	1022.04	511.22	248.	163.	0.082	45.74	1.721s
TL-208	1166.40	583.41	154.	434.	0.217	20.52	1.652
BI-214	1218.78	609.60	154.	413.	0.207	21.52	1.674
BI-212	1453.98	727.21	181.	134.	0.067	67.78	1.570s
BI-212	1568.10	784.27	71.	66.	0.033	74.48	1.187s
CS-134	1590.28	795.35	64.	59.	0.030	68.61	1.684s
MN-54	1671.82	836.13	62.	32.	0.016	115.00	1.711s
AC-228	1822.50	911.47	134.	325.	0.163	25.90	1.425
AC-228	1937.36	968.90	78.	197.	0.098	28.21	1.799D
BI-214	2241.96	1121.20	126.	106.	0.053	64.52	1.244s
K-40	2922.06	1461.23	25.	1975.	0.987	6.89	2.275
BI-212	3240.43	1620.41	15.	55.	0.028	63.64	0.953s
BI-214	3530.06	1765.20	4.	88.	0.044	33.68	2.331

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	MDA Value pCi/gm	COMMENTS
BE-7		2.2108E-02					
			477.56	2.211E-02	%(	2.216E-01 6.49E-02	G
K-40		1.6060E+01					
			1460.75	1.606E+01	(P	2.120E-01 3.70E-01	G
MN-54		1.8504E-02					
			834.81	1.850E-02	(P	2.270E-02 7.19E-03	G
CO-57		-5.5517E-03					
			122.07	-5.552E-03	%(P	3.491E-02 1.05E-02	G K
			136.43	-4.449E-02	& P	2.646E-01 7.93E-02	G
CO-60		-1.4732E-03					
			1332.51	-1.473E-03	&(P	2.634E-02 7.07E-03	G K
			1173.23	9.547E-03	% P	4.425E-02 1.30E-02	G K
Sr-85		-1.3720E-02					
			514.00	-1.372E-02	&(	3.458E-02 1.04E-02	G
Kr-85		-3.3959E+02					
			513.99	-3.396E+02	&(P	7.907E+02 2.37E+02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
Y-88	7.1671E-04						
		1836.01	7.167E-04	%(P	1.955E-02	5.05E-03	G K
		898.02	-6.058E-03	% P	3.533E-02	1.03E-02	G
NB-94	-5.1552E-03						
		871.10	-5.155E-03	%(P	3.041E-02	8.91E-03	G K
		702.50	-1.912E-03	& P	2.713E-02	7.85E-03	G K
Ag-108M	0.0000E+00						
		722.95	0.000E+00	&(	5.131E-02	1.51E-02	G K
		614.37	-1.592E-02	%	3.373E-02	1.02E-02	G
		433.93	-2.009E-03	& P	2.587E-02	7.54E-03	G
CD-109	-6.2111E-02						
		88.04	-6.211E-02	%(P	1.110E+00	3.33E-01	G
SN-113	3.4551E-03						
		391.71	3.455E-03	%(P	3.778E-02	1.11E-02	G K
		255.04	-2.848E-03	&	1.230E+00	3.64E-01	G
SB-125	8.5677E-02						
		427.95	1.107E-02	%(P	7.662E-02	2.25E-02	G K
		600.77	1.865E-02	% P	1.363E-01	3.98E-02	G
		636.15	-3.005E-02	% P	2.146E-01	6.24E-02	G
		463.51	3.065E-01	(P	2.440E-01	7.83E-02	G
		176.29	-6.178E-03	% P	4.473E-01	1.33E-01	G
I-131	-4.4298E-04						
		364.48	-4.430E-04	%(	3.275E-02	9.61E-03	G K
		636.97	-7.809E-03	%	3.802E-01	1.10E-01	G
		284.29	-9.307E-02	%	4.752E-01	1.42E-01	G
CS-134	1.9802E-02						
		604.66	3.319E-03	%(P	2.267E-02	6.61E-03	G K
		795.76	3.864E-02	(P	2.610E-02	8.92E-03	G
		569.29	4.687E-02	%	1.489E-01	4.44E-02	G
		801.84	-9.383E-03	% P	3.621E-01	1.05E-01	G
CS-137	-8.1042E-03						
		661.62	-8.104E-03	&(P	3.511E-02	1.02E-02	G
CE-139	4.1198E-03						
		165.85	4.120E-03	%(P	3.440E-02	1.03E-02	G
EU-152	-2.0607E-02						
		121.78	-2.061E-02	%(P	1.062E-01	3.19E-02	G K
		344.30	-8.862E-04	& P	8.589E-02	2.52E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
		1408.08	-2.830E-03	% P	1.011E-01	2.70E-02	G
		964.00	-2.480E-03	& P	3.856E-01	1.13E-01	G
		1112.07	-6.386E-03	% P	2.899E-01	8.36E-02	G
		778.90	-5.397E-02	% P	2.280E-01	6.72E-02	G
EU-154	-1.1191E-02						
		123.10	-1.119E-02	%(P	6.902E-02	2.07E-02	G K
		1274.80	6.714E-03	& P	1.131E-01	3.27E-02	G
		723.30	1.174E-02	& P	1.475E-01	4.29E-02	G
		1004.80	1.110E-03	% P	1.772E-01	5.07E-02	G
EU-155	9.7385E-02						
		86.45	9.739E-02	(	1.245E-01	3.81E-02	G K
		105.31	2.515E-02	% P	1.453E-01	4.36E-02	G
HG-203	-7.1408E-05						
		279.17	-7.141E-05	&(P	2.998E-02	8.83E-03	G K
		72.87	-1.608E-01	% P	8.729E-01	2.63E-01	G
		70.83	-1.482E-05	%	1.583E+00	4.74E-01	G
		82.50	-4.168E-01	&	1.883E+00	5.67E-01	G
TL-208	2.2098E-01						
		583.14	2.210E-01	(P	3.077E-02	1.53E-02	G
		510.72	2.864E-01	+ P	1.332E-01	5.27E-02	G
PB-212	6.8668E-01						
		238.63	6.767E-01	@(P	7.333E-02	2.87E-02	G K
							Energy duplication
		77.11	7.112E-01	*(	2.659E-01	8.55E-02	G
							Energy duplication
		74.81	8.452E-01	+ P	5.272E-01	1.65E-01	G
PB-214	4.1095E-01						
		351.99	4.098E-01	*(P	6.313E-02	2.58E-02	G K
		295.22	4.132E-01	(P	1.319E-01	4.54E-02	G
							Energy duplication
		77.11	1.153E+00	+ P	4.355E-01	1.40E-01	G
		241.92	1.136E-01	% P	5.024E-01	1.51E-01	G
BI-212	5.8681E-01						
		727.17	5.868E-01	(P	2.878E-01	1.34E-01	G K
		1620.56	1.887E+00	+ P	7.088E-01	4.04E-01	G
		785.42	1.826E+00	+ P	1.150E+00	4.61E-01	G
BI-214	4.0578E-01						
		609.32	4.058E-01	(P	5.946E-02	2.94E-02	G K
		1764.51	5.530E-01	+ P	7.958E-02	6.27E-02	G
		1120.28	5.053E-01	+ P	2.612E-01	1.10E-01	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments

RA-224       5.9649E-01
                          241.00 5.965E-01 %(P 8.948E-01 2.73E-01 G

RA-226       1.4674E+00
                          185.99 1.467E+00 *(  8.346E-01 3.13E-01 G

AC-228       6.7978E-01
                          911.07 6.885E-01  (P 1.199E-01 6.02E-02 G K
                          968.90 7.247E-01  (P 1.615E-01 6.89E-02 G
                          338.40 5.936E-01  (P 1.961E-01 7.86E-02 G

TH-227      -2.7387E-01
                          236.00-2.739E-01 ?(P 3.515E-01 1.08E-01 G K
                          256.25-8.122E-03 % P 3.445E-01 1.01E-01 G

PA-234       4.6114E-02
                           98.44 4.611E-02 %(  1.307E-01 3.95E-02 G K
                          946.00 5.531E-02 &   1.341E-01 4.03E-02 G
                          131.28-3.428E-02 &   1.529E-01 4.60E-02 G
                           94.67-1.458E-01 %   2.337E-01 7.12E-02 G
                          883.24-3.723E-03 %   2.390E-01 6.86E-02 G
                          926.70-9.605E-02 %   3.068E-01 9.15E-02 G
                          569.26 7.572E-02 %   2.176E-01 6.51E-02 G

TH-234       6.8729E-01
                           63.29 1.889E-01 %(P 1.679E+00 5.03E-01 G K
                           92.80 1.335E+00  (P 1.230E+00 3.79E-01 G
                           92.38-2.022E-01 % P 1.451E+00 4.34E-01 G

AM-241       3.0004E-02
                           59.54 3.000E-02 %(P 2.042E-01 6.13E-02 G
   ( - This peak used in the nuclide activity average.

   * - Peak is too wide, but only one peak in library.
   ! - Peak is part of a multiplet and this area went
       negative during deconvolution.
   ? - Peak is too narrow.
   @ - Peak is too wide at FW25M, but ok at FWHM.
   % - Peak fails sensitivity test.
   $ - Peak identified, but first peak of this nuclide
       failed one or more qualification tests.
   + - Peak activity higher than counting uncertainty range.
   - - Peak activity lower than counting uncertainty range.
   = - Peak outside analysis energy range.
   & - Calculated peak centroid is not close enough to the
       library energy centroid for positive identification.
```

P - Peakbackground subtraction
} - Peak is too close to another for the activity
to be found directly.

Nuclide Codes:
T - Thermal Neutron Activation
F - Fast Neutron Activation
I - Fission Product
N - Naturally Occurring Isotope
P - Photon Reaction
C - Charged Particle Reaction
M - No MDA Calculation
R - Coincidence Corrected
H - Halflife limit exceeded

Peak Codes:
G - Gamma Ray
X - X-Ray
P - Positron Decay
S - Single-Escape
D - Double-Escape
K - Key Line
A - Not in Average
C - Coincidence Peak

- -

***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	2.1735E-02	2.2108E-02	1.9456E-01	1.9456E-01	2.179E-01
K-40		1.6060E+01	1.6060E+01	1.1098E+00	1.4599E+00	
MN-54	#A	1.8450E-02	1.8504E-02	2.1563E-02	2.1591E-02	2.263E-02
CO-57	#B	-5.5330E-03	-5.5517E-03	3.2104E-02	3.2105E-02	3.479E-02
CO-60	#B	-1.4725E-03	-1.4732E-03	6.0633E-02	6.0634E-02	2.633E-02
Sr-85	#A	-1.3529E-02	-1.3720E-02	3.1295E-02	3.1306E-02	3.410E-02
Kr-85	#A	-3.3958E+02	-3.3959E+02	8.3814E+02	8.3838E+02	7.907E+02
Y-88	#B	7.1061E-04	7.1671E-04	1.5159E-02	1.5159E-02	1.939E-02
NB-94	#B	-5.1551E-03	-5.1552E-03	2.7567E-02	2.7569E-02	3.041E-02
Ag-108M	#B	0.0000E+00	0.0000E+00	4.5308E-02	4.5308E-02	5.131E-02
CD-109	#A	-6.1986E-02	-6.2111E-02	1.0584E+00	1.0584E+00	1.108E+00
SN-113	#B	3.4279E-03	3.4551E-03	3.3329E-02	3.3329E-02	3.748E-02
SB-125	#F	8.5600E-02	8.5677E-02	6.5646E-02	6.5841E-02	7.655E-02
I-131	#B	-3.9553E-04	-4.4298E-04	2.8822E-02	2.8822E-02	2.924E-02
CS-134	#B	1.9778E-02	1.9802E-02	1.3707E-02	1.3757E-02	2.265E-02
CS-137	#A	-8.1035E-03	-8.1042E-03	5.1068E-02	5.1071E-02	3.511E-02
CE-139	#A	4.0926E-03	4.1198E-03	3.0868E-02	3.0869E-02	3.417E-02
EU-152	#B	-2.0603E-02	-2.0607E-02	9.6532E-02	9.6539E-02	1.062E-01
EU-154	#B	-1.1188E-02	-1.1191E-02	6.4891E-02	6.4894E-02	6.900E-02
EU-155	#A	9.7336E-02	9.7385E-02	1.1426E-01	1.1439E-01	1.244E-01
HG-203	#B	-7.0026E-05	-7.1408E-05	3.7982E-02	3.7982E-02	2.940E-02
TL-208		2.2098E-01	2.2098E-01	4.5817E-02	4.7639E-02	
PB-212	#	6.8668E-01	6.8668E-01	8.7339E-02	9.6296E-02	7.333E-02
PB-214	#	4.1095E-01	4.1095E-01	7.7514E-02	8.1225E-02	6.313E-02
BI-212		5.8681E-01	5.8681E-01	4.0160E-01	4.0309E-01	
BI-214		4.0578E-01	4.0578E-01	8.8220E-02	9.1418E-02	
RA-224	#A	5.9649E-01	5.9649E-01	8.1914E-01	8.1990E-01	8.948E-01
RA-226	#	1.4674E+00	1.4674E+00	9.4041E-01	9.4440E-01	
AC-228		6.7978E-01	6.7978E-01	1.2577E-01	1.3202E-01	
TH-227	#A	-2.7387E-01	-2.7387E-01	3.2402E-01	3.2442E-01	3.515E-01

PA-234 #B	4.6114E-02	4.6114E-02	1.1840E-01	1.1843E-01	1.307E-01

TH-234 #B	6.8729E-01	6.8729E-01	5.8469E-01	5.8593E-01	1.679E+00
AM-241 #A	3.0004E-02	3.0004E-02	1.8376E-01	1.8377E-01	2.042E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (1120.2 to 2000.1 keV) 1.9420971E+01 pCi/gm
Total Decayed Activity (1120.2 to 2000.1 keV) 1.9420973E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
DAT

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 107F_25JUL2006_1813.An1

Sample description
FSS-OOL-05-05-009-F

Spectrum Filename: C:\GammaVision\Spectra\107F_25JUL2006_1813.An1

Acquisition information

Start time:	25-Jul-2006 18:13:16
Live time:	2000
Real time:	2002
Dead time:	0.10 %
Detector ID:	2

Detector system
Det 107- DSPE- 634

Calibration

Filename:	D7_1LSa.Clb

Detector 107 Calibration for 1 Liter Sand Marinelli

Energy Calibration

Created:	29-Oct-2004 06:48:53
Zero offset:	0.157 keV
Gain:	0.500 keV/channel
Quadratic:	-1.676E-08 keV/channel^2

Efficiency Calibration

Created:	29-Oct-2004 06:51:32
Type:	Polynomial
Uncertainty:	1.174 %
Coefficients:	-0.279532 -4.778179 0.614896
	-0.087174 0.005356 -0.000131

Library Files

Main analysis library:	FSS_Rev_1.Lib
Library Match Width:	1.000
Peak stripping:	Library based

Analysis parameters

Analysis engine:	Env32 G53W4.20
Start channel:	100 (50.16keV)
Stop channel:	4000 (2000.15keV)
Peak rejection level:	41.667%
Peak search sensitivity:	3
Sample Size:	1.8390E+03
Activity scaling factor:	1.0000E+06/(1.0000E+00* 1.8390E+03) = 5.4377E+02
Detection limit method:	Nureg 4.16
Random error:	1.0000000E+00
Systematic error:	1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	24-Jul-2006 08:19:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	107_150K_28APR05.Pbc 01-May-2005 05:30:33
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 20 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.1899

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
74.94	259.	21.75	1.50	2.849E-02				
74.94	259.	21.75	1.50	2.849E-02	74.81	9.600	6.944E-01	PB212
77.07	416.	13.22	1.50	2.957E-02				
77.07	416.	13.22	1.50	2.957E-02	77.11	17.500	5.900E-01	PB212
					77.11	10.700	9.539E-01	PB214
77.07	411.	13.22	1.50	2.957E-02				
77.07	411.	13.22	1.50	2.957E-02	77.11	17.500	5.832E-01	PB212
					77.11	10.700	9.539E-01	PB214
86.65	164.	21.67	1.19	3.287E-02	86.45	32.740	1.119E-01	EU155
89.76	130.	26.36	1.19	3.367E-02				
93.78	136.	25.64	1.19	3.457E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
186.23	150.	25.38	1.16	3.608E-02	185.99	3.280	9.339E-01	RA226
209.27	125.	30.39	1.31	3.429E-02				
238.81	974.	4.11	1.30	3.188E-02	238.63	43.100	5.124E-01	PB212
241.46	179.	21.60	1.30	3.167E-02	241.00	3.900	1.053E+00	RA224
					241.92	7.470	5.533E-01	PB214
270.39	145.	25.34	1.81	2.943E-02				
277.78	74.	37.10	1.47	2.889E-02				
295.39	255.	9.07	1.34	2.768E-02	295.22	19.200	3.459E-01	PB214
300.75	80.	23.01	1.34	2.732E-02				
328.36	83.	32.81	1.54	2.558E-02				
338.60	219.	17.77	1.25	2.499E-02	338.40	12.010	5.280E-01	AC228
352.09	467.	8.84	1.53	2.425E-02	351.99	37.100	3.773E-01	PB214
463.27	54.	32.34	1.50	1.953E-02	463.51	10.000	PBC<MDA	SB125
511.11	194.	15.99	1.15	1.807E-02	510.72	22.500	2.896E-01	TL208
583.23	410.	8.56	1.39	1.629E-02	583.14	86.000	2.126E-01	TL208

609.62	339.	7.84	1.73	1.574E-02	609.32	46.090	3.390E-01	BI214
662.37	118.	17.70	1.82	1.476E-02	661.62	84.620	6.730E-02	CS137
727.41	82.	23.72	1.60	1.374E-02	727.17	11.800	3.676E-01	BI212
795.36	48.	31.08	1.68	1.284E-02	795.76	85.400	3.219E-02	CS134
911.49	272.	8.26	1.82	1.160E-02	911.07	29.000	5.854E-01	AC228
969.01	195.	11.78	1.70	1.109E-02	968.90	17.460	7.313E-01	AC228
1121.98	151.	15.42	2.03	9.959E-03	1120.28	15.040	7.337E-01	BI214
1461.24	1551.	2.59	2.23	8.189E-03	1460.75	10.700	1.296E+01	K40

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
1765.23	62.	13.58	1.50	7.081E-03	1764.51	15.920	4.008E-01	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
179.19	89.67	526.	130.	0.065	79.07	1.189	PB-214	lD
418.18	209.27	509.	125.	0.063	91.18	1.308	AC-228	s
477.24	238.80	313.	974.	0.487	12.32	1.297	PB-212	D
482.55	241.45	661.	179.	0.090	64.79	1.299	RA-224	D
540.41	270.39	386.	145.	0.072	76.02	1.807	AC-228	s
600.79	300.58	160.	76.	0.038	79.55	1.125	PB-212	
656.33	328.36	241.	83.	0.041	98.42	1.538	RH-106M	

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-212	149.55	74.94	1500.	259.	0.129	65.24	1.500s
PB-212	153.89	77.11	1301.	416.	0.208	39.66	1.500D
PB-214	153.89	77.11	1306.	411.	0.205	39.66	1.500D
EU-155	173.91	87.12	1271.	141.	0.070	110.35	1.500
TH-234	185.79	93.06	1191.	165.	0.082	87.38	1.500s
TH-234	185.72	93.03	1176.	149.	0.075	88.44	1.500s
RA-226	372.11	186.23	524.	150.	0.075	76.15	1.161
PB-212	477.16	238.76	762.	904.	0.452	16.02	1.500s
PB-214	590.06	295.22	303.	251.	0.126	34.25	1.500D
AC-228	676.81	338.60	373.	216.	0.108	53.30	1.250
PB-214	704.03	352.21	229.	432.	0.216	20.42	1.500s
SB-125	926.13	463.27	145.	54.	0.027	97.03	1.500s
TL-208	1021.78	511.09	222.	159.	0.079	47.47	1.152s
TL-208	1166.04	583.23	200.	405.	0.203	25.67	1.387s
BI-214	1218.81	609.62	112.	335.	0.167	23.52	1.729
CS-137	1324.32	662.37	110.	114.	0.057	53.09	1.825s
BI-212	1454.69	727.56	77.	63.	0.031	68.69	1.638
CS-134	1590.29	795.36	90.	48.	0.024	93.23	1.684
AC-228	1822.55	911.49	80.	268.	0.134	24.79	1.817s
AC-228	1937.59	969.01	97.	193.	0.096	35.33	1.699
BI-214	2243.52	1121.98	89.	150.	0.075	46.27	2.028s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
K-40	2922.08	1461.24	20.	1546.	0.773	7.76	2.234
BI-214	3530.12	1765.23	3.	62.	0.031	40.73	1.496s

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	MDA Value pCi/gm	COMMENTS
BE-7		4.6424E-02					
			477.56	4.642E-02	&(	1.975E-01	5.83E-02 G
K-40		1.2964E+01					
			1460.75	1.296E+01	(P	1.963E-01	3.37E-01 G
MN-54		3.4769E-03					
			834.81	3.477E-03	%(P	2.858E-02	8.30E-03 G
CO-57		-2.6122E-04					
			122.07	-2.612E-04	%(P	3.176E-02	9.45E-03 G K
			136.43	6.482E-03	% P	2.314E-01	6.88E-02 G
CO-60		-6.0355E-03					
			1332.51	-6.036E-03	%(P	3.090E-02	8.52E-03 G K
			1173.23	3.209E-04	% P	4.276E-02	1.23E-02 G K
Sr-85		-1.0136E-02					
			514.00	-1.014E-02	%(	3.186E-02	9.55E-03 G
Kr-85		-2.5890E+02					
			513.99	-2.589E+02	%(P	7.288E+02	2.17E+02 G
Y-88		-8.8444E-04					
			1836.01	-8.844E-04	%(P	2.512E-02	6.58E-03 G K
			898.02	5.310E-03	% P	2.912E-02	8.46E-03 G
NB-94		5.2518E-03					
			871.10	5.252E-03	%(P	2.070E-02	6.05E-03 G K
			702.50	1.936E-03	& P	2.814E-02	8.17E-03 G K
Ag-108M		0.0000E+00					
			722.95	0.000E+00	&(	5.238E-02	1.54E-02 G K
			614.37	-1.879E-02	%	3.226E-02	9.87E-03 G
			433.93	-6.586E-04	& P	2.218E-02	6.36E-03 G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CD-109	2.8415E-01						
		88.04	2.842E-01	%(P	8.226E-01	2.48E-01	G
SN-113	-7.3176E-04						
		391.71	-7.318E-04	%(P	3.756E-02	1.09E-02	G K
		255.04	-8.120E-02	&	1.134E+00	3.36E-01	G
SB-125	4.2065E-02						
		427.95	-1.292E-02	%(P	7.368E-02	2.16E-02	G K
		600.77	2.724E-02	& P	1.205E-01	3.53E-02	G
		636.15	2.663E-02	% P	2.058E-01	5.98E-02	G
		463.51	2.048E-01	(P	2.218E-01	6.97E-02	G
		176.29	-1.014E-01	& P	3.940E-01	1.18E-01	G
I-131	-4.6060E-04						
		364.48	-4.606E-04	%(	3.024E-02	8.83E-03	G K
		636.97	7.427E-02	%	3.855E-01	1.13E-01	G
		284.29	-2.639E-02	%	4.205E-01	1.24E-01	G
CS-134	1.1040E-02						
		604.66	-7.462E-03	%(P	2.587E-02	7.67E-03	G K
		795.76	3.219E-02	(P	3.146E-02	1.01E-02	G
		569.29	3.324E-02	&	1.497E-01	4.42E-02	G
		801.84	-1.418E-02	% P	2.535E-01	7.19E-02	G
CS-137	6.7301E-02						
		661.62	6.730E-02	*(P	3.027E-02	1.23E-02	G
CE-139	1.0507E-03						
		165.85	1.051E-03	&(P	3.204E-02	9.53E-03	G
EU-152	1.1541E-02						
		121.78	1.154E-02	%(P	8.976E-02	2.68E-02	G K
		344.30	1.560E-02	% P	8.545E-02	2.53E-02	G
		1408.08	3.373E-02	& P	1.096E-01	3.19E-02	G
		964.00	-2.728E-03	& P	3.257E-01	9.52E-02	G
		1112.07	1.325E-02	& P	1.786E-01	5.03E-02	G
		778.90	4.556E-02	% P	1.996E-01	5.86E-02	G
EU-154	-1.1299E-02						
		123.10	-1.130E-02	%(P	6.521E-02	1.95E-02	G K
		1274.80	2.427E-02	% P	8.302E-02	2.44E-02	G
		723.30	4.478E-02	& P	9.826E-02	2.97E-02	G
		1004.80	-2.485E-02	% P	1.788E-01	5.19E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
EU-155	9.6305E-02						
		86.45	9.630E-02	(	1.155E-01	3.54E-02	G K
		105.31	3.324E-02	% P	1.248E-01	3.75E-02	G
HG-203	-1.8168E-04						
		279.17	-1.817E-04	&(P	2.570E-02	7.52E-03	G K
		72.87	-2.556E-01	% P	8.676E-01	2.62E-01	G
		70.83	-9.708E-01	&	1.425E+00	4.35E-01	G
		82.50	-8.807E-01	%	1.784E+00	5.41E-01	G
TL-208	2.1257E-01						
		583.14	2.126E-01	@(P	3.597E-02	1.84E-02	G
		510.72	2.869E-01	+ P	1.304E-01	5.50E-02	G
PB-212	4.8324E-01						
		238.63	4.832E-01	*(P	7.022E-02	2.63E-02	G K
							Energy duplication
		77.11	5.900E-01	+	2.425E-01	7.80E-02	G
		74.81	6.944E-01	& P	4.922E-01	1.53E-01	G
PB-214	3.5069E-01						
		351.99	3.525E-01	(P	5.975E-02	2.43E-02	G K
							Energy duplication
		295.22	3.472E-01	(P	1.159E-01	4.04E-02	G
							Energy duplication
		77.11	9.539E-01	+ P	3.973E-01	1.28E-01	G
		241.92	-1.017E-02	% P	4.886E-01	1.46E-01	G
BI-212	2.8432E-01						
		727.17	2.843E-01	?(P	1.973E-01	6.64E-02	G K
		1620.56	2.551E-01	% P	6.224E-01	1.84E-01	G
		785.42	2.742E-01	% P	1.468E+00	4.30E-01	G
BI-214	3.5482E-01						
		609.32	3.390E-01	(P	5.277E-02	2.69E-02	G K
		1764.51	4.008E-01	(P	7.443E-02	5.52E-02	G
		1120.28	7.337E-01	+ P	2.291E-01	1.14E-01	G
RA-224	4.0108E-01						
		241.00	4.011E-01	%(P	8.456E-01	2.56E-01	G
RA-226	9.3395E-01						
		185.99	9.339E-01	(	6.785E-01	2.37E-01	G
AC-228	5.6858E-01						
		911.07	5.854E-01	@(P	9.680E-02	4.92E-02	G K
		968.90	7.313E-01	+ P	1.846E-01	8.72E-02	G
		338.40	5.280E-01	(P	2.269E-01	9.53E-02	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments

TH-227      -1.8785E-01
                          236.00-1.878E-01 %(P 3.052E-01 9.30E-02 G K
                          256.25 2.569E-02 & P 3.409E-01 1.01E-01 G

PA-234      -5.2347E-05
                           98.44-5.235E-05 %(  1.121E-01 3.33E-02 G K
                          946.00 2.925E-04 &   1.472E-01 4.20E-02 G
                          131.28 7.064E-02 %   1.260E-01 3.84E-02 G
                           94.67-8.993E-02 %   2.211E-01 6.69E-02 G
                          883.24 0.000E+00 %   2.289E-01 6.52E-02 G
                          926.70 7.564E-03 &   2.364E-01 6.73E-02 G
                          569.26 4.922E-02 &   2.218E-01 6.54E-02 G

TH-234       9.6780E-01
                           63.29 6.256E-01 %(P 1.402E+00 4.23E-01 G K
                           92.80 1.063E+00  (P 1.158E+00 3.55E-01 G
                           92.38 1.376E+00 &(P 1.363E+00 4.20E-01 G

AM-241      -5.8610E-02
                           59.54-5.861E-02 &(P 1.878E-01 5.66E-02 G
   ( - This peak used in the nuclide activity average.

   * - Peak is too wide, but only one peak in library.
   ! - Peak is part of a multiplet and this area went
       negative during deconvolution.
   ? - Peak is too narrow.
   @ - Peak is too wide at FW25M, but ok at FWHM.
   % - Peak fails sensitivity test.
   $ - Peak identified, but first peak of this nuclide
       failed one or more qualification tests.
   + - Peak activity higher than counting uncertainty range.
   - - Peak activity lower than counting uncertainty range.
   = - Peak outside analysis energy range.
   & - Calculated peak centroid is not close enough to the
       library energy centroid for positive identification.
   P - Peakbackground subtraction
   } - Peak is too close to another for the activity
       to be found directly.

   Nuclide Codes:                      Peak Codes:
   T - Thermal Neutron Activation      G - Gamma Ray
   F - Fast Neutron Activation         X - X-Ray
   I - Fission Product                 P - Positron Decay
   N - Naturally Occurring Isotope     S - Single-Escape
   P - Photon Reaction                 D - Double-Escape
   C - Charged Particle Reaction       K - Key Line
   M - No MDA Calculation              A - Not in Average
```

R - Coincidence Corrected C - Coincidence Peak
H - Halflife limit exceeded

- -

***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	4.5581E-02	4.6424E-02	1.7498E-01	1.7500E-01	1.939E-01
K-40		1.2964E+01	1.2964E+01	1.0096E+00	1.2671E+00	
MN-54	#A	3.4660E-03	3.4769E-03	2.4904E-02	2.4905E-02	2.849E-02
CO-57	#B	-2.6027E-04	-2.6122E-04	4.6254E-02	4.6254E-02	3.165E-02
CO-60	#B	-6.0324E-03	-6.0355E-03	8.1518E-02	8.1519E-02	3.089E-02
Sr-85	#A	-9.9838E-03	-1.0136E-02	2.8653E-02	2.8659E-02	3.139E-02
Kr-85	#A	-2.5889E+02	-2.5890E+02	8.1225E+02	8.1240E+02	7.288E+02
Y-88	#B	-8.7636E-04	-8.8444E-04	3.2135E-02	3.2135E-02	2.489E-02
NB-94	#B	5.2518E-03	5.2518E-03	1.8142E-02	1.8144E-02	2.070E-02
Ag-108M	#B	0.0000E+00	0.0000E+00	4.6235E-02	4.6235E-02	5.238E-02
CD-109	#A	2.8354E-01	2.8415E-01	7.4459E-01	7.4476E-01	8.209E-01
SN-113	#B	-7.2556E-04	-7.3176E-04	2.6498E-01	2.6498E-01	3.724E-02
SB-125	#B	4.2024E-02	4.2065E-02	4.2928E-02	4.2999E-02	7.361E-02
I-131	#B	-4.0779E-04	-4.6060E-04	2.6496E-02	2.6496E-02	2.677E-02
CS-134	#B	1.1026E-02	1.1040E-02	1.0406E-02	1.0427E-02	2.583E-02
CS-137	#	6.7295E-02	6.7301E-02	3.6830E-02	3.7044E-02	
CE-139	#A	1.0432E-03	1.0507E-03	2.8602E-02	2.8602E-02	3.182E-02
EU-152	#B	1.1539E-02	1.1541E-02	8.0508E-02	8.0510E-02	8.974E-02
EU-154	#B	-1.1295E-02	-1.1299E-02	6.1318E-02	6.1321E-02	6.519E-02
EU-155	#A	9.6252E-02	9.6305E-02	1.0627E-01	1.0641E-01	1.154E-01
HG-203	#B	-1.7790E-04	-1.8168E-04	5.7850E-02	5.7850E-02	2.516E-02
TL-208	#	2.1257E-01	2.1257E-01	5.5180E-02	5.6590E-02	
PB-212	#	4.8324E-01	4.8324E-01	7.8767E-02	8.3779E-02	7.022E-02
PB-214	#	3.5069E-01	3.5069E-01	7.1074E-02	7.4031E-02	5.975E-02
BI-212	#	2.8432E-01	2.8432E-01	1.9932E-01	2.0003E-01	1.973E-01
BI-214		3.5482E-01	3.5482E-01	8.4524E-02	8.7083E-02	
RA-224	#A	4.0108E-01	4.0108E-01	7.6882E-01	7.6918E-01	8.456E-01
RA-226		9.3395E-01	9.3395E-01	7.1117E-01	7.1330E-01	
AC-228		5.6858E-01	5.6858E-01	1.4319E-01	1.4708E-01	
TH-227	#B	-1.8785E-01	-1.8785E-01	2.8068E-01	2.8090E-01	3.052E-01
PA-234	#B	-5.2347E-05	-5.2347E-05	1.0005E-01	1.0005E-01	1.121E-01
TH-234	#B	9.6780E-01	9.6780E-01	7.8761E-01	7.8944E-01	1.402E+00
AM-241	#A	-5.8609E-02	-5.8610E-02	1.7451E-01	1.7454E-01	1.878E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.

H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (270.2 to 2000.1 keV) 1.5385976E+01 pCi/gm
Total Decayed Activity (270.2 to 2000.1 keV) 1.5385983E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
DAT

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 107F_25JUL2006_1849.An1

Sample description
FSS-OOL-05-05-018-F

Spectrum Filename: C:\GammaVision\Spectra\107F_25JUL2006_1849.An1

Acquisition information
Start time: 25-Jul-2006 18:49:55
Live time: 2000
Real time: 2002
Dead time: 0.11 %
Detector ID: 2

Detector system
Det 107- DSPE- 634

Calibration
Filename: D7_1LSa.Clb
Detector 107 Calibration for 1 Liter Sand Marinelli

Energy Calibration
Created: 29-Oct-2004 06:48:53
Zero offset: 0.157 keV
Gain: 0.500 keV/channel
Quadratic: -1.676E-08 keV/channel^2

Efficiency Calibration
Created: 29-Oct-2004 06:51:32
Type: Polynomial
Uncertainty: 1.174 %
Coefficients: -0.279532 -4.778179 0.614896
-0.087174 0.005356 -0.000131

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.16keV)
Stop channel: 4000 (2000.15keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 1.7370E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.7370E+03) =
5.7571E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	24-Jul-2006 07:51:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	107_150K_28APR05.Pbc 01-May-2005 05:30:33
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 18 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.1740

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
75.00	275.	22.42	1.50	2.849E-02	74.81	9.600	7.823E-01	PB212
77.06	428.	13.78	1.50	2.957E-02	77.11	10.700	1.051E+00	PB214
					77.11	17.500	6.427E-01	PB212
77.06	432.	13.78	1.50	2.957E-02	77.11	10.700	1.051E+00	PB214
					77.11	17.500	6.499E-01	PB212
84.27	82.	38.41	0.95	3.220E-02				
93.12	127.	35.65	1.50	3.438E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
					98.44	25.100	PBC<MDA	PA234
185.68	160.	24.62	1.35	3.612E-02	185.99	3.280	1.050E+00	RA226
238.74	1174.	3.59	1.30	3.188E-02	238.63	43.100	6.553E-01	PB212
241.91	246.	13.25	1.30	3.163E-02	241.00	3.900	1.531E+00	RA224
					241.92	7.470	8.037E-01	PB214
269.79	172.	16.67	1.83	2.948E-02				
295.34	293.	8.49	1.34	2.767E-02	295.22	19.200	4.219E-01	PB214
300.48	90.	21.98	1.34	2.732E-02				
328.17	76.	33.94	1.59	2.559E-02				
338.34	278.	13.63	1.73	2.501E-02	338.40	12.010	7.124E-01	AC228
352.02	615.	6.16	1.66	2.426E-02	351.99	37.100	5.269E-01	PB214
462.83	99.	23.74	1.22	1.955E-02				
462.83	99.	23.74	1.22	1.955E-02	463.51	10.000	3.836E-01	SB125
510.96	167.	15.37	1.77	1.807E-02	510.72	22.500	2.550E-01	TL208
583.41	454.	7.47	1.81	1.628E-02	583.14	86.000	2.496E-01	TL208
609.49	430.	8.62	1.74	1.574E-02	609.32	46.090	4.564E-01	BI214
662.81	77.	28.89	1.86	1.477E-02	661.62	84.620	4.803E-02	CS137
727.28	142.	15.94	1.81	1.374E-02	727.17	11.800	6.770E-01	BI212
794.86	85.	21.64	1.83	1.285E-02				

794.86	85.	21.64	1.83	1.285E-02	795.76	85.400	6.009E-02	CS134
836.56	30.	40.96	1.71	1.239E-02	834.81	99.978	PBC<MDA	MN54
904.65	23.	39.46	1.76	1.167E-02				
911.54	274.	6.94	1.76	1.160E-02	911.07	29.000	6.227E-01	AC228
964.65	63.	20.46	1.80	1.113E-02				
969.26	173.	9.27	1.80	1.109E-02	968.90	17.460	6.858E-01	AC228
1120.88	88.	23.45	1.93	9.966E-03	1120.28	15.040	4.499E-01	BI214
1377.83	62.	23.90	1.49	8.557E-03				

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
1408.18	18.	40.50	2.08	8.420E-03	1408.08	21.210	PBC<MDA	EU152
1461.26	1545.	2.60	2.29	8.189E-03	1460.75	10.700	1.367E+01	K40
1620.20	17.	35.67	0.76	7.569E-03	1620.56	2.750	6.316E-01	BI212
1765.01	90.	10.54	1.96	7.082E-03	1764.51	15.920	6.147E-01	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
477.11	238.79	300.	1174.	0.587	10.77	1.297	PB-212	D
483.46	241.96	406.	246.	0.123	39.75	1.299	PB-214	D
539.21	269.79	282.	172.	0.086	50.00	1.834	AC-228	s
600.64	300.51	266.	106.	0.053	78.18	1.040	PB-212	
655.96	328.17	232.	76.	0.038	101.83	1.593	AC-228	
1808.86	904.57	29.	23.	0.011	118.38	1.757	KR-89	lD
1929.37	964.58	51.	63.	0.031	61.43	1.796	AC-228	D
2755.25	1377.83	35.	62.	0.031	71.69	1.493	BI-214	s

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-212	149.68	75.00	1821.	275.	0.138	67.27	1.500s
PB-214	153.89	77.11	1563.	428.	0.214	41.34	1.500D
PB-212	153.89	77.11	1558.	432.	0.216	41.34	1.500D
TH-234	185.91	93.12	1323.	127.	0.064	106.96	1.500s
RA-226	370.99	185.68	578.	160.	0.080	73.85	1.347s
PB-212	477.17	238.77	777.	1084.	0.542	13.97	1.500s
RA-224	483.12	241.74	844.	174.	0.087	73.47	1.500
PB-214	483.73	242.05	980.	112.	0.056	120.47	1.500
PB-214	590.32	295.35	311.	301.	0.151	29.73	1.500s
AC-228	676.30	338.34	344.	275.	0.137	40.88	1.733s
PB-214	703.78	352.08	214.	560.	0.280	16.63	1.500s
SB-125	926.15	463.28	172.	66.	0.033	87.95	1.500s
TL-208	1021.50	510.96	198.	133.	0.067	46.12	1.773s
TL-208	1166.40	583.41	179.	449.	0.225	22.41	1.811s
BI-214	1218.56	609.49	214.	426.	0.213	25.87	1.738
Ag-108M	1224.02	612.22	240.	-56.	-0.028	123.33	1.561s
CS-137	1325.20	662.81	144.	77.	0.039	86.68	1.856s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
BI-212	1454.13	727.28	118.	141.	0.071	47.83	1.815
CS-134	1589.98	795.21	82.	56.	0.028	78.71	1.684
MN-54	1672.69	836.56	62.	30.	0.015	122.89	1.711s
AC-228	1822.48	911.46	98.	289.	0.145	25.67	1.713
AC-228	1937.36	968.90	48.	171.	0.085	28.24	1.799D
BI-214	2241.32	1120.88	99.	87.	0.043	70.36	1.931
K-40	2922.11	1461.26	23.	1540.	0.770	7.79	2.290
BI-212	3240.02	1620.20	7.	17.	0.008	107.01	0.765s
BI-214	3529.67	1765.01	1.	89.	0.045	31.62	1.958

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	Peak MDA Value pCi/gm	Peak	COMMENTS
BE-7		2.2477E-02						
			477.56	2.248E-02	&(	2.564E-01	7.51E-02	G
K-40		1.3671E+01						
			1460.75	1.367E+01	(P	2.221E-01	3.56E-01	G
MN-54		1.8839E-02						
			834.81	1.884E-02	?(P	2.491E-02	7.83E-03	G
CO-57		-8.3639E-03						
			122.07	-8.364E-03	&(P	3.555E-02	1.07E-02	G K
			136.43	-7.358E-02	% P	2.815E-01	8.47E-02	G
CO-60		-8.4597E-03						
			1332.51	-8.460E-03	%(P	3.445E-02	9.65E-03	G K
			1173.23	9.206E-03	% P	3.711E-02	1.08E-02	G K
Sr-85		-1.1905E-02						
			514.00	-1.191E-02	%(	3.441E-02	1.03E-02	G
Kr-85		-3.0068E+02						
			513.99	-3.007E+02	%(P	7.864E+02	2.35E+02	G
Y-88		2.2322E-05						
			1836.01	2.232E-05	%(P	2.023E-02	5.09E-03	G K
			898.02	-5.339E-03	& P	3.378E-02	9.74E-03	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
NB-94	-6.8019E-03						
		871.10	-6.802E-03	%(P	2.880E-02	8.46E-03	G K
		702.50	7.870E-03	% P	2.801E-02	8.30E-03	G K
Ag-108M	-2.2237E-03						
		722.95	-2.224E-03	%(	3.350E-02	9.72E-03	G K
		614.37	-3.098E-02	&	4.119E-02	1.27E-02	G
		433.93	-6.296E-03	% P	2.718E-02	8.01E-03	G
CD-109	5.0172E-01						
		88.04	5.017E-01	%(P	1.112E+00	3.37E-01	G
SN-113	4.9266E-03						
		391.71	4.927E-03	%(P	3.932E-02	1.16E-02	G K
		255.04	-1.678E-02	&	1.233E+00	3.64E-01	G
SB-125	6.5058E-02						
		427.95	-1.889E-03	%(P	8.383E-02	2.43E-02	G K
		600.77	-4.210E-02	% P	1.484E-01	4.38E-02	G
		636.15	6.682E-02	% P	2.206E-01	6.55E-02	G
		463.51	2.632E-01	*(P	2.545E-01	8.05E-02	G
		176.29	2.436E-02	% P	4.443E-01	1.32E-01	G
I-131	1.9935E-03						
		364.48	1.993E-03	%(	2.339E-02	6.79E-03	G K
		636.97	8.929E-03	%	3.929E-01	1.13E-01	G
		284.29	3.244E-02	&	4.259E-01	1.26E-01	G
CS-134	1.7853E-02						
		604.66	-1.376E-03	&(P	6.169E-02	1.83E-02	G K
		795.76	3.983E-02	(P	3.199E-02	1.05E-02	G
		569.29	-1.742E-03	%	1.495E-01	4.29E-02	G
		801.84	-1.436E-02	% P	3.172E-01	9.09E-02	G
CS-137	4.8035E-02						
		661.62	4.803E-02	*(P	3.648E-02	1.45E-02	G
CE-139	-7.1348E-03						
		165.85	-7.135E-03	%(P	3.612E-02	1.08E-02	G
EU-152	-2.0128E-02						
		121.78	-2.013E-02	&(P	9.907E-02	2.97E-02	G K
		344.30	6.857E-03	% P	8.554E-02	2.51E-02	G
		1408.08	7.994E-02	% P	1.048E-01	3.36E-02	G
		964.00	1.184E-02	& P	2.304E-01	6.64E-02	G
		1112.07	-7.532E-02	& P	2.821E-01	8.32E-02	G
		778.90	-1.547E-02	% P	2.144E-01	6.16E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
EU-154	-1.5284E-02						
		123.10	-1.528E-02	%(P	7.909E-02	2.37E-02	G K
		1274.80	3.771E-02	% P	9.987E-02	2.99E-02	G
		723.30	-1.221E-01	% P	2.123E-01	6.47E-02	G
		1004.80	5.116E-02	& P	1.255E-01	3.76E-02	G
EU-155	7.7734E-02						
		86.45	7.773E-02	%(	1.304E-01	3.97E-02	G K
		105.31	3.487E-02	% P	1.466E-01	4.41E-02	G
HG-203	-5.5748E-03						
		279.17	-5.575E-03	&(P	3.235E-02	9.61E-03	G K
		72.87	-3.758E-01	% P	9.944E-01	3.01E-01	G
		70.83	3.718E-01	%	1.653E+00	4.98E-01	G
		82.50	-7.482E-01	%	1.956E+00	5.92E-01	G
TL-208	2.5072E-01						
		583.14	2.496E-01	@(P	3.608E-02	1.88E-02	G
		510.72	2.550E-01	*(P	1.305E-01	4.91E-02	G
PB-212	6.2396E-01						
		238.63	6.134E-01	@(P	7.503E-02	2.90E-02	G K
							Energy duplication
		77.11	6.499E-01	*(	2.806E-01	8.96E-02	G
		74.81	7.823E-01	& P	5.732E-01	1.78E-01	G
PB-214	4.6960E-01						
		351.99	4.844E-01	(P	6.124E-02	2.71E-02	G K
		295.22	4.411E-01	(P	1.242E-01	4.44E-02	G
							Energy duplication
		77.11	1.051E+00	+ P	4.596E-01	1.46E-01	G
		241.92	3.684E-01	- P	4.894E-01	1.50E-01	G
BI-212	6.6840E-01						
		727.17	6.770E-01	(P	2.557E-01	1.09E-01	G K
		1620.56	6.316E-01	(P	5.655E-01	2.32E-01	G
		785.42	-3.792E-02	% P	1.578E+00	4.52E-01	G
BI-214	4.5483E-01						
		609.32	4.564E-01	(P	7.606E-02	3.98E-02	G K
		1764.51	6.147E-01	+ P	5.084E-02	6.55E-02	G
		1120.28	4.499E-01	(P	2.550E-01	1.07E-01	G
RA-224	1.0939E+00						
		241.00	1.094E+00	?(P	8.688E-01	2.71E-01	G
RA-226	1.0499E+00						
		185.99	1.050E+00	*(	7.540E-01	2.59E-01	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments

AC-228       6.8257E-01
                          911.07 6.683E-01  (P 1.128E-01 5.80E-02 G K
                          968.90 6.858E-01  (P 1.410E-01 6.54E-02 G
                          338.40 7.124E-01  (P 2.309E-01 9.82E-02 G

TH-227      -1.4315E-01
                          236.00-1.431E-01 %(P 3.053E-01 9.25E-02 G K
                          256.25 2.214E-02 & P 3.584E-01 1.06E-01 G

PA-234       1.9825E-02
                           98.44 1.983E-02 %(  9.557E-02 2.86E-02 G K
                          946.00-1.288E-02 %   1.675E-01 4.85E-02 G
                          131.28-1.716E-02 %   1.620E-01 4.85E-02 G
                           94.67-6.677E-02 %   2.506E-01 7.55E-02 G
                          883.24-7.442E-02 &   2.628E-01 7.79E-02 G
                          926.70 8.137E-02 &   2.581E-01 7.66E-02 G
                          569.26 3.502E-04 %   2.353E-01 6.77E-02 G

TH-234       7.1031E-01
                           63.29 5.171E-01 %(P 1.647E+00 4.95E-01 G K
                           92.80 9.615E-01  (P 1.299E+00 3.96E-01 G
                           92.38-2.207E-01 % P 1.538E+00 4.59E-01 G

AM-241      -3.8701E-02
                           59.54-3.870E-02 %(P 2.077E-01 6.23E-02 G
   ( - This peak used in the nuclide activity average.

   * - Peak is too wide, but only one peak in library.
   ! - Peak is part of a multiplet and this area went
       negative during deconvolution.
   ? - Peak is too narrow.
   @ - Peak is too wide at FW25M, but ok at FWHM.
   % - Peak fails sensitivity test.
   $ - Peak identified, but first peak of this nuclide
       failed one or more qualification tests.
   + - Peak activity higher than counting uncertainty range.
   - - Peak activity lower than counting uncertainty range.
   = - Peak outside analysis energy range.
   & - Calculated peak centroid is not close enough to the
       library energy centroid for positive identification.
   P - Peakbackground subtraction
   } - Peak is too close to another for the activity
       to be found directly.

   Nuclide Codes:                      Peak Codes:
   T - Thermal Neutron Activation      G - Gamma Ray
   F - Fast Neutron Activation         X - X-Ray
```

I - Fission Product
N - Naturally Occurring Isotope
P - Photon Reaction
C - Charged Particle Reaction
M - No MDA Calculation
R - Coincidence Corrected
H - Halflife limit exceeded

P - Positron Decay
S - Single-Escape
D - Double-Escape
K - Key Line
A - Not in Average
C - Coincidence Peak

- -

***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	2.2056E-02	2.2477E-02	2.2533E-01	2.2533E-01	2.516E-01
K-40		1.3671E+01	1.3671E+01	1.0686E+00	1.3394E+00	
MN-54	#A	1.8778E-02	1.8839E-02	2.3483E-02	2.3509E-02	2.483E-02
CO-57	#B	-8.3327E-03	-8.3639E-03	3.2565E-02	3.2569E-02	3.542E-02
CO-60	#B	-8.4553E-03	-8.4597E-03	6.6723E-02	6.6725E-02	3.443E-02
Sr-85	#A	-1.1721E-02	-1.1905E-02	3.1011E-02	3.1019E-02	3.388E-02
Kr-85	#A	-3.0068E+02	-3.0068E+02	8.6158E+02	8.6177E+02	7.864E+02
Y-88	#B	2.2112E-05	2.2322E-05	1.5265E-02	1.5265E-02	2.003E-02
NB-94	#B	-6.8019E-03	-6.8019E-03	2.6048E-02	2.6051E-02	2.880E-02
Ag-108M	#B	-2.2236E-03	-2.2237E-03	2.9174E-02	2.9175E-02	3.350E-02
CD-109	#A	5.0060E-01	5.0172E-01	1.0106E+00	1.0109E+00	1.109E+00
SN-113	#B	4.8835E-03	4.9266E-03	3.4729E-02	3.4730E-02	3.898E-02
SB-125	#B	6.4993E-02	6.5058E-02	5.9661E-02	5.9785E-02	8.374E-02
I-131	#B	1.7581E-03	1.9935E-03	2.0363E-02	2.0364E-02	2.063E-02
CS-134	#B	1.7829E-02	1.7853E-02	1.4184E-02	1.4224E-02	6.160E-02
CS-137	#	4.8030E-02	4.8035E-02	4.3543E-02	4.3635E-02	
CE-139	#A	-7.0826E-03	-7.1348E-03	3.3311E-02	3.3314E-02	3.585E-02
EU-152	#B	-2.0124E-02	-2.0128E-02	9.0031E-02	9.0038E-02	9.905E-02
EU-154	#B	-1.5279E-02	-1.5284E-02	7.3822E-02	7.3826E-02	7.907E-02
EU-155	#B	7.7691E-02	7.7734E-02	1.1906E-01	1.1913E-01	1.303E-01
HG-203	#B	-5.4552E-03	-5.5748E-03	3.3768E-02	3.3770E-02	3.165E-02
TL-208	#	2.5072E-01	2.5072E-01	5.6750E-02	5.8650E-02	
PB-212	#	6.2396E-01	6.2396E-01	8.8423E-02	9.5795E-02	7.503E-02
PB-214	#	4.6960E-01	4.6960E-01	7.8819E-02	8.3556E-02	6.124E-02
BI-212		6.6840E-01	6.6840E-01	3.2264E-01	3.2504E-01	
BI-214		4.5483E-01	4.5483E-01	1.1886E-01	1.2186E-01	
RA-224	#	1.0939E+00	1.0939E+00	8.1397E-01	8.1653E-01	8.688E-01
RA-226	#	1.0499E+00	1.0499E+00	7.7536E-01	7.7783E-01	
AC-228		6.8257E-01	6.8257E-01	1.2885E-01	1.3501E-01	
TH-227	#B	-1.4315E-01	-1.4315E-01	2.7992E-01	2.8005E-01	3.053E-01
PA-234	#B	1.9825E-02	1.9825E-02	8.5767E-02	8.5774E-02	9.557E-02
TH-234	#B	7.1031E-01	7.1031E-01	8.7729E-01	8.7817E-01	1.647E+00
AM-241	#A	-3.8701E-02	-3.8701E-02	1.9542E-01	1.9543E-01	2.077E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (1120.2 to 2000.1 keV) 1.6825138E+01 pCi/gm
Total Decayed Activity (1120.2 to 2000.1 keV) 1.6825146E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
DAT

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 107F_25JUL2006_1926.An1

Sample description
FSS-OOL-05-05-012-F

Spectrum Filename: C:\GammaVision\Spectra\107F_25JUL2006_1926.An1

Acquisition information
Start time: 25-Jul-2006 19:26:23
Live time: 2000
Real time: 2002
Dead time: 0.12 %
Detector ID: 2

Detector system
Det 107- DSPE- 634

Calibration
Filename: D7_1LSa.Clb
Detector 107 Calibration for 1 Liter Sand Marinelli

Energy Calibration
Created: 29-Oct-2004 06:48:53
Zero offset: 0.157 keV
Gain: 0.500 keV/channel
Quadratic: -1.676E-08 keV/channel^2

Efficiency Calibration
Created: 29-Oct-2004 06:51:32
Type: Polynomial
Uncertainty: 1.174 %
Coefficients: -0.279532 -4.778179 0.614896
-0.087174 0.005356 -0.000131

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.16keV)
Stop channel: 4000 (2000.15keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 1.8820E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.8820E+03) =
5.3135E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	24-Jul-2006 09:45:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	107_150K_28APR05.Pbc 01-May-2005 05:30:33
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 20 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.1405

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
74.79	341.	12.80	1.18	2.842E-02	74.81	9.600	8.843E-01	PB212
77.09	564.	8.17	1.18	2.951E-02	77.11	10.700	1.268E+00	PB214
					77.11	17.500	7.819E-01	PB212
86.43	125.	33.50	1.19	3.283E-02				
86.43	125.	33.50	1.19	3.283E-02	86.45	32.740	8.365E-02	EU155
					88.04	3.790	PBC<MDA	CD109
89.71	180.	21.51	1.19	3.368E-02				
89.71	180.	21.51	1.19	3.368E-02	92.38	2.570	1.398E+00	TH234
93.36	190.	19.59	1.19	3.450E-02	92.80	3.000	PBC<MDA	TH234
129.84	145.	34.14	0.69	3.820E-02				
159.73	114.	39.39	1.75	3.772E-02				
186.53	244.	18.30	1.41	3.606E-02	185.99	3.280	1.477E+00	RA226
209.15	141.	27.59	1.87	3.430E-02				
238.77	1251.	3.55	1.30	3.188E-02	238.63	43.100	6.454E-01	PB212
241.70	217.	15.31	1.30	3.165E-02	241.00	3.900	1.248E+00	RA224
					241.92	7.470	6.554E-01	PB214
270.87	98.	33.88	1.06	2.940E-02				
295.38	317.	8.18	1.34	2.768E-02	295.22	19.200	4.224E-01	PB214
300.49	83.	25.33	1.34	2.733E-02				
328.25	92.	31.35	1.47	2.559E-02				
338.58	363.	9.75	1.58	2.499E-02	338.40	12.010	8.610E-01	AC228
352.15	613.	7.41	1.42	2.425E-02	351.99	37.100	4.847E-01	PB214
463.57	114.	25.44	1.73	1.953E-02	463.51	10.000	4.100E-01	SB125
511.15	205.	11.31	1.61	1.807E-02	510.72	22.500	3.024E-01	TL208
583.51	526.	6.49	1.60	1.628E-02	583.14	86.000	2.673E-01	TL208
609.58	404.	6.18	1.81	1.574E-02	609.32	46.090	3.955E-01	BI214
661.66	68.	37.91	0.74	1.477E-02	661.62	84.620	PBC<MDA	CS137

727.41	128.	19.42	1.86	1.374E-02	727.17	11.800	5.611E-01	BI212
795.46	59.	28.65	1.36	1.284E-02				
795.46	59.	28.65	1.36	1.284E-02	795.76	85.400	3.834E-02	CS134
911.51	317.	9.09	2.16	1.160E-02	911.07	29.000	6.663E-01	AC228
964.62	71.	18.84	1.80	1.113E-02	964.00	14.580	3.121E-01	EU152
969.42	199.	8.79	1.80	1.109E-02	968.90	17.460	7.302E-01	AC228
1121.03	132.	19.43	1.42	9.965E-03	1120.28	15.040	6.274E-01	BI214
1461.21	1815.	2.37	2.08	8.189E-03	1460.75	10.700	1.483E+01	K40

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
1765.27	89.	11.68	1.59	7.081E-03	1764.51	15.920	5.597E-01	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
172.52	86.42	817.	125.	0.063	100.50	1.186	BI-207	lD
179.09	89.71	656.	180.	0.090	64.54	1.189	PB-214	lD
319.11	159.73	715.	125.	0.062	94.92	1.749	BA-140	s
417.93	209.15	568.	141.	0.070	82.77	1.873	AC-228	s
541.38	270.87	398.	98.	0.049	101.64	1.057	AC-228	
600.25	300.32	223.	77.	0.038	91.36	1.225	PB-212	M
656.13	328.25	283.	92.	0.046	94.04	1.466	RH-106M	
1929.58	964.54	53.	71.	0.035	56.48	1.797	AC-228	D

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.
M - Peak is close to a library peak.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-212	149.29	74.81	784.	337.	0.168	38.38	1.178D
PB-212	153.89	77.11	777.	465.	0.233	23.38	1.179A
TH-234	185.94	93.14	1421.	149.	0.075	96.70	1.500s
RA-226	372.70	186.53	670.	244.	0.122	54.89	1.410s
TH-227	471.91	236.14	1149.	-140.	-0.070	106.31	1.500s
PB-212	476.89	238.63	313.	1236.	0.618	10.30	1.297D
RA-224	483.00	241.68	948.	133.	0.066	100.15	1.500
PB-214	483.47	241.92	497.	197.	0.098	52.15	1.299D
PB-214	590.03	295.20	288.	313.	0.156	30.27	1.429
AC-228	676.78	338.58	291.	360.	0.180	29.26	1.576s
PB-214	703.91	352.15	359.	607.	0.304	22.24	1.423
SB-125	926.37	463.39	138.	81.	0.040	67.63	1.500s
TL-208	1021.89	511.15	162.	171.	0.086	33.94	1.614s
TL-208	1166.61	583.51	173.	521.	0.261	19.46	1.598s
BI-214	1218.74	609.58	95.	400.	0.200	18.53	1.806
CS-137	1322.89	661.66	181.	65.	0.032	113.72	0.744s
BI-212	1454.39	727.41	145.	127.	0.063	58.25	1.856s
CS-134	1590.06	795.25	78.	49.	0.025	86.48	1.684
AC-228	1822.58	911.51	139.	312.	0.156	27.26	2.157s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
AC-228	1937.36	968.90	73.	197.	0.098	27.81	1.799D
BI-214	2241.62	1121.03	123.	131.	0.066	58.30	1.420s
K-40	2922.02	1461.21	17.	1810.	0.905	7.12	2.082
BI-214	3530.19	1765.27	6.	88.	0.044	35.03	1.590s

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	Peak MDA Value pCi/gm	COMMENTS
BE-7		6.5544E-02					
			477.56	6.554E-02	%(	2.325E-01 6.93E-02 G	
K-40		1.4831E+01					
			1460.75	1.483E+01	(P	1.784E-01 3.53E-01 G	
MN-54		1.1625E-03					
			834.81	1.162E-03	%(P	3.575E-02 1.04E-02 G	
CO-57		7.4373E-03					
			122.07	7.437E-03	&(P	3.236E-02 9.72E-03 G K	
			136.43	-7.095E-02	% P	2.793E-01 8.41E-02 G	
CO-60		-5.7269E-03					
			1332.51	-5.727E-03	&(P	2.986E-02 8.22E-03 G K	
			1173.23	3.257E-03	% P	3.347E-02 9.55E-03 G K	
Sr-85		-9.7791E-03					
			514.00	-9.779E-03	%(	3.234E-02 9.69E-03 G	
Kr-85		-2.5008E+02					
			513.99	-2.501E+02	%(P	7.392E+02 2.20E+02 G	
Y-88		-4.7583E-03					
			1836.01	-4.758E-03	%(P	1.960E-02 5.30E-03 G K	
			898.02	-5.546E-03	% P	2.928E-02 8.44E-03 G	
NB-94		-5.9817E-03					
			871.10	-5.982E-03	&(P	2.527E-02 7.41E-03 G K	
			702.50	5.197E-03	% P	2.408E-02 7.07E-03 G K	
Ag-108M		-1.7489E-02					
			722.95	-1.749E-02	%(	4.003E-02 1.21E-02 G K	
			614.37	-2.209E-02	%	3.676E-02 1.12E-02 G	

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
		433.93	-8.610E-03	% P	2.657E-02	7.91E-03	G
CD-109	7.4324E-01						
		88.04	7.432E-01	%(P	1.028E+00	3.14E-01	G
SN-113	-1.5002E-03						
		391.71	-1.500E-03	%(P	2.667E-02	7.64E-03	G K
		255.04	4.007E-01	%	1.041E+00	3.14E-01	G
SB-125	7.6768E-02						
		427.95	2.510E-03	&(P	7.670E-02	2.23E-02	G K
		600.77	-3.542E-02	& P	1.352E-01	3.98E-02	G
		636.15	-1.268E-02	& P	2.259E-01	6.53E-02	G
		463.51	2.966E-01	(P	2.113E-01	6.92E-02	G
		176.29	-1.283E-02	% P	4.486E-01	1.34E-01	G
I-131	5.2822E-03						
		364.48	5.282E-03	&(	3.037E-02	8.99E-03	G K
		636.97	-2.456E-02	&	3.800E-01	1.10E-01	G
		284.29	-2.289E-03	&	4.351E-01	1.28E-01	G
CS-134	1.4605E-02						
		604.66	-7.568E-04	&(P	5.910E-02	1.76E-02	G K
		795.76	3.216E-02	(P	2.874E-02	9.37E-03	G
		569.29	2.602E-02	&	1.584E-01	4.66E-02	G
		801.84	-6.882E-02	% P	3.224E-01	9.47E-02	G
CS-137	3.7267E-02						
		661.62	3.727E-02	(P	3.759E-02	1.49E-02	G
CE-139	-2.7936E-03						
		165.85	-2.794E-03	&(P	2.828E-02	8.42E-03	G
EU-152	1.9671E-03						
		121.78	1.967E-03	%(P	1.013E-01	3.02E-02	G K
		344.30	-3.575E-02	% P	9.012E-02	2.71E-02	G
		1408.08	-3.862E-02	% P	1.277E-01	3.71E-02	G
		964.00	-6.324E-03	& P	3.021E-01	8.82E-02	G
		1112.07	-9.787E-03	% P	2.927E-01	8.45E-02	G
		778.90	-6.339E-02	% P	2.285E-01	6.77E-02	G
EU-154	-1.7320E-02						
		123.10	-1.732E-02	&(P	6.891E-02	2.07E-02	G K
		1274.80	-2.322E-02	% P	9.178E-02	2.69E-02	G
		723.30	-8.573E-02	% P	1.844E-01	5.58E-02	G
		1004.80	-2.865E-03	% P	1.647E-01	4.69E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
EU-155	7.9676E-02						
		86.45	7.968E-02	%(	1.270E-01	3.87E-02	G K
		105.31	-3.455E-03	% P	1.467E-01	4.38E-02	G
HG-203	-4.0462E-04						
		279.17	-4.046E-04	%(P	3.117E-02	9.19E-03	G K
		72.87	-2.803E-01	% P	9.556E-01	2.88E-01	G
		70.83	-7.234E-03	%	1.183E+00	3.53E-01	G
		82.50	-6.167E-01	%	1.939E+00	5.86E-01	G
TL-208	2.7456E-01						
		583.14	2.673E-01	*(P	3.276E-02	1.75E-02	G
		510.72	3.024E-01	@(P	1.094E-01	4.10E-02	G
PB-212	6.4549E-01						
		238.63	6.455E-01	(P	4.449E-02	2.24E-02	G K
							Energy duplication
		77.11	6.455E-01	}	1.840E-01	5.03E-02	G
		74.81	8.845E-01	+ P	3.496E-01	1.14E-01	G
PB-214	4.6361E-01						
		351.99	4.847E-01	(P	7.256E-02	3.62E-02	G K
		295.22	4.229E-01	(P	1.105E-01	4.33E-02	G
							Energy duplication
		77.11	2.103E-01	} P	3.922E-01	1.15E-01	G
		241.92	5.986E-01	+ P	3.239E-01	1.05E-01	G
BI-212	5.6106E-01						
		727.17	5.611E-01	*(P	2.607E-01	1.10E-01	G K
		1620.56	3.128E-01	% P	7.339E-01	2.19E-01	G
		785.42	4.097E-01	% P	1.421E+00	4.21E-01	G
BI-214	3.9554E-01						
		609.32	3.955E-01	(P	4.771E-02	2.47E-02	G K
		1764.51	5.597E-01	+ P	9.051E-02	6.60E-02	G
		1120.28	6.274E-01	+ P	2.604E-01	1.23E-01	G
RA-224	7.6996E-01						
		241.00	7.700E-01	?(P	8.488E-01	2.61E-01	G
RA-226	1.4772E+00						
		185.99	1.477E+00	*(	7.481E-01	2.71E-01	G
AC-228	7.2533E-01						
		911.07	6.663E-01	(P	1.228E-01	6.14E-02	G K
		968.90	7.301E-01	(P	1.577E-01	6.84E-02	G
		338.40	8.610E-01	*(P	1.965E-01	8.47E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TH-227	-2.7868E-01						
		236.00	-2.787E-01	?(P	3.208E-01	9.86E-02	G K
		256.25	-5.468E-02	% P	3.676E-01	1.09E-01	G
PA-234	-5.7229E-04						
		98.44	-5.723E-04	&(	1.282E-01	3.82E-02	G K
		946.00	0.000E+00	%	1.816E-01	5.25E-02	G
		131.28	2.163E-02	&	1.490E-01	4.47E-02	G
		94.67	-3.563E-04	%	2.209E-01	6.59E-02	G
		883.24	7.252E-02	%	2.169E-01	6.46E-02	G
		926.70	4.712E-02	%	2.453E-01	7.17E-02	G
		569.26	3.777E-02	&	2.349E-01	6.90E-02	G
TH-234	7.4908E-01						
		63.29	5.253E-01	%(P	1.612E+00	4.85E-01	G K
		92.80	1.040E+00	(P	1.242E+00	3.79E-01	G
		92.38	9.589E-02	% P	1.385E+00	4.14E-01	G
AM-241	-2.4119E-02						
		59.54	-2.412E-02	%(P	2.179E-01	6.53E-02	G

(- This peak used in the nuclide activity average.

* - Peak is too wide, but only one peak in library.
! - Peak is part of a multiplet and this area went negative during deconvolution.
? - Peak is too narrow.
@ - Peak is too wide at FW25M, but ok at FWHM.
% - Peak fails sensitivity test.
$ - Peak identified, but first peak of this nuclide failed one or more qualification tests.
\+ - Peak activity higher than counting uncertainty range.
\- - Peak activity lower than counting uncertainty range.
= - Peak outside analysis energy range.
& - Calculated peak centroid is not close enough to the library energy centroid for positive identification.
P - Peakbackground subtraction
} - Peak is too close to another for the activity to be found directly.

Nuclide Codes:	Peak Codes:
T - Thermal Neutron Activation	G - Gamma Ray
F - Fast Neutron Activation	X - X-Ray
I - Fission Product	P - Positron Decay
N - Naturally Occurring Isotope	S - Single-Escape
P - Photon Reaction	D - Double-Escape
C - Charged Particle Reaction	K - Key Line
M - No MDA Calculation	A - Not in Average

R - Coincidence Corrected C - Coincidence Peak
H - Halflife limit exceeded

- -

***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	6.4360E-02	6.5544E-02	2.0785E-01	2.0789E-01	2.283E-01
K-40		1.4831E+01	1.4831E+01	1.0588E+00	1.3742E+00	
MN-54	#A	1.1588E-03	1.1625E-03	3.1187E-02	3.1187E-02	3.564E-02
CO-57	#B	7.4105E-03	7.4373E-03	2.9169E-02	2.9172E-02	3.225E-02
CO-60	#B	-5.7240E-03	-5.7269E-03	8.2070E-02	8.2071E-02	2.985E-02
Sr-85	#A	-9.6335E-03	-9.7791E-03	2.9059E-02	2.9064E-02	3.186E-02
Kr-85	#A	-2.5008E+02	-2.5008E+02	8.2582E+02	8.2595E+02	7.392E+02
Y-88	#B	-4.7151E-03	-4.7583E-03	2.2946E-02	2.2948E-02	1.943E-02
NB-94	#B	-5.9817E-03	-5.9817E-03	2.2854E-02	2.2856E-02	2.527E-02
Ag-108M	#B	-1.7488E-02	-1.7489E-02	3.6294E-02	3.6308E-02	4.003E-02
CD-109	#A	7.4164E-01	7.4324E-01	9.4264E-01	9.4354E-01	1.026E+00
SN-113	#B	-1.4875E-03	-1.5002E-03	9.4960E-02	9.4960E-02	2.645E-02
SB-125	#F	7.6694E-02	7.6768E-02	5.3728E-02	5.3919E-02	7.662E-02
I-131	#B	4.6801E-03	5.2822E-03	2.6979E-02	2.6981E-02	2.690E-02
CS-134	#B	1.4586E-02	1.4605E-02	1.2766E-02	1.2795E-02	5.902E-02
CS-137	A	3.7264E-02	3.7267E-02	4.4687E-02	4.4741E-02	
CE-139	#A	-2.7739E-03	-2.7936E-03	2.6795E-02	2.6795E-02	2.808E-02
EU-152	#B	1.9667E-03	1.9671E-03	9.0685E-02	9.0685E-02	1.013E-01
EU-154	#B	-1.7314E-02	-1.7320E-02	6.3989E-02	6.3996E-02	6.889E-02
EU-155	#B	7.9633E-02	7.9676E-02	1.1603E-01	1.1612E-01	1.269E-01
HG-203	#B	-3.9626E-04	-4.0462E-04	7.1402E-02	7.1402E-02	3.053E-02
TL-208	#	2.7456E-01	2.7456E-01	5.3900E-02	5.6287E-02	
PB-212		6.4549E-01	6.4549E-01	6.7336E-02	7.7379E-02	
PB-214		4.6361E-01	4.6361E-01	8.8139E-02	9.2294E-02	
BI-212	#	5.6106E-01	5.6106E-01	3.3012E-01	3.3178E-01	
BI-214		3.9554E-01	3.9554E-01	7.4070E-02	7.7666E-02	
RA-224	#A	7.6996E-01	7.6996E-01	7.8412E-01	7.8543E-01	8.488E-01
RA-226	#	1.4772E+00	1.4772E+00	8.1083E-01	8.1551E-01	
AC-228		7.2533E-01	7.2533E-01	1.1907E-01	1.2654E-01	
TH-227	#A	-2.7868E-01	-2.7868E-01	2.9684E-01	2.9730E-01	3.208E-01
PA-234	#B	-5.7229E-04	-5.7229E-04	1.1471E-01	1.1471E-01	1.282E-01
TH-234	#B	7.4908E-01	7.4908E-01	8.1997E-01	8.2102E-01	1.612E+00
AM-241	#A	-2.4119E-02	-2.4119E-02	2.0919E-01	2.0920E-01	2.179E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.

H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (1120.2 to 2000.1 keV) 1.9411118E+01 pCi/gm
Total Decayed Activity (1120.2 to 2000.1 keV) 1.9411123E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
DAT

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 107F_25JUL2006_2003.An1

Sample description
FSS-OOL-05-05-005-F

Spectrum Filename: C:\GammaVision\Spectra\107F_25JUL2006_2003.An1

Acquisition information
Start time: 25-Jul-2006 20:03:11
Live time: 2000
Real time: 2002
Dead time: 0.12 %
Detector ID: 2

Detector system
Det 107- DSPE- 634

Calibration
Filename: D7_1LSa.Clb
Detector 107 Calibration for 1 Liter Sand Marinelli

Energy Calibration
Created: 29-Oct-2004 06:48:53
Zero offset: 0.157 keV
Gain: 0.500 keV/channel
Quadratic: -1.676E-08 keV/channel^2

Efficiency Calibration
Created: 29-Oct-2004 06:51:32
Type: Polynomial
Uncertainty: 1.174 %
Coefficients: -0.279532 -4.778179 0.614896
-0.087174 0.005356 -0.000131

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.16keV)
Stop channel: 4000 (2000.15keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 1.9840E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.9840E+03) =
5.0403E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	24-Jul-2006 10:08:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	107_150K_28APR05.Pbc 01-May-2005 05:30:33
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 23 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.1394

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
74.77	430.	10.21	1.18	2.849E-02	74.81	9.600	1.070E+00	PB212
77.07	393.	9.54	1.18	2.957E-02	77.11	17.500	7.396E-01	PB212
					77.11	10.700	1.199E+00	PB214
77.29	147.	34.91	1.50	2.957E-02	77.11	17.500	PBC<MDA	PB212
					77.11	10.700	PBC<MDA	PB214
84.11	133.	29.56	1.18	3.224E-02	82.50	2.240	1.306E+00	HG203
86.98	215.	17.82	1.19	3.306E-02	86.45	32.740	1.361E-01	EU155
90.07	205.	18.42	1.19	3.384E-02	88.04	3.790	1.107E+00	CD109
93.33	257.	15.08	1.19	3.455E-02	92.38	2.570	1.926E+00	TH234
					92.80	3.000	1.568E+00	TH234
129.46	176.	34.85	1.55	3.819E-02				
129.46	176.	34.85	1.55	3.819E-02	131.28	20.000	1.571E-01	PA234
185.61	269.	19.45	1.46	3.613E-02				
185.61	269.	19.45	1.46	3.613E-02	185.99	3.280	1.546E+00	RA226
209.60	181.	25.45	1.54	3.426E-02				
238.78	1462.	3.14	1.30	3.188E-02	238.63	43.100	7.166E-01	PB212
241.99	208.	16.28	1.30	3.163E-02	241.00	3.900	1.132E+00	RA224
					241.92	7.470	5.945E-01	PB214
277.01	74.	29.75	0.98	2.895E-02				
295.37	304.	8.67	1.34	2.768E-02	295.22	19.200	3.837E-01	PB214
301.01	84.	26.58	1.34	2.730E-02				
328.42	78.	30.80	1.34	2.558E-02				
338.40	249.	13.88	1.82	2.500E-02	338.40	12.010	5.579E-01	AC228
352.15	530.	7.21	1.38	2.425E-02	351.99	37.100	3.972E-01	PB214
463.40	90.	18.73	1.54	1.953E-02				
463.40	90.	18.73	1.54	1.953E-02	463.51	10.000	3.051E-01	SB125
511.17	224.	12.66	1.85	1.807E-02	510.72	22.500	3.180E-01	TL208

583.27	536.	6.86	1.73	1.629E-02	583.14	86.000	2.582E-01	TL208
609.44	489.	6.39	1.83	1.574E-02	609.32	46.090	4.548E-01	BI214
727.36	128.	17.15	1.51	1.374E-02	723.30	19.700	3.197E-01	EU154
					727.17	11.800	5.322E-01	BI212
795.40	45.	34.11	1.68	1.284E-02	795.76	85.400	PBC<MDA	CS134
911.71	365.	7.25	1.82	1.160E-02	911.07	29.000	7.292E-01	AC228
934.23	66.	26.22	0.97	1.139E-02				

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
968.30	305.	9.52	2.14	1.110E-02	968.90	17.460	1.065E+00	AC228
1120.81	133.	20.09	2.20	9.966E-03	1120.28	15.040	6.019E-01	BI214
1461.22	1803.	2.42	2.19	8.189E-03	1460.75	10.700	1.398E+01	K40
1620.68	20.	35.70	2.09	7.569E-03	1620.56	2.750	6.511E-01	BI212
1764.97	86.	10.78	1.87	7.082E-03	1764.51	15.920	5.140E-01	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
167.89	84.39	707.	133.	0.067	88.69	1.185	TA-182	D
173.62	87.26	625.	215.	0.107	53.47	1.187	PB-214	D
179.80	90.35	609.	205.	0.102	55.27	1.189	PB-214	D
186.33	93.62	624.	257.	0.129	45.25	1.191	U-235	D
258.58	129.46	1268.	151.	0.076	102.69	1.548	AC-228	s
418.83	209.60	697.	181.	0.091	76.36	1.538	NP-239	s
601.30	300.84	239.	101.	0.051	74.20	2.122	PB-212	s
656.45	328.42	224.	78.	0.039	92.40	1.342	RH-106M	
1868.03	934.23	70.	66.	0.033	64.78	0.967	BI-214	s

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
HG-203	145.74	73.04	1767.	-147.	-0.074	123.49	1.500s
PB-212	149.29	74.81	766.	430.	0.215	30.62	1.178D
PB-212	153.89	77.11	832.	393.	0.197	28.63	1.179A
PB-214	153.89	77.11	1443.	147.	0.074	104.72	1.500A
EU-155	174.28	87.31	1651.	148.	0.074	119.38	1.500
TH-234	185.88	93.11	1514.	213.	0.106	73.27	1.500s
RA-226	371.75	186.06	821.	172.	0.086	74.24	1.500s
PB-212	476.89	238.63	277.	1446.	0.723	9.14	1.297D
RA-224	483.43	241.90	968.	118.	0.059	113.49	1.500
PB-214	483.47	241.92	473.	202.	0.101	49.94	1.299D
PB-214	590.03	295.20	341.	325.	0.163	31.54	1.544s
AC-228	676.42	338.40	330.	246.	0.123	41.65	1.816s
PB-214	703.92	352.15	315.	525.	0.262	21.63	1.380s
SB-125	926.25	463.33	118.	90.	0.045	57.92	1.500
TL-208	1021.93	511.17	214.	190.	0.095	37.97	1.848s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
TL-208	1166.11	583.27	203.	531.	0.266	20.57	1.731s
BI-214	1218.45	609.44	152.	484.	0.242	19.16	1.825
BI-212	1454.56	727.49	118.	99.	0.049	54.72	1.638
CS-134	1590.36	795.40	98.	45.	0.022	102.34	1.684
AC-228	1822.99	911.71	103.	360.	0.180	21.76	1.816s
AC-228	1936.15	968.30	130.	303.	0.151	28.55	2.139s
BI-214	2241.19	1120.81	143.	133.	0.066	60.26	2.204
K-40	2922.04	1461.22	35.	1798.	0.899	7.26	2.189
BI-212	3240.99	1620.68	10.	20.	0.010	107.10	2.085
BI-214	3529.58	1764.97	1.	85.	0.043	32.35	1.875

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

Nuclide Name	Nuclide Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	Peak MDA Value pCi/gm	COMMENTS
BE-7		1.2030E-01					
			477.56	1.203E-01	%(	2.045E-01 6.26E-02	G
K-40		1.3976E+01					
			1460.75	1.398E+01	(P	2.342E-01 3.39E-01	G
MN-54		-9.4025E-03					
			834.81	-9.403E-03	&(P	3.125E-02 9.29E-03	G
CO-57		1.6613E-04					
			122.07	1.661E-04	&(P	3.432E-02 1.02E-02	G K
			136.43	2.309E-03	% P	2.654E-01 7.92E-02	G
CO-60		9.7282E-03					
			1332.51	9.728E-03	%(P	2.582E-02 7.55E-03	G K
			1173.23	1.441E-02	% P	3.621E-02 1.08E-02	G K
Sr-85		-1.2586E-02					
			514.00	-1.259E-02	%(	3.214E-02 9.69E-03	G
Kr-85		-3.1267E+02					
			513.99	-3.127E+02	%(P	7.344E+02 2.20E+02	G
Y-88		1.6485E-03					
			1836.01	1.648E-03	%(P	1.883E-02 4.97E-03	G K
			898.02	-6.403E-03	% P	3.403E-02 9.92E-03	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
NB-94	8.8476E-03						
		871.10	8.848E-03	%(P	2.430E-02	7.26E-03	G K
		702.50	-1.061E-04	& P	2.889E-02	8.36E-03	G K
Ag-108M	7.9516E-04						
		722.95	7.952E-04	&(	2.457E-02	7.04E-03	G K
		614.37	-1.514E-02	%	3.528E-02	1.07E-02	G
		433.93	2.431E-03	& P	2.301E-02	6.73E-03	G
CD-109	1.9522E-01						
		88.04	1.952E-01	%(P	1.064E+00	3.20E-01	G
SN-113	-1.6173E-03						
		391.71	-1.617E-03	%(P	3.213E-02	9.33E-03	G K
		255.04	-1.292E-01	%	1.229E+00	3.66E-01	G
SB-125	9.1226E-02						
		427.95	1.536E-02	%(P	7.119E-02	2.11E-02	G K
		600.77	5.906E-02	% P	1.022E-01	3.13E-02	G
		636.15	8.149E-02	% P	1.995E-01	6.00E-02	G
		463.51	3.158E-01	(P	1.864E-01	6.29E-02	G
		176.29	-1.530E-02	% P	4.116E-01	1.22E-01	G
I-131	7.0005E-03						
		364.48	7.001E-03	%(	2.907E-02	8.65E-03	G K
		636.97	1.410E-01	%	3.305E-01	9.96E-02	G
		284.29	1.407E-01	%	3.932E-01	1.18E-01	G
CS-134	7.8065E-03						
		604.66	-9.852E-03	%(P	3.023E-02	9.04E-03	G K
		795.76	2.799E-02	(P	3.043E-02	9.66E-03	G
		569.29	0.000E+00	%	1.720E-01	5.00E-02	G
		801.84	-2.361E-03	% P	3.037E-01	8.70E-02	G
CS-137	2.7047E-03						
		661.62	2.705E-03	&(P	3.135E-02	9.09E-03	G
CE-139	4.7237E-03						
		165.85	4.724E-03	%(P	3.341E-02	1.00E-02	G
EU-152	-1.3935E-03						
		121.78	-1.394E-03	&(P	9.937E-02	2.97E-02	G K
		344.30	-1.298E-02	& P	7.087E-02	2.09E-02	G
		1408.08	2.200E-02	% P	1.065E-01	3.04E-02	G
		964.00	-9.075E-03	& P	3.671E-01	1.08E-01	G
		1112.07	-2.276E-02	% P	2.615E-01	7.57E-02	G
		778.90	-2.063E-03	& P	2.327E-01	6.72E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
EU-154	-3.6775E-03						
		123.10	-3.678E-03	%(P	7.337E-02	2.19E-02	G K
		1274.80	2.198E-02	% P	8.706E-02	2.56E-02	G
		723.30	1.052E-01	& P	1.595E-01	4.91E-02	G
		1004.80	2.262E-02	% P	1.743E-01	5.07E-02	G
EU-155	9.3550E-02						
		86.45	9.355E-02	&(	1.217E-01	3.72E-02	G K
		105.31	2.500E-02	% P	1.437E-01	4.32E-02	G
HG-203	-8.3178E-03						
		279.17	-8.318E-03	%(P	2.952E-02	8.84E-03	G K
		72.87	5.863E-03	% P	9.967E-01	2.99E-01	G
		70.83	-1.110E+00	+	1.495E+00	4.57E-01	G
		82.50	1.177E+00	%	1.746E+00	5.33E-01	G
TL-208	2.5820E-01						
		583.14	2.582E-01	@(P	3.359E-02	1.79E-02	G
		510.72	3.180E-01	+ P	1.187E-01	4.74E-02	G
PB-212	7.2329E-01						
		238.63	7.166E-01	(P	3.975E-02	2.21E-02	G K
							Energy duplication
		77.11	5.179E-01	}	1.805E-01	4.94E-02	G
		74.81	1.070E+00	+ P	3.280E-01	1.10E-01	G
PB-214	4.0405E-01						
		351.99	3.972E-01	*(P	6.466E-02	2.89E-02	G K
		295.22	4.172E-01	@(P	1.137E-01	4.45E-02	G
							Energy duplication
		77.11	3.169E-01	} P	3.869E-01	1.11E-01	G
		241.92	5.822E-01	+ P	3.000E-01	9.76E-02	G
BI-212	4.5965E-01						
		727.17	4.150E-01	?(P	2.239E-01	7.67E-02	G K
		1620.56	6.511E-01	(P	5.734E-01	2.38E-01	G
		785.42	5.520E-01	% P	1.308E+00	3.93E-01	G
BI-214	4.7001E-01						
		609.32	4.548E-01	(P	5.640E-02	2.93E-02	G K
		1764.51	5.140E-01	(P	4.451E-02	5.60E-02	G
		1120.28	6.019E-01	+ P	2.659E-01	1.22E-01	G
RA-224	6.4734E-01						
		241.00	6.473E-01	?(P	8.138E-01	2.50E-01	G
RA-226	9.9028E-01						
		185.99	9.903E-01	*(	7.838E-01	2.45E-01	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments

AC-228       7.2915E-01
                          911.07 7.292E-01 @(P 1.010E-01 5.35E-02 G K
                          968.90 1.065E+00 + P 1.966E-01 1.02E-01 G
                          338.40 5.579E-01 - P 1.982E-01 7.85E-02 G

TH-227      -1.9915E-01
                          236.00-1.992E-01 %(P 3.039E-01 9.27E-02 G K
                          256.25-1.558E-02 % P 3.372E-01 9.95E-02 G

PA-234      -5.8756E-02
                           98.44-5.876E-02 &(  1.226E-01 3.72E-02 G K
                          946.00 3.688E-02 &   1.245E-01 3.69E-02 G
                          131.28 2.301E-02 &   1.262E-01 3.78E-02 G
                           94.67-9.414E-02 %   2.062E-01 6.25E-02 G
                          883.24-5.550E-02 %   2.014E-01 5.95E-02 G
                          926.70 2.237E-02 &   2.305E-01 6.64E-02 G
                          569.26 0.000E+00 %   2.548E-01 7.41E-02 G

TH-234       7.5482E-01
                           63.29 2.555E-01 %(P 1.498E+00 4.49E-01 G K
                           92.80 1.404E+00  (P 1.215E+00 3.75E-01 G
                           92.38-6.985E-02 & P 1.458E+00 4.35E-01 G

AM-241       5.0092E-03
                           59.54 5.009E-03 %(P 1.918E-01 5.73E-02 G
   ( - This peak used in the nuclide activity average.

   * - Peak is too wide, but only one peak in library.
   ! - Peak is part of a multiplet and this area went
       negative during deconvolution.
   ? - Peak is too narrow.
   @ - Peak is too wide at FW25M, but ok at FWHM.
   % - Peak fails sensitivity test.
   $ - Peak identified, but first peak of this nuclide
       failed one or more qualification tests.
   + - Peak activity higher than counting uncertainty range.
   - - Peak activity lower than counting uncertainty range.
   = - Peak outside analysis energy range.
   & - Calculated peak centroid is not close enough to the
       library energy centroid for positive identification.
   P - Peakbackground subtraction
   } - Peak is too close to another for the activity
       to be found directly.

   Nuclide Codes:                      Peak Codes:
   T - Thermal Neutron Activation      G - Gamma Ray
   F - Fast Neutron Activation         X - X-Ray
```

I - Fission Product
N - Naturally Occurring Isotope
P - Photon Reaction
C - Charged Particle Reaction
M - No MDA Calculation
R - Coincidence Corrected
H - Halflife limit exceeded

P - Positron Decay
S - Single-Escape
D - Double-Escape
K - Key Line
A - Not in Average
C - Coincidence Peak

- -

***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	1.1811E-01	1.2030E-01	1.8789E-01	1.8803E-01	2.007E-01
K-40		1.3976E+01	1.3976E+01	1.0167E+00	1.3096E+00	
MN-54	#A	-9.3731E-03	-9.4025E-03	2.9313E-02	2.9319E-02	3.115E-02
CO-57	#B	1.6553E-04	1.6613E-04	3.0729E-02	3.0729E-02	3.419E-02
CO-60	#B	9.7232E-03	9.7282E-03	2.2662E-02	2.2669E-02	2.580E-02
Sr-85	#A	-1.2397E-02	-1.2586E-02	2.9071E-02	2.9080E-02	3.166E-02
Kr-85	#A	-3.1267E+02	-3.1267E+02	7.8271E+02	7.8293E+02	7.344E+02
Y-88	#B	1.6334E-03	1.6485E-03	1.4910E-02	1.4910E-02	1.866E-02
NB-94	#B	8.8476E-03	8.8476E-03	2.1779E-02	2.1785E-02	2.430E-02
Ag-108M	#B	7.9514E-04	7.9516E-04	2.1114E-02	2.1114E-02	2.457E-02
CD-109	#A	1.9480E-01	1.9522E-01	9.6047E-01	9.6053E-01	1.062E+00
SN-113	#B	-1.6036E-03	-1.6173E-03	9.3146E-02	9.3146E-02	3.186E-02
SB-125	#F	9.1137E-02	9.1226E-02	5.4479E-02	5.4744E-02	7.112E-02
I-131	#B	6.1975E-03	7.0005E-03	2.5964E-02	2.5967E-02	2.573E-02
CS-134	#B	7.7963E-03	7.8065E-03	8.0829E-03	8.0961E-03	3.019E-02
CS-137	#A	2.7044E-03	2.7047E-03	2.7271E-02	2.7271E-02	3.135E-02
CE-139	#A	4.6902E-03	4.7237E-03	3.0014E-02	3.0015E-02	3.317E-02
EU-152	#B	-1.3933E-03	-1.3935E-03	1.0054E-01	1.0054E-01	9.935E-02
EU-154	#B	-3.6763E-03	-3.6775E-03	7.4970E-02	7.4971E-02	7.335E-02
EU-155	#A	9.3499E-02	9.3550E-02	1.1168E-01	1.1180E-01	1.217E-01
HG-203	#B	-8.1447E-03	-8.3178E-03	2.9078E-02	2.9082E-02	2.891E-02
TL-208	#	2.5820E-01	2.5820E-01	5.3573E-02	5.5701E-02	
PB-212		7.2329E-01	7.2329E-01	6.6822E-02	7.9309E-02	
PB-214		4.0405E-01	4.0405E-01	7.8232E-02	8.1790E-02	
BI-212		4.5965E-01	4.5965E-01	2.5481E-01	2.5626E-01	2.239E-01
BI-214		4.7001E-01	4.7001E-01	8.9251E-02	9.3468E-02	
RA-224	#A	6.4734E-01	6.4734E-01	7.4865E-01	7.4962E-01	8.138E-01
RA-226	#	9.9027E-01	9.9028E-01	7.3517E-01	7.3749E-01	7.838E-01
AC-228		7.2915E-01	7.2915E-01	1.6050E-01	1.6618E-01	
TH-227	#B	-1.9915E-01	-1.9915E-01	2.7954E-01	2.7979E-01	3.039E-01
PA-234	#B	-5.8756E-02	-5.8756E-02	1.1155E-01	1.1160E-01	1.226E-01
TH-234	#B	7.5482E-01	7.5482E-01	6.0440E-01	6.0584E-01	1.498E+00
AM-241	#A	5.0092E-03	5.0092E-03	1.7181E-01	1.7181E-01	1.918E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (276.7 to 2000.1 keV) 1.7020491E+01 pCi/gm
Total Decayed Activity (276.7 to 2000.1 keV) 1.7020491E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
DAT

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 101_25JULY2006_0943.An1

Sample description
OOL-05-06-009-F-S WET

Spectrum Filename: C:\GammaVision\Spectra\101_25JULY2006_0943.An1

Acquisition information
Start time: 25-Jul-2006 09:44:39
Live time: 2000
Real time: 2002
Dead time: 0.09 %
Detector ID: 1

Detector system
Det 101- DSPE-633

Calibration
Filename: D1_1LSa.Clb
Detector 101 1.0 Liter Marinelli Sand

Energy Calibration
Created: 03-Sep-2004 08:50:48
Zero offset: 0.244 keV
Gain: 0.500 keV/channel
Quadratic: -2.493E-08 keV/channel^2

Efficiency Calibration
Created: 03-Sep-2004 08:52:26
Type: Polynomial
Uncertainty: 0.626 %
Coefficients: -0.321775 -5.816463 0.734234
-0.099357 0.006049 -0.000149

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.23keV)
Stop channel: 4000 (1999.11keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 1.8080E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.8080E+03) =
5.5310E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	24-Jul-2006 21:15:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	101_150K_28APR05.Pbc 01-May-2005 05:24:47
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 13 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.3464

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
74.73	202.	16.45	1.00	1.667E-02	74.81	9.600	9.250E-01	PB212
77.21	306.	10.66	1.01	1.737E-02	77.11	10.700	1.226E+00	PB214
					77.11	17.500	7.586E-01	PB212
84.21	56.	37.37	0.00	1.874E-02				
87.12	117.	23.23	1.01	1.920E-02	86.45	32.740	1.396E-01	EU155
					88.04	3.790	PBC<MDA	CD109
89.68	73.	39.83	1.02	1.954E-02				
93.34	122.	21.72	1.02	1.995E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
185.72	86.	33.40	0.89	1.860E-02				
185.72	86.	33.40	0.89	1.860E-02	185.99	3.280	1.058E+00	RA226
238.96	696.	4.46	1.12	1.555E-02	238.63	43.100	7.683E-01	PB212
					241.92	7.470	4.519E+00	PB214
242.11	93.	22.28	1.12	1.539E-02				
270.35	63.	28.99	0.90	1.400E-02				
295.56	135.	13.06	1.16	1.291E-02	295.22	19.200	4.027E-01	PB214
300.42	44.	35.14	1.16	1.272E-02				
338.93	122.	16.09	1.76	1.133E-02	338.40	12.010	6.592E-01	AC228
352.44	248.	9.70	0.97	1.091E-02	351.99	37.100	4.530E-01	PB214
511.11	125.	15.25	1.41	7.585E-03	510.72	22.500	4.778E-01	TL208
583.54	207.	9.52	1.38	6.680E-03	583.14	86.000	2.664E-01	TL208
609.80	194.	10.93	1.36	6.408E-03	609.32	46.090	4.865E-01	BI214
727.90	60.	20.76	2.21	5.443E-03	727.17	11.800	6.938E-01	BI212
795.41	29.	33.33	1.50	5.016E-03	795.76	85.400	PBC<MDA	CS134
861.15	45.	26.83	1.60	4.674E-03				
911.96	130.	13.53	1.35	4.443E-03	911.07	29.000	7.450E-01	AC228
969.08	87.	15.63	1.25	4.211E-03	968.90	17.460	8.789E-01	AC228

1120.40	50.	22.59	1.16	3.710E-03	1120.28	15.040	6.658E-01	BI214
1461.88	610.	4.20	1.91	2.940E-03	1460.75	10.700	1.442E+01	K40
1765.77	28.	20.02	2.11	2.481E-03	1764.51	15.920	5.295E-01	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
149.04	75.25	450.	202.	0.101	49.36	1.005	PB-214	D
153.99	77.73	377.	306.	0.153	31.97	1.007	PB-214	D
178.94	89.71	385.	73.	0.036	119.49	1.016	PB-214	lD
477.62	239.00	134.	696.	0.348	13.38	1.122	PB-212	D
483.91	242.15	167.	93.	0.046	66.85	1.124	PB-214	D
540.43	270.35	130.	63.	0.032	86.98	0.904	AC-228	
600.34	300.30	131.	47.	0.024	116.33	1.374	PB-212	s
1722.60	861.15	36.	45.	0.023	80.50	1.599	TL-208	s

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-212	149.29	74.86	1012.	189.	0.094	72.63	1.499s
PB-214	153.79	77.11	935.	265.	0.133	51.48	1.499D
PB-212	153.79	77.11	931.	269.	0.135	51.48	1.499D
EU-155	173.80	87.11	872.	104.	0.052	124.42	1.499
CD-109	173.73	87.08	729.	109.	0.055	108.20	1.499
TH-234	186.08	93.25	805.	122.	0.061	97.30	1.499
RA-226	371.88	186.11	416.	87.	0.043	105.05	1.499s
PB-212	477.60	238.95	364.	560.	0.280	18.98	1.499
RA-224	483.32	241.81	437.	80.	0.040	115.06	1.499
PB-214	590.73	295.49	199.	127.	0.064	53.22	1.499
AC-228	677.65	338.93	113.	120.	0.060	48.27	1.758s
PB-214	704.54	352.37	123.	223.	0.111	28.82	1.499
TL-208	1022.16	511.11	91.	109.	0.055	45.75	1.407s
TL-208	1167.09	583.54	65.	205.	0.102	28.55	1.376
BI-214	1219.64	609.80	74.	192.	0.096	32.79	1.364
BI-212	1455.96	727.90	36.	60.	0.030	62.28	2.206s
CS-134	1591.04	795.41	34.	29.	0.015	100.00	1.502
AC-228	1824.28	911.96	49.	129.	0.064	40.59	1.352
AC-228	1938.58	969.08	32.	86.	0.043	46.89	1.253
BI-214	2241.39	1120.40	29.	50.	0.025	67.78	1.159s
K-40	2924.77	1461.88	12.	608.	0.304	12.59	1.910
BI-214	3532.99	1765.77	2.	28.	0.014	60.05	2.106s

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	Peak MDA Value pCi/gm	COMMENTS
BE-7		5.9960E-02					
			477.56	5.996E-02	&(	3.893E-01 1.13E-01	G
K-40		1.4422E+01					
			1460.75	1.442E+01	(P	4.551E-01 6.08E-01	G
MN-54		-1.3446E-02					
			834.81	-1.345E-02	&(P	5.334E-02 1.55E-02	G
CO-57		1.3433E-03					
			122.07	1.343E-03	%(	5.191E-02 1.54E-02	G K
			136.43	7.425E-02	%	4.059E-01 1.21E-01	G
CO-60		1.2549E-02					
			1332.51	1.255E-02	%(P	5.724E-02 1.64E-02	G K
			1173.23	1.670E-02	% P	6.895E-02 2.01E-02	G K
Sr-85		-5.3662E-04					
			514.00	-5.366E-04	%(	4.794E-02 1.37E-02	G
Kr-85		-3.8241E+01					
			513.99	-3.824E+01	%(P	1.107E+03 3.15E+02	G
Y-88		0.0000E+00					
			1836.01	0.000E+00	%(	2.326E-02 3.16E-03	G K
			898.02	3.169E-03	% P	4.691E-02 1.30E-02	G
NB-94		-5.8580E-03					
			871.10	-5.858E-03	%(P	5.109E-02 1.45E-02	G K
			702.50	-8.957E-03	% P	5.012E-02 1.45E-02	G K
Ag-108M		1.4356E-02					
			722.95	1.436E-02	&(	4.777E-02 1.40E-02	G K
			614.37	-1.292E-02	% P	5.372E-02 1.58E-02	G
			433.93	5.144E-03	&	4.140E-02 1.20E-02	G
CD-109		1.1164E+00					
			88.04	1.116E+00	(P	1.313E+00 4.04E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SN-113	1.3354E-02						
		391.71	1.335E-02	&(	6.267E-02	1.85E-02	G K
		255.04	1.879E-01	& P	1.603E+00	4.71E-01	G
SB-125	3.3353E-02						
		427.95	3.335E-02	%(P	9.345E-02	2.77E-02	G K
		600.77	5.333E-02	% P	1.836E-01	5.37E-02	G
		636.15	-3.081E-03	& P	4.700E-01	1.33E-01	G
		463.51	2.784E-01	% P	4.083E-01	1.26E-01	G
		176.29	-9.431E-03	& P	5.610E-01	1.65E-01	G
I-131	7.5566E-03						
		364.48	7.557E-03	%(	4.548E-02	1.33E-02	G K
		636.97	1.098E-01	%	6.693E-01	1.94E-01	G
		284.29	-7.619E-03	&	6.329E-01	1.84E-01	G
CS-134	2.3310E-02						
		604.66	-7.334E-04	%(P	7.444E-02	2.16E-02	G K
		795.76	5.079E-02	(P	5.220E-02	1.72E-02	G
		569.29	-4.481E-03	% P	2.162E-01	5.95E-02	G
		801.84	1.138E-01	%	4.903E-01	1.42E-01	G
CS-137	-1.2223E-02						
		661.62	-1.222E-02	%(P	6.248E-02	1.81E-02	G
CE-139	-3.2591E-03						
		165.85	-3.259E-03	%(P	5.105E-02	1.51E-02	G
EU-152	-1.9455E-02						
		121.78	-1.945E-02	%(P	1.443E-01	4.30E-02	G K
		344.30	-2.031E-02	% P	1.479E-01	4.33E-02	G
		1408.08	-4.350E-02	% P	2.756E-01	7.70E-02	G
		964.00	-1.205E-01	% P	4.577E-01	1.34E-01	G
		1112.07	1.627E-02	& P	5.904E-01	1.68E-01	G
		778.90	7.115E-02	% P	3.284E-01	9.47E-02	G
EU-154	-4.5171E-03						
		123.10	-4.517E-03	&(P	1.062E-01	3.15E-02	G K
		1274.80	3.301E-03	& P	1.738E-01	4.77E-02	G
		723.30	9.465E-02	% P	1.499E-01	4.71E-02	G
		1004.80	-7.489E-02	& P	3.689E-01	1.07E-01	G
EU-155	1.2395E-01						
		86.45	1.240E-01	(	1.678E-01	5.14E-02	G K
		105.31	-3.510E-03	%	2.079E-01	6.18E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
HG-203	1.4733E-02						
		279.17	1.473E-02	&(	4.350E-02	1.30E-02	G K
		72.87	-5.198E-01	& P	1.211E+00	3.66E-01	G
		70.83	-1.176E+00	%	2.065E+00	6.28E-01	G
		82.50	-7.285E-01	%	2.623E+00	7.90E-01	G
TL-208	2.6644E-01						
		583.14	2.664E-01	(P	5.240E-02	2.57E-02	G
		510.72	4.778E-01	+ P	2.062E-01	8.36E-02	G
PB-212	6.3616E-01						
		238.63	6.233E-01	(P	1.020E-01	3.99E-02	G K
							Energy duplication
		77.11	6.678E-01	@(	3.597E-01	1.15E-01	G
		74.81	8.890E-01	& P	7.107E-01	2.21E-01	G
PB-214	4.0176E-01						
		351.99	4.112E-01	(P	1.003E-01	3.99E-02	G K
		295.22	3.835E-01	(P	2.064E-01	6.90E-02	G
							Energy duplication
		77.11	1.077E+00	+ P	5.895E-01	1.87E-01	G
		241.92	2.237E-01	% P	6.702E-01	2.02E-01	G
BI-212	6.9385E-01						
		727.17	6.938E-01	@(P	3.586E-01	1.46E-01	G K
		1620.56	-3.277E-01	%	1.961E+00	5.43E-01	G
		785.42	3.398E-01	% P	2.316E+00	6.60E-01	G
BI-214	4.9756E-01						
		609.32	4.865E-01	(P	1.080E-01	5.35E-02	G K
		1764.51	5.295E-01	?(P	1.881E-01	1.08E-01	G
		1120.28	6.658E-01	+ P	3.740E-01	1.52E-01	G
RA-224	9.8984E-01						
		241.00	9.898E-01	(P	1.242E+00	3.83E-01	G
RA-226	1.0614E+00						
		185.99	1.061E+00	*(	1.199E+00	3.72E-01	G
AC-228	7.6737E-01						
		911.07	7.450E-01	(P	2.057E-01	1.02E-01	G K
		968.90	8.789E-01	(P	2.934E-01	1.39E-01	G
		338.40	6.592E-01	(P	2.862E-01	1.08E-01	G
TH-227	-3.8655E-03						
		236.00	-3.866E-03	%(P	3.186E-01	9.32E-02	G K
		256.25	6.725E-02	% P	5.574E-01	1.64E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
PA-234	4.1272E-02						
		98.44	4.127E-02	&(	1.843E-01	5.53E-02	G K
		946.00	2.453E-02	&	2.677E-01	7.55E-02	G
		131.28	-2.100E-02	%	2.214E-01	6.60E-02	G
		94.67	-1.100E-01	%	3.430E-01	1.03E-01	G
		883.24	-7.044E-02	%	4.475E-01	1.28E-01	G
		926.70	5.701E-02	%	4.542E-01	1.29E-01	G
		569.26	2.204E-03	%	3.933E-01	1.11E-01	G
TH-234	1.0885E+00						
		63.29	7.516E-01	%(P	2.262E+00	6.80E-01	G K
		92.80	1.526E+00	(P	1.690E+00	5.20E-01	G
		92.38	-8.108E-02	% P	2.063E+00	6.11E-01	G
AM-241	1.4308E-02						
		59.54	1.431E-02	&(P	2.937E-01	8.73E-02	G

(- This peak used in the nuclide activity average.

* - Peak is too wide, but only one peak in library.
! - Peak is part of a multiplet and this area went negative during deconvolution.
? - Peak is too narrow.
@ - Peak is too wide at FW25M, but ok at FWHM.
% - Peak fails sensitivity test.
$ - Peak identified, but first peak of this nuclide failed one or more qualification tests.
\+ - Peak activity higher than counting uncertainty range.
\- - Peak activity lower than counting uncertainty range.
= - Peak outside analysis energy range.
& - Calculated peak centroid is not close enough to the library energy centroid for positive identification.
P - Peakbackground subtraction
} - Peak is too close to another for the activity to be found directly.

Nuclide Codes:	Peak Codes:
T - Thermal Neutron Activation	G - Gamma Ray
F - Fast Neutron Activation	X - X-Ray
I - Fission Product	P - Positron Decay
N - Naturally Occurring Isotope	S - Single-Escape
P - Photon Reaction	D - Double-Escape
C - Charged Particle Reaction	K - Key Line
M - No MDA Calculation	A - Not in Average
R - Coincidence Corrected	C - Coincidence Peak
H - Halflife limit exceeded	

- -

***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	5.9556E-02	5.9960E-02	3.3943E-01	3.3945E-01	3.867E-01
K-40		1.4422E+01	1.4422E+01	1.8223E+00	1.9962E+00	
MN-54	#A	-1.3431E-02	-1.3446E-02	5.1216E-02	5.1221E-02	5.328E-02
CO-57	#B	1.3416E-03	1.3433E-03	4.6294E-02	4.6294E-02	5.184E-02
CO-60	#B	1.2546E-02	1.2549E-02	4.9062E-02	4.9067E-02	5.723E-02
Sr-85	#A	-5.3364E-04	-5.3662E-04	4.1229E-02	4.1229E-02	4.767E-02
Kr-85	#A	-3.8241E+01	-3.8241E+01	5.5527E+03	5.5527E+03	1.107E+03
Y-88	#B	0.0000E+00	0.0000E+00	9.4686E-03	9.4703E-03	2.318E-02
NB-94	#B	-5.8580E-03	-5.8580E-03	4.6724E-02	4.6725E-02	5.109E-02
Ag-108M	#B	1.4355E-02	1.4356E-02	4.2147E-02	4.2155E-02	4.777E-02
CD-109	#A	1.1155E+00	1.1164E+00	1.2132E+00	1.2148E+00	1.312E+00
SN-113	#B	1.3312E-02	1.3354E-02	5.5426E-02	5.5431E-02	6.247E-02
SB-125	#B	3.3341E-02	3.3353E-02	8.3233E-02	8.3255E-02	9.341E-02
I-131	#B	7.2250E-03	7.5566E-03	3.9943E-02	3.9945E-02	4.349E-02
CS-134	#B	2.3299E-02	2.3310E-02	2.3645E-02	2.3682E-02	7.440E-02
CS-137	#A	-1.2222E-02	-1.2223E-02	6.7331E-02	6.7335E-02	6.248E-02
CE-139	#A	-3.2505E-03	-3.2591E-03	4.9987E-02	4.9988E-02	5.091E-02
EU-152	#B	-1.9453E-02	-1.9455E-02	1.4233E-01	1.4233E-01	1.443E-01
EU-154	#B	-4.5166E-03	-4.5171E-03	1.3515E-01	1.3515E-01	1.062E-01
EU-155	#A	1.2393E-01	1.2395E-01	1.5422E-01	1.5438E-01	1.678E-01
HG-203	#B	1.4620E-02	1.4733E-02	3.9096E-02	3.9104E-02	4.316E-02
TL-208		2.6644E-01	2.6644E-01	7.6944E-02	7.8403E-02	
PB-212	#	6.3616E-01	6.3616E-01	1.2208E-01	1.2726E-01	1.020E-01
PB-214	#	4.0176E-01	4.0176E-01	1.1682E-01	1.1900E-01	1.003E-01
BI-212	#	6.9385E-01	6.9385E-01	4.3701E-01	4.3877E-01	
BI-214		4.9756E-01	4.9756E-01	1.6408E-01	1.6647E-01	
RA-224	#A	9.8984E-01	9.8984E-01	1.1491E+00	1.1505E+00	1.242E+00
RA-226	#A	1.0614E+00	1.0614E+00	1.1150E+00	1.1166E+00	1.199E+00
AC-228		7.6737E-01	7.6737E-01	2.0377E-01	2.0834E-01	
TH-227	#B	-3.8655E-03	-3.8655E-03	7.9370E-01	7.9370E-01	3.186E-01
PA-234	#B	4.1272E-02	4.1272E-02	1.6585E-01	1.6587E-01	1.843E-01
TH-234	#B	1.0885E+00	1.0885E+00	1.1129E+00	1.1145E+00	2.262E+00
AM-241	#A	1.4308E-02	1.4308E-02	2.6194E-01	2.6194E-01	2.937E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (270.1 to 1999.1 keV) 1.6647558E+01 pCi/gm
Total Decayed Activity (270.1 to 1999.1 keV) 1.6647558E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JPK

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 101F_26JUL2006_1936.An1

Sample description
FSS-OOL-05-06-012-F

Spectrum Filename: C:\GammaVision\Spectra\101F_26JUL2006_1936.An1

Acquisition information
Start time: 26-Jul-2006 19:36:25
Live time: 2000
Real time: 2001
Dead time: 0.07 %
Detector ID: 1

Detector system
Det 101- DSPE-633

Calibration
Filename: D1_1LSa.Clb
Detector 101 1.0 Liter Marinelli Sand

Energy Calibration
Created: 03-Sep-2004 08:50:48
Zero offset: 0.244 keV
Gain: 0.500 keV/channel
Quadratic: -2.493E-08 keV/channel^2

Efficiency Calibration
Created: 03-Sep-2004 08:52:26
Type: Polynomial
Uncertainty: 0.626 %
Coefficients: -0.321775 -5.816463 0.734234
-0.099357 0.006049 -0.000149

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.23keV)
Stop channel: 4000 (1999.11keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 1.6690E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.6690E+03) =
5.9916E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	24-Jul-2006 21:47:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	101_150K_28APR05.Pbc 01-May-2005 05:24:47
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 11 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.4863

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
74.46	127.	23.48	1.00	1.651E-02	72.87	6.400	PBC<MDA	HG203
					74.81	9.600	PBC<MDA	PB212
77.29	274.	10.46	1.01	1.732E-02	77.11	10.700	1.190E+00	PB214
					77.11	17.500	7.374E-01	PB212
87.90	62.	41.21	1.01	1.933E-02	88.04	3.790	PBC<MDA	CD109
89.99	73.	35.41	1.02	1.960E-02				
93.02	120.	20.75	1.02	1.994E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
186.80	96.	29.94	0.97	1.854E-02	185.99	3.280	1.270E+00	RA226
238.96	562.	4.88	1.12	1.556E-02	238.63	43.100	6.700E-01	PB212
242.17	103.	19.15	1.12	1.539E-02	241.00	3.900	1.368E+00	RA224
					241.92	7.470	PBC<MDA	PB214
269.96	76.	29.54	0.72	1.402E-02				
277.88	52.	38.18	0.65	1.366E-02				
295.35	153.	13.95	1.32	1.292E-02	295.22	19.200	4.942E-01	PB214
338.80	139.	20.54	1.62	1.134E-02	338.40	12.010	8.115E-01	AC228
352.51	246.	9.76	1.30	1.091E-02	351.99	37.100	4.875E-01	PB214
463.58	41.	36.68	1.63	8.340E-03	463.51	10.000	3.873E-01	SB125
511.43	99.	16.11	1.84	7.580E-03	510.72	22.500	3.943E-01	TL208
583.72	198.	10.82	1.15	6.678E-03	583.14	86.000	2.758E-01	TL208
609.72	180.	12.83	1.51	6.409E-03	609.32	46.090	4.890E-01	BI214
911.83	130.	12.08	1.57	4.443E-03	911.07	29.000	8.058E-01	AC228
969.42	108.	19.10	1.07	4.210E-03	968.90	17.460	1.177E+00	AC228
1121.13	50.	30.00	1.52	3.711E-03	1120.28	15.040	7.198E-01	BI214
1462.10	536.	4.42	1.73	2.940E-03	1460.75	10.700	1.372E+01	K40

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
148.49	74.72	380.	127.	0.063	70.45	1.005	BI-207	D
154.15	77.54	274.	274.	0.137	31.37	1.007	PB-214	D
175.38	88.12	290.	62.	0.031	123.63	1.014	PB-214	lD
179.62	90.21	302.	66.	0.033	117.02	1.016	PB-214	D
185.68	93.24	250.	118.	0.059	63.17	1.018	U-235	D
477.61	238.93	94.	562.	0.281	14.63	1.122	PB-212	D
484.05	242.15	141.	103.	0.051	57.44	1.124	PB-214	D
539.65	269.96	158.	76.	0.038	88.63	0.723	AC-228	s

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-212	149.57	75.00	853.	118.	0.059	103.96	1.499
PB-214	153.79	77.11	704.	259.	0.130	46.49	1.499D
PB-212	153.79	77.11	700.	263.	0.132	46.49	1.499D
TH-234	185.81	93.11	711.	106.	0.053	99.96	1.499
TH-234	185.73	93.07	686.	111.	0.056	98.10	1.499
RA-226	372.34	186.34	311.	93.	0.047	85.88	1.499s
PB-212	477.57	238.93	362.	452.	0.226	22.39	1.499
RA-224	483.61	241.95	390.	85.	0.043	102.49	1.499
PB-214	590.93	295.59	139.	135.	0.068	44.39	1.499
AC-228	677.39	338.80	189.	137.	0.068	61.62	1.624s
PB-214	704.57	352.39	86.	216.	0.108	27.03	1.499
SB-125	926.85	463.48	63.	35.	0.017	104.44	1.499s
TL-208	1022.80	511.43	74.	83.	0.042	48.32	1.841s
TL-208	1167.45	583.72	75.	196.	0.098	32.47	1.149
BI-214	1219.45	609.71	68.	168.	0.084	33.69	1.505s
AC-228	1824.01	911.83	40.	128.	0.064	36.24	1.575s
AC-228	1939.26	969.42	69.	107.	0.053	57.29	1.074s
BI-214	2242.84	1121.13	50.	50.	0.025	90.00	1.515
K-40	2925.22	1462.10	8.	534.	0.267	13.26	1.728

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	Peak MDA Value pCi/gm	COMMENTS
BE-7		5.6086E-02					
			477.56	5.609E-02	%(	3.722E-01 1.07E-01	G
K-40		1.3720E+01					
			1460.75	1.372E+01	(P	4.187E-01 6.10E-01	G
MN-54		-1.4931E-03					
			834.81	-1.493E-03	&(P	4.746E-02 1.30E-02	G
CO-57		1.1686E-04					
			122.07	1.169E-04	&(	4.901E-02 1.45E-02	G K
			136.43	-1.157E-01	%	4.100E-01 1.23E-01	G
CO-60		1.0378E-02					
			1332.51	1.038E-02	&(P	6.268E-02 1.77E-02	G K
			1173.23	4.779E-03	& P	6.343E-02 1.77E-02	G K
Sr-85		-2.0231E-02					
			514.00	-2.023E-02	%(	5.985E-02 1.79E-02	G
Kr-85		-4.8688E+02					
			513.99	-4.869E+02	%(P	1.360E+03 4.05E+02	G
Y-88		-4.2083E-03					
			1836.01	-4.208E-03	%(	4.398E-02 1.12E-02	G K
			898.02	7.960E-03	& P	4.429E-02 1.25E-02	G
NB-94		-1.4235E-04					
			871.10	-1.424E-04	%(P	4.456E-02 1.21E-02	G K
			702.50	-6.629E-04	& P	5.021E-02 1.41E-02	G K
Ag-108M		1.7405E-03					
			722.95	1.740E-03	%(	6.432E-02 1.83E-02	G K
			614.37	-3.098E-02	& P	6.453E-02 1.96E-02	G
			433.93	2.807E-03	%	3.897E-02 1.11E-02	G
CD-109		8.2683E-01					
			88.04	8.268E-01	%(P	1.356E+00 4.13E-01	G
SN-113		1.9952E-02					
			391.71	1.995E-02	%(	5.258E-02 1.57E-02	G K
			255.04	-3.018E-01	% P	1.858E+00 5.49E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	1.2139E-01						
		427.95	4.781E-02	%(P	1.328E-01	3.96E-02	G K
		600.77	5.583E-02	% P	2.531E-01	7.38E-02	G
		636.15	-7.224E-02	% P	3.572E-01	1.02E-01	G
		463.51	3.392E-01	(P	3.868E-01	1.23E-01	G
		176.29	-1.462E-01	& P	6.532E-01	1.94E-01	G
I-131	1.9743E-02						
		364.48	1.974E-02	%(	5.343E-02	1.60E-02	G K
		636.97	-1.082E-01	%	5.864E-01	1.67E-01	G
		284.29	-1.052E-01	%	7.697E-01	2.27E-01	G
CS-134	-7.9553E-04						
		604.66	-7.955E-04	%(P	7.898E-02	2.29E-02	G K
		795.76	3.127E-02	% P	5.252E-02	1.63E-02	G
		569.29	4.404E-03	& P	2.674E-01	7.49E-02	G
		801.84	-1.829E-02	&	4.216E-01	1.14E-01	G
CS-137	-6.8201E-03						
		661.62	-6.820E-03	%(P	4.300E-02	1.19E-02	G
CE-139	6.4833E-04						
		165.85	6.483E-04	&(P	4.897E-02	1.44E-02	G
EU-152	3.5842E-02						
		121.78	3.584E-02	&(P	1.307E-01	3.92E-02	G K
		344.30	8.003E-04	% P	1.658E-01	4.81E-02	G
		1408.08	2.836E-02	% P	1.918E-01	5.12E-02	G
		964.00	-2.571E-02	% P	5.304E-01	1.50E-01	G
		1112.07	-5.972E-02	% P	4.851E-01	1.37E-01	G
		778.90	-4.131E-02	& P	3.417E-01	9.61E-02	G
EU-154	-2.5060E-02						
		123.10	-2.506E-02	%(P	1.073E-01	3.21E-02	G K
		1274.80	-3.971E-02	% P	2.053E-01	5.90E-02	G
		723.30	4.663E-02	% P	1.570E-01	4.53E-02	G
		1004.80	5.488E-02	& P	3.308E-01	9.44E-02	G
EU-155	4.1976E-03						
		86.45	4.198E-03	&(	1.506E-01	4.47E-02	G K
		105.31	7.820E-02	%	1.960E-01	5.92E-02	G
HG-203	7.9998E-04						
		279.17	8.000E-04	&(	4.531E-02	1.32E-02	G K
		72.87	-8.563E-01	% P	1.303E+00	3.97E-01	G
		70.83	-5.099E-01	&	2.168E+00	6.51E-01	G
		82.50	-6.105E-01	%	2.319E+00	6.96E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	2.7581E-01						
		583.14	2.758E-01	(P	6.072E-02	3.02E-02	G
		510.72	3.943E-01	+ P	2.027E-01	7.58E-02	G
PB-212	5.5536E-01						
		238.63	5.453E-01	(P	1.102E-01	4.12E-02	G K
							Energy duplication
		77.11	7.079E-01	+	3.389E-01	1.10E-01	G
		74.81	6.007E-01	&(P	7.077E-01	2.17E-01	G
PB-214	4.3461E-01						
		351.99	4.311E-01	(P	9.154E-02	3.92E-02	G K
		295.22	4.413E-01	(P	1.880E-01	6.62E-02	G
							Energy duplication
		77.11	1.141E+00	+ P	5.558E-01	1.79E-01	G
		241.92	-7.579E-02	% P	8.509E-01	2.53E-01	G
BI-212	2.2427E-01						
		727.17	2.243E-01	%(P	4.404E-01	1.34E-01	G K
		1620.56	0.000E+00	%	1.745E+00	4.39E-01	G
		785.42	5.295E-01	% P	2.043E+00	5.90E-01	G
BI-214	4.6130E-01						
		609.32	4.613E-01	@(P	1.124E-01	5.22E-02	G K
		1764.51	-8.973E-03	% P	3.492E-01	8.70E-02	G
		1120.28	7.198E-01	+ P	5.192E-01	2.18E-01	G
RA-224	1.1471E+00						
		241.00	1.147E+00	(P	1.273E+00	3.95E-01	G
RA-226	1.2407E+00						
		185.99	1.241E+00	(	1.127E+00	3.55E-01	G
AC-228	8.0747E-01						
		911.07	8.058E-01	@(P	2.013E-01	9.88E-02	G K
		968.90	1.177E+00	+ P	4.564E-01	2.26E-01	G
		338.40	8.115E-01	*(P	3.970E-01	1.69E-01	G
TH-227	-1.4005E-01						
		236.00	-1.401E-01	%(P	4.307E-01	1.29E-01	G K
		256.25	5.898E-02	% P	5.395E-01	1.58E-01	G
PA-234	2.5674E-03						
		98.44	2.567E-03	%(	1.783E-01	5.29E-02	G K
		946.00	2.453E-02	%	2.414E-01	6.73E-02	G
		131.28	3.105E-02	%	2.071E-01	6.18E-02	G
		94.67	-9.346E-02	%	3.409E-01	1.03E-01	G
		883.24	1.332E-01	&	2.950E-01	8.92E-02	G
		926.70	-7.862E-02	%	4.719E-01	1.34E-01	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26-8.188E-04 &   4.123E-01 1.16E-01 G

TH-234       1.2474E+00
                           63.29 7.574E-01 &(P 2.170E+00 6.52E-01 G K
                           92.80 1.511E+00  (P 1.693E+00 5.21E-01 G
                           92.38 1.683E+00  (P 2.015E+00 6.18E-01 G

AM-241      -1.2284E-01
                           59.54-1.228E-01 %(P 2.996E-01 9.05E-02 G
   ( - This peak used in the nuclide activity average.

   * - Peak is too wide, but only one peak in library.
   ! - Peak is part of a multiplet and this area went
       negative during deconvolution.
   ? - Peak is too narrow.
   @ - Peak is too wide at FW25M, but ok at FWHM.
   % - Peak fails sensitivity test.
   $ - Peak identified, but first peak of this nuclide
       failed one or more qualification tests.
   + - Peak activity higher than counting uncertainty range.
   - - Peak activity lower than counting uncertainty range.
   = - Peak outside analysis energy range.
   & - Calculated peak centroid is not close enough to the
       library energy centroid for positive identification.
   P - Peakbackground subtraction
   } - Peak is too close to another for the activity
       to be found directly.

   Nuclide Codes:                      Peak Codes:
   T - Thermal Neutron Activation      G - Gamma Ray
   F - Fast Neutron Activation         X - X-Ray
   I - Fission Product                 P - Positron Decay
   N - Naturally Occurring Isotope     S - Single-Escape
   P - Photon Reaction                 D - Double-Escape
   C - Charged Particle Reaction       K - Key Line
   M - No MDA Calculation              A - Not in Average
   R - Coincidence Corrected           C - Coincidence Peak
   H - Halflife limit exceeded

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
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***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	5.4713E-02	5.6086E-02	3.2218E-01	3.2219E-01	3.631E-01
K-40		1.3720E+01	1.3720E+01	1.8277E+00	1.9853E+00	
MN-54	#A	-1.4868E-03	-1.4931E-03	1.0891E-01	1.0891E-01	4.725E-02
CO-57	#B	1.1629E-04	1.1686E-04	4.3519E-02	4.3519E-02	4.877E-02
CO-60	#B	1.0371E-02	1.0378E-02	5.3037E-02	5.3040E-02	6.264E-02

Sr-85	#A	-1.9822E-02	-2.0231E-02	5.3675E-02	5.3687E-02	5.864E-02
Kr-85	#A	-4.8687E+02	-4.8688E+02	1.3699E+03	1.3702E+03	1.360E+03
Y-88	#B	-4.1564E-03	-4.2083E-03	3.3536E-02	3.3537E-02	4.344E-02
NB-94	#B	-1.4235E-04	-1.4235E-04	1.4933E-01	1.4933E-01	4.456E-02
Ag-108M	#B	1.7404E-03	1.7405E-03	5.4758E-02	5.4759E-02	6.432E-02
CD-109	#A	8.2442E-01	8.2683E-01	1.2405E+00	1.2413E+00	1.352E+00
SN-113	#B	1.9724E-02	1.9952E-02	4.7209E-02	4.7222E-02	5.198E-02
SB-125	#B	1.2124E-01	1.2139E-01	1.3204E-01	1.3222E-01	1.326E-01
I-131	#B	1.6746E-02	1.9743E-02	4.8004E-02	4.8017E-02	4.532E-02
CS-134	#B	-7.9413E-04	-7.9553E-04	8.4831E-02	8.4831E-02	7.884E-02
CS-137	#A	-6.8192E-03	-6.8201E-03	5.4550E-02	5.4551E-02	4.300E-02
CE-139	#A	6.4212E-04	6.4833E-04	4.3334E-02	4.3334E-02	4.850E-02
EU-152	#B	3.5832E-02	3.5842E-02	1.1754E-01	1.1756E-01	1.307E-01
EU-154	#B	-2.5050E-02	-2.5060E-02	1.0324E-01	1.0325E-01	1.073E-01
EU-155	#B	4.1945E-03	4.1976E-03	1.3414E-01	1.3414E-01	1.505E-01
HG-203	#B	7.7757E-04	7.9998E-04	3.9469E-02	3.9469E-02	4.404E-02
TL-208		2.7581E-01	2.7581E-01	9.0652E-02	9.1982E-02	
PB-212	#	5.5536E-01	5.5536E-01	1.2603E-01	1.2988E-01	1.102E-01
PB-214	#	4.3461E-01	4.3461E-01	1.1430E-01	1.1690E-01	9.154E-02
BI-212	#B	2.2427E-01	2.2427E-01	4.0157E-01	4.0177E-01	4.404E-01
BI-214		4.6130E-01	4.6130E-01	1.5644E-01	1.5860E-01	
RA-224	#A	1.1471E+00	1.1471E+00	1.1855E+00	1.1873E+00	1.273E+00
RA-226	#	1.2407E+00	1.2407E+00	1.0655E+00	1.0678E+00	1.127E+00
AC-228		8.0747E-01	8.0747E-01	2.9312E-01	2.9665E-01	
TH-227	#B	-1.4005E-01	-1.4005E-01	3.9929E-01	3.9936E-01	4.307E-01
PA-234	#B	2.5674E-03	2.5674E-03	1.5857E-01	1.5857E-01	1.783E-01
TH-234	#B	1.2474E+00	1.2474E+00	1.2445E+00	1.2464E+00	2.170E+00
AM-241	#A	-1.2284E-01	-1.2284E-01	2.8184E-01	2.8192E-01	2.996E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (269.6 to 1999.1 keV) 1.5265031E+01 pCi/gm
Total Decayed Activity (269.6 to 1999.1 keV) 1.5265031E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
DAT

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 101F_27JUL2006_1157.An1

Sample description
FSS-OOL-05-06-011-F

Spectrum Filename: C:\GammaVision\Spectra\101F_27JUL2006_1157.An1

Acquisition information
Start time: 27-Jul-2006 11:57:14
Live time: 2000
Real time: 2002
Dead time: 0.12 %
Detector ID: 1

Detector system
Det 101- DSPE-633

Calibration
Filename: D1_1LSa.Clb
Detector 101 1.0 Liter Marinelli Sand

Energy Calibration
Created: 03-Sep-2004 08:50:48
Zero offset: 0.244 keV
Gain: 0.500 keV/channel
Quadratic: -2.493E-08 keV/channel^2

Efficiency Calibration
Created: 03-Sep-2004 08:52:26
Type: Polynomial
Uncertainty: 0.626 %
Coefficients: -0.321775 -5.816463 0.734234
-0.099357 0.006049 -0.000149

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.23keV)
Stop channel: 4000 (1999.11keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 1.9700E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.9700E+03) =
5.0761E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	24-Jul-2006 21:23:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	101_150K_28APR05.Pbc 01-May-2005 05:24:47
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 14 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.3411

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
74.38	137.	24.73	1.00	1.651E-02	74.81	9.600	5.680E-01	PB212
77.60	285.	11.38	1.01	1.742E-02	77.11	10.700	1.047E+00	PB214
					77.11	17.500	6.488E-01	PB212
84.10	67.	41.42	1.01	1.876E-02				
87.79	83.	33.97	1.01	1.933E-02				
89.75	104.	26.38	1.02	1.958E-02				
92.97	161.	17.80	1.02	1.994E-02	92.38	2.570	2.025E+00	TH234
					92.80	3.000	1.785E+00	TH234
129.40	66.	40.06	1.22	2.109E-02				
186.17	75.	31.88	0.81	1.857E-02	185.99	3.280	8.475E-01	RA226
209.16	100.	26.64	1.27	1.722E-02				
238.95	746.	4.29	1.12	1.556E-02	238.63	43.100	7.562E-01	PB212
241.95	100.	21.39	1.12	1.540E-02	241.00	3.900	PBC<MDA	RA224
					241.92	7.470	5.914E-01	PB214
270.01	118.	23.52	1.25	1.401E-02				
295.56	175.	10.76	1.16	1.291E-02	295.22	19.200	4.791E-01	PB214
300.44	69.	23.60	1.16	1.271E-02				
338.66	149.	13.09	1.44	1.134E-02	338.40	12.010	7.368E-01	AC228
352.22	236.	9.40	1.10	1.092E-02	351.99	37.100	3.954E-01	PB214
409.94	37.	32.32	1.22	9.410E-03				
463.21	53.	35.15	0.81	8.347E-03				
463.21	53.	35.15	0.81	8.347E-03	463.51	10.000	4.247E-01	SB125
511.15	112.	17.56	1.61	7.584E-03	510.72	22.500	3.847E-01	TL208
583.61	242.	9.46	1.36	6.679E-03	583.14	86.000	2.859E-01	TL208
609.80	196.	9.27	1.29	6.408E-03	609.32	46.090	4.523E-01	BI214
727.73	106.	18.15	1.92	5.439E-03	727.17	11.800	1.125E+00	BI212
795.45	23.	40.37	1.50	5.016E-03	795.76	85.400	PBC<MDA	CS134

911.50	161.	11.87	1.53	4.445E-03	911.07	29.000	8.465E-01	AC228
968.81	115.	13.99	1.29	4.212E-03	968.90	17.460	1.064E+00	AC228
1120.52	36.	30.78	1.40	3.711E-03	1120.28	15.040	4.476E-01	BI214
1461.65	677.	3.96	2.03	2.941E-03	1460.75	10.700	1.470E+01	K40
1765.71	32.	19.41	1.94	2.481E-03	1764.51	15.920	5.602E-01	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
167.77	84.38	357.	67.	0.034	124.27	1.011	TA-182	lD
175.15	88.07	358.	83.	0.042	101.90	1.014	PB-214	lD
179.09	90.04	322.	104.	0.052	79.14	1.016	PB-214	lD
258.42	129.40	332.	66.	0.033	123.26	1.224	AC-228	
417.99	209.16	280.	100.	0.050	79.93	1.268	AC-228	s
539.74	270.01	232.	118.	0.059	70.57	1.254	AC-228	
600.65	300.45	122.	67.	0.034	78.96	0.958	PB-212	s
819.72	409.94	53.	37.	0.019	96.96	1.224	AC-228	
926.32	463.21	98.	53.	0.026	105.44	0.813	AC-228	l
1455.61	727.73	115.	57.	0.028	89.80	1.924	J-132	s

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-212	149.19	74.81	371.	223.	0.112	40.68	1.005D
PB-212	153.79	77.11	425.	336.	0.168	28.65	1.007A
TH-234	185.66	93.04	903.	162.	0.081	76.91	1.499s
TH-234	185.59	93.01	884.	166.	0.083	76.65	1.499s
RA-226	371.90	186.12	513.	84.	0.042	118.73	1.499
PB-212	476.96	238.63	185.	736.	0.368	13.40	1.122D
PB-214	483.54	241.92	188.	90.	0.045	70.95	1.124D
PB-214	590.89	295.57	204.	146.	0.073	52.00	0.751
AC-228	677.10	338.66	107.	146.	0.073	39.27	1.436s
PB-214	704.23	352.22	108.	234.	0.117	28.21	1.095
TL-208	1022.24	511.15	104.	96.	0.048	52.67	1.607s
TL-208	1167.23	583.61	90.	240.	0.120	28.37	1.362
BI-214	1219.64	609.80	57.	195.	0.097	27.82	1.285s
BI-212	1455.91	727.88	63.	49.	0.024	80.21	1.499s
CS-134	1591.12	795.45	32.	23.	0.011	121.10	1.502s
AC-228	1823.35	911.50	53.	159.	0.080	35.60	1.534s
AC-228	1938.04	968.81	47.	114.	0.057	41.98	1.288
BI-214	2241.64	1120.52	36.	36.	0.018	92.35	1.398
K-40	2924.33	1461.65	12.	675.	0.337	11.89	2.031
BI-214	3532.85	1765.71	3.	32.	0.016	58.23	1.937

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	Peak MDA Value pCi/gm	COMMENTS
BE-7		-4.9266E-02					
			477.56	-4.927E-02	%(	4.085E-01 1.19E-01	G
K-40		1.4703E+01					
			1460.75	1.470E+01	(P	4.134E-01 5.85E-01	G
MN-54		2.2853E-02					
			834.81	2.285E-02	%(P	5.005E-02 1.51E-02	G
CO-57		1.1363E-02					
			122.07	1.136E-02	&(	4.638E-02 1.39E-02	G K
			136.43	1.770E-01	&	3.400E-01 1.03E-01	G
CO-60		-5.6884E-03					
			1332.51	-5.688E-03	%(P	5.822E-02 1.62E-02	G K
			1173.23	-1.292E-02	% P	7.123E-02 2.06E-02	G K
Sr-85		-9.7247E-03					
			514.00	-9.725E-03	%(	5.105E-02 1.50E-02	G
Kr-85		-2.4353E+02					
			513.99	-2.435E+02	%(P	1.151E+03 3.37E+02	G
Y-88		4.2226E-03					
			1836.01	4.223E-03	%(	3.621E-02 9.27E-03	G K
			898.02	9.751E-03	% P	5.822E-02 1.68E-02	G
NB-94		-1.9769E-04					
			871.10	-1.977E-04	%(P	5.408E-02 1.52E-02	G K
			702.50	-1.354E-03	% P	4.740E-02 1.34E-02	G K
Ag-108M		8.9331E-03					
			722.95	8.933E-03	%(	5.332E-02 1.54E-02	G K
			614.37	-2.644E-02	% P	6.372E-02 1.92E-02	G
			433.93	1.340E-02	%	4.369E-02 1.30E-02	G
CD-109		3.3774E-02					
			88.04	3.377E-02	%(P	1.493E+00 4.46E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SN-113	-4.0855E-03						
		391.71	-4.086E-03	&(	6.483E-02	1.89E-02	G K
		255.04	3.164E-01	% P	1.832E+00	5.44E-01	G
SB-125	4.8727E-02						
		427.95	4.873E-02	%(P	1.214E-01	3.65E-02	G K
		600.77	-7.423E-03	% P	2.505E-01	7.14E-02	G
		636.15	-2.831E-03	% P	4.705E-01	1.34E-01	G
		463.51	2.361E-01	% P	4.027E-01	1.23E-01	G
		176.29	-3.414E-02	% P	6.062E-01	1.79E-01	G
I-131	-2.5776E-03						
		364.48	-2.578E-03	&(	5.660E-02	1.64E-02	G K
		636.97	-7.519E-04	%	7.246E-01	2.04E-01	G
		284.29	2.059E-01	%	6.912E-01	2.06E-01	G
CS-134	1.8067E-02						
		604.66	1.973E-03	%(P	4.524E-02	1.29E-02	G K
		795.76	3.646E-02	*(P	4.696E-02	1.50E-02	G
		569.29	-8.411E-03	& P	2.864E-01	8.15E-02	G
		801.84	0.000E+00	%	5.288E-01	1.47E-01	G
CS-137	5.7399E-03						
		661.62	5.740E-03	%(P	5.213E-02	1.49E-02	G
CE-139	-1.0825E-03						
		165.85	-1.082E-03	%(P	5.006E-02	1.48E-02	G
EU-152	-1.4969E-02						
		121.78	-1.497E-02	%(P	1.338E-01	3.99E-02	G K
		344.30	4.884E-03	& P	1.141E-01	3.29E-02	G
		1408.08	6.079E-02	% P	2.098E-01	6.04E-02	G
		964.00	-9.019E-02	% P	4.460E-01	1.29E-01	G
		1112.07	1.539E-01	% P	3.830E-01	1.14E-01	G
		778.90	5.516E-03	% P	3.472E-01	9.71E-02	G
EU-154	2.5525E-02						
		123.10	2.552E-02	&(P	1.033E-01	3.10E-02	G K
		1274.80	-2.119E-02	% P	1.861E-01	5.28E-02	G
		723.30	8.217E-03	% P	1.652E-01	4.53E-02	G
		1004.80	1.155E-01	% P	2.357E-01	7.18E-02	G
EU-155	-1.5710E-03						
		86.45	-1.571E-03	%(	1.691E-01	5.04E-02	G K
		105.31	7.569E-02	%	1.926E-01	5.82E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
HG-203	6.8482E-04						
		279.17	6.848E-04	%(	4.564E-02	1.33E-02	G K
		72.87	-1.322E-01	% P	8.956E-01	2.67E-01	G
		70.83	2.235E-01	&	1.945E+00	5.82E-01	G
		82.50	-5.573E-01	&	2.518E+00	7.56E-01	G
TL-208	2.8594E-01						
		583.14	2.859E-01	(P	5.610E-02	2.73E-02	G
		510.72	3.847E-01	+ P	2.020E-01	7.89E-02	G
PB-212	7.6631E-01						
		238.63	7.523E-01	(P	6.747E-02	3.39E-02	G K
							Energy duplication
		77.11	7.663E-01	}	2.249E-01	7.32E-02	G
		74.81	9.647E-01	+ P	3.996E-01	1.34E-01	G
PB-214	3.9797E-01						
		351.99	3.954E-01	(P	8.669E-02	3.75E-02	G K
		295.22	4.030E-01	(P	1.917E-01	7.08E-02	G
							Energy duplication
		77.11	0.000E+00	} P	5.010E-01	0.00E+00	G
		241.92	5.395E-01	+ P	3.967E-01	1.29E-01	G
BI-212	5.2001E-01						
		727.17	5.200E-01	(P	4.243E-01	1.41E-01	G K
		1620.56	3.284E-01	%	1.613E+00	4.48E-01	G
		785.42	8.159E-01	& P	2.532E+00	7.50E-01	G
BI-214	4.7370E-01						
		609.32	4.523E-01	@(P	8.802E-02	4.22E-02	G K
		1764.51	5.602E-01	(P	1.810E-01	1.10E-01	G
		1120.28	4.476E-01	(P	3.750E-01	1.39E-01	G
RA-224	6.7234E-01						
		241.00	6.723E-01	&(P	1.265E+00	3.84E-01	G
RA-226	9.4751E-01						
		185.99	9.475E-01	(	1.218E+00	3.75E-01	G
AC-228	8.8896E-01						
		911.07	8.465E-01	*(P	1.947E-01	1.02E-01	G K
		968.90	1.064E+00	(P	3.230E-01	1.50E-01	G
		338.40	7.368E-01	(P	2.557E-01	9.79E-02	G
TH-227	-1.9013E-01						
		236.00	-1.901E-01	%(P	4.583E-01	1.39E-01	G K
		256.25	8.731E-02	% P	5.178E-01	1.53E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
PA-234	-4.3108E-02						
		98.44	-4.311E-02	%(	1.636E-01	4.91E-02	G K
		946.00	3.379E-02	&	2.663E-01	7.61E-02	G
		131.28	3.776E-04	%	2.155E-01	6.41E-02	G
		94.67	-9.382E-02	%	3.320E-01	1.00E-01	G
		883.24	1.204E-01	%	3.240E-01	9.62E-02	G
		926.70	8.107E-02	%	4.677E-01	1.35E-01	G
		569.26	3.053E-03	&	3.604E-01	1.02E-01	G
TH-234	1.5726E+00						
		63.29	9.209E-01	%(P	2.123E+00	6.41E-01	G K
		92.80	1.904E+00	(P	1.624E+00	5.05E-01	G
		92.38	2.175E+00	(P	1.920E+00	5.95E-01	G
AM-241	4.7224E-03						
		59.54	4.722E-03	%(P	2.883E-01	8.57E-02	G

(- This peak used in the nuclide activity average.

* - Peak is too wide, but only one peak in library.
! - Peak is part of a multiplet and this area went negative during deconvolution.
? - Peak is too narrow.
@ - Peak is too wide at FW25M, but ok at FWHM.
% - Peak fails sensitivity test.
$ - Peak identified, but first peak of this nuclide failed one or more qualification tests.
\+ - Peak activity higher than counting uncertainty range.
\- - Peak activity lower than counting uncertainty range.
= - Peak outside analysis energy range.
& - Calculated peak centroid is not close enough to the library energy centroid for positive identification.
P - Peakbackground subtraction
} - Peak is too close to another for the activity to be found directly.

Nuclide Codes:	Peak Codes:
T - Thermal Neutron Activation	G - Gamma Ray
F - Fast Neutron Activation	X - X-Ray
I - Fission Product	P - Positron Decay
N - Naturally Occurring Isotope	S - Single-Escape
P - Photon Reaction	D - Double-Escape
C - Charged Particle Reaction	K - Key Line
M - No MDA Calculation	A - Not in Average
R - Coincidence Corrected	C - Coincidence Peak
H - Halflife limit exceeded	

- -

***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	-4.7626E-02	-4.9266E-02	3.5624E-01	3.5625E-01	3.949E-01
K-40		1.4703E+01	1.4703E+01	1.7535E+00	1.9403E+00	
MN-54	#A	2.2721E-02	2.2853E-02	4.5314E-02	4.5332E-02	4.976E-02
CO-57	#B	1.1288E-02	1.1363E-02	4.1754E-02	4.1759E-02	4.607E-02
CO-60	#B	-5.6830E-03	-5.6884E-03	5.2027E-02	5.2028E-02	5.816E-02
Sr-85	#A	-9.4574E-03	-9.7247E-03	4.5074E-02	4.5077E-02	4.964E-02
Kr-85	#A	-2.4352E+02	-2.4353E+02	1.2424E+03	1.2424E+03	1.151E+03
Y-88	#B	4.1516E-03	4.2226E-03	2.7805E-02	2.7806E-02	3.560E-02
NB-94	#B	-1.9769E-04	-1.9769E-04	1.2138E-02	1.2138E-02	5.408E-02
Ag-108M	#B	8.9327E-03	8.9331E-03	4.6345E-02	4.6348E-02	5.332E-02
CD-109	#A	3.3640E-02	3.3774E-02	1.3368E+00	1.3368E+00	1.487E+00
SN-113	#B	-4.0219E-03	-4.0855E-03	5.6657E-02	5.6658E-02	6.382E-02
SB-125	#B	4.8640E-02	4.8727E-02	1.0935E-01	1.0939E-01	1.212E-01
I-131	#B	-2.0587E-03	-2.5776E-03	4.9300E-02	4.9301E-02	4.521E-02
CS-134	#B	1.8024E-02	1.8067E-02	2.2282E-02	2.2306E-02	4.513E-02
CS-137	#A	5.7389E-03	5.7399E-03	4.4720E-02	4.4721E-02	5.212E-02
CE-139	#A	-1.0683E-03	-1.0825E-03	5.8210E-02	5.8210E-02	4.941E-02
EU-152	#B	-1.4963E-02	-1.4969E-02	1.3437E-01	1.3437E-01	1.338E-01
EU-154	#B	2.5510E-02	2.5525E-02	9.2997E-02	9.3008E-02	1.032E-01
EU-155	#B	-1.5694E-03	-1.5710E-03	1.5128E-01	1.5128E-01	1.689E-01
HG-203	#B	6.5877E-04	6.8482E-04	4.0019E-02	4.0019E-02	4.391E-02
TL-208		2.8594E-01	2.8594E-01	8.1914E-02	8.3492E-02	
PB-212		7.6631E-01	7.6631E-01	1.0353E-01	1.1222E-01	
PB-214		3.9797E-01	3.9797E-01	1.1324E-01	1.1545E-01	
BI-212	#	5.2001E-01	5.2001E-01	4.2291E-01	4.2393E-01	4.243E-01
BI-214		4.7370E-01	4.7370E-01	1.3254E-01	1.3522E-01	
RA-224	#A	6.7234E-01	6.7234E-01	1.1532E+00	1.1538E+00	1.265E+00
RA-226	#A	9.4751E-01	9.4751E-01	1.1250E+00	1.1262E+00	1.218E+00
AC-228		8.8896E-01	8.8896E-01	2.0249E-01	2.0863E-01	
TH-227	#B	-1.9013E-01	-1.9013E-01	4.2306E-01	4.2319E-01	4.583E-01
PA-234	#B	-4.3108E-02	-4.3108E-02	1.4741E-01	1.4743E-01	1.636E-01
TH-234	#B	1.5726E+00	1.5726E+00	1.2480E+00	1.2510E+00	2.123E+00
AM-241	#A	4.7224E-03	4.7224E-03	2.5714E-01	2.5714E-01	2.883E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (269.6 to 1999.1 keV) 1.7515520E+01 pCi/gm
Total Decayed Activity (269.6 to 1999.1 keV) 1.7515520E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
DAT

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 101F_27JUL2006_1254.An1

Sample description
FSS-OOL-05-06-011-F-RC

Spectrum Filename: C:\GammaVision\Spectra\101F_27JUL2006_1254.An1

Acquisition information
Start time: 27-Jul-2006 12:54:27
Live time: 2000
Real time: 2002
Dead time: 0.11 %
Detector ID: 1

Detector system
Det 101- DSPE-633

Calibration
Filename: D1_1LSa.Clb
Detector 101 1.0 Liter Marinelli Sand

Energy Calibration
Created: 03-Sep-2004 08:50:48
Zero offset: 0.244 keV
Gain: 0.500 keV/channel
Quadratic: -2.493E-08 keV/channel^2

Efficiency Calibration
Created: 03-Sep-2004 08:52:26
Type: Polynomial
Uncertainty: 0.626 %
Coefficients: -0.321775 -5.816463 0.734234
-0.099357 0.006049 -0.000149

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.23keV)
Stop channel: 4000 (1999.11keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 1.9700E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.9700E+03) =
5.0761E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	24-Jul-2006 21:23:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	101_150K_28APR05.Pbc 01-May-2005 05:24:47
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 16 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.4407

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
74.87	204.	23.44	1.50	1.654E-02				
74.87	204.	23.44	1.50	1.654E-02	74.81	9.600	8.828E-01	PB212
77.15	298.	16.01	1.50	1.720E-02	77.11	10.700	1.109E+00	PB214
					77.11	17.500	6.783E-01	PB212
77.15	301.	16.01	1.50	1.720E-02	77.11	10.700	1.109E+00	PB214
					77.11	17.500	6.867E-01	PB212
87.32	136.	21.59	1.01	1.925E-02	86.45	32.740	1.495E-01	EU155
89.88	100.	28.11	1.02	1.958E-02				
93.48	112.	26.58	1.02	1.998E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
186.37	152.	22.45	1.65	1.856E-02	185.99	3.280	1.711E+00	RA226
238.97	754.	4.26	1.12	1.556E-02	238.63	43.100	7.639E-01	PB212
					241.92	7.470	4.490E+00	PB214
242.18	102.	21.06	1.12	1.539E-02				
277.63	46.	41.44	1.50	1.360E-02	279.17	81.500	PBC<MDA	HG203
295.61	171.	12.42	1.42	1.290E-02	295.22	19.200	4.677E-01	PB214
338.82	182.	13.94	1.11	1.134E-02	338.40	12.010	9.049E-01	AC228
352.28	286.	10.02	1.31	1.092E-02	351.99	37.100	4.804E-01	PB214
463.70	41.	36.96	1.50	8.342E-03	463.51	10.000	PBC<MDA	SB125
511.25	105.	17.85	1.98	7.583E-03	510.72	22.500	3.574E-01	TL208
583.77	238.	10.25	1.23	6.678E-03	583.14	86.000	2.818E-01	TL208
609.78	202.	9.97	1.45	6.408E-03	609.32	46.090	4.662E-01	BI214
728.35	47.	25.36	1.03	5.435E-03				
911.78	139.	10.33	1.43	4.443E-03	911.07	29.000	7.295E-01	AC228
969.53	122.	17.74	1.80	4.210E-03	968.90	17.460	1.131E+00	AC228
1121.15	75.	24.62	1.07	3.708E-03	1120.28	15.040	9.171E-01	BI214
1461.80	695.	4.02	1.98	2.941E-03	1460.75	10.700	1.510E+01	K40

1765.37	39.	17.32	1.10	2.481E-03	1764.51	15.920	6.818E-01	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
174.35	87.50	401.	116.	0.058	78.55	1.014	PB-214	D
179.34	90.06	346.	100.	0.050	84.34	1.016	PB-214	lD
477.65	238.94	139.	754.	0.377	12.78	1.122	PB-212	D
484.06	242.15	179.	102.	0.051	63.17	1.124	PB-214	D
1456.86	728.35	39.	47.	0.024	71.08	1.027	J-132	s

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-212	149.31	74.87	1108.	204.	0.102	70.33	1.499
PB-214	153.79	77.11	1017.	298.	0.149	48.03	1.499D
PB-212	153.79	77.11	1014.	301.	0.151	48.03	1.499D
TH-234	185.38	92.90	985.	123.	0.061	102.33	1.499s
TH-234	185.39	92.90	918.	139.	0.069	91.78	1.499s
RA-226	372.08	186.21	515.	125.	0.062	81.75	1.499s
PB-212	477.57	238.94	454.	592.	0.296	19.39	1.499
HG-203	555.00	277.63	156.	46.	0.023	124.33	1.499s
PB-214	591.03	295.64	201.	172.	0.086	41.35	1.499s
AC-228	677.43	338.82	156.	180.	0.090	41.83	1.110s
PB-214	704.42	352.31	144.	237.	0.118	28.73	1.499
SB-125	927.30	463.70	105.	41.	0.021	110.87	1.499s
TL-208	1022.44	511.25	93.	89.	0.044	53.56	1.975s
TL-208	1167.55	583.77	105.	236.	0.118	30.74	1.229
BI-214	1219.59	609.78	69.	201.	0.100	29.92	1.448
AC-228	1823.91	911.78	30.	137.	0.069	30.99	1.432
AC-228	1939.44	969.51	54.	107.	0.054	46.66	1.795
BI-214	2242.88	1121.15	70.	75.	0.037	73.86	1.073s
K-40	2924.62	1461.80	19.	693.	0.346	12.07	1.980
BI-214	3532.18	1765.37	3.	39.	0.020	51.97	1.095s

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	Peak MDA Value pCi/gm	COMMENTS
BE-7		1.6985E-01					
			477.56	1.698E-01	%(	3.185E-01 9.74E-02	G
K-40		1.5097E+01					
			1460.75	1.510E+01	(P	5.025E-01 6.10E-01	G
MN-54		6.1404E-03					
			834.81	6.140E-03	&(P	4.076E-02 1.15E-02	G
CO-57		1.4576E-02					
			122.07	1.458E-02	%(	4.604E-02 1.39E-02	G K
			136.43	-4.881E-02	%	4.072E-01 1.22E-01	G
CO-60		-5.4727E-04					
			1332.51	-5.473E-04	&(P	6.852E-02 1.90E-02	G K
			1173.23	-1.156E-02	% P	7.515E-02 2.17E-02	G K
Sr-85		-8.4280E-03					
			514.00	-8.428E-03	&(	5.408E-02 1.59E-02	G
Kr-85		-2.1512E+02					
			513.99	-2.151E+02	&(P	1.219E+03 3.57E+02	G
Y-88		0.0000E+00					
			1836.01	0.000E+00	%(	4.868E-02 1.24E-02	G K
			898.02	-4.045E-03	% P	4.053E-02 1.12E-02	G
NB-94		4.5185E-03					
			871.10	4.519E-03	&(P	3.929E-02 1.10E-02	G K
			702.50	1.466E-02	% P	4.665E-02 1.38E-02	G K
Ag-108M		1.0511E-02					
			722.95	1.051E-02	%(	4.837E-02 1.41E-02	G K
			614.37	-3.216E-02	% P	5.830E-02 1.78E-02	G
			433.93	-2.145E-04	%	4.434E-02 1.28E-02	G
CD-109		4.6052E-01					
			88.04	4.605E-01	%(P	1.240E+00 3.74E-01	G
SN-113		-1.1231E-03					
			391.71	-1.123E-03	%(	4.736E-02 1.35E-02	G K
			255.04	-8.204E-02	& P	1.943E+00 5.72E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	1.0489E-01						
		427.95	2.511E-02	%(P	1.172E-01	3.44E-02	G K
		600.77	4.686E-02	% P	1.910E-01	5.56E-02	G
		636.15	-8.362E-02	% P	3.976E-01	1.16E-01	G
		463.51	3.410E-01	*(P	4.164E-01	1.30E-01	G
		176.29	2.032E-01	% P	5.896E-01	1.77E-01	G
I-131	-9.6380E-03						
		364.48	-9.638E-03	%(	5.750E-02	1.69E-02	G K
		636.97	-1.429E-01	&	7.252E-01	2.11E-01	G
		284.29	-7.142E-02	%	8.175E-01	2.41E-01	G
CS-134	-8.9934E-05						
		604.66	-8.993E-05	&(P	4.389E-02	1.24E-02	G K
		795.76	3.580E-02	% P	6.189E-02	1.90E-02	G
		569.29	9.493E-02	% P	2.422E-01	7.24E-02	G
		801.84	-5.172E-02	%	5.800E-01	1.66E-01	G
CS-137	-2.6608E-03						
		661.62	-2.661E-03	%(P	6.065E-02	1.72E-02	G
CE-139	5.4732E-03						
		165.85	5.473E-03	&(P	4.307E-02	1.28E-02	G
EU-152	4.0820E-02						
		121.78	4.082E-02	%(P	1.384E-01	4.16E-02	G K
		344.30	-3.000E-02	% P	1.491E-01	4.40E-02	G
		1408.08	-2.311E-03	% P	2.141E-01	5.59E-02	G
		964.00	1.265E-01	% P	4.203E-01	1.24E-01	G
		1112.07	-1.468E-03	& P	5.867E-01	1.67E-01	G
		778.90	-2.706E-03	% P	3.673E-01	1.03E-01	G
EU-154	5.2839E-03						
		123.10	5.284E-03	%(P	1.047E-01	3.12E-02	G K
		1274.80	2.767E-02	% P	1.706E-01	4.87E-02	G
		723.30	4.465E-03	% P	3.274E-01	9.42E-02	G
		1004.80	-1.207E-02	& P	2.857E-01	7.95E-02	G
EU-155	1.1691E-02						
		86.45	1.169E-02	%(	1.746E-01	5.22E-02	G K
		105.31	7.861E-02	%	1.985E-01	6.00E-02	G
HG-203	2.9389E-02						
		279.17	2.939E-02	*(	3.923E-02	1.22E-02	G K
		72.87	-1.180E-02	% P	1.426E+00	4.27E-01	G
		70.83	4.280E-02	%	2.578E+00	7.72E-01	G
		82.50	0.000E+00	&	2.705E+00	8.07E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	2.9744E-01						
		583.14	2.818E-01	(P	6.018E-02	2.92E-02	G
		510.72	3.574E-01	*(P	1.914E-01	7.54E-02	G
PB-212	6.2857E-01						
		238.63	6.050E-01	(P	1.042E-01	3.95E-02	G K
							Energy duplication
		77.11	6.867E-01	(	3.442E-01	1.10E-01	G
		74.81	8.828E-01	& P	6.818E-01	2.12E-01	G
PB-214	4.2572E-01						
		351.99	4.005E-01	(P	9.913E-02	3.87E-02	G K
		295.22	4.744E-01	@(P	1.900E-01	6.61E-02	G
							Energy duplication
		77.11	1.109E+00	+ P	5.640E-01	1.80E-01	G
		241.92	3.173E-02	% P	7.004E-01	2.08E-01	G
BI-212	-1.1078E-02						
		727.17	-1.108E-02	%(P	4.342E-01	1.23E-01	G K
		1620.56	3.948E-01	%	1.075E+00	3.15E-01	G
		785.42	-1.354E-02	& P	2.671E+00	7.54E-01	G
BI-214	4.6625E-01						
		609.32	4.662E-01	(P	9.620E-02	4.68E-02	G K
		1764.51	6.818E-01	+ P	1.810E-01	1.19E-01	G
		1120.28	9.171E-01	+ P	5.138E-01	2.27E-01	G
RA-224	7.5356E-01						
		241.00	7.536E-01	%(P	1.223E+00	3.73E-01	G
RA-226	1.4032E+00						
		185.99	1.403E+00	*(	1.220E+00	3.82E-01	G
AC-228	7.8087E-01						
		911.07	7.295E-01	(P	1.499E-01	7.64E-02	G K
		968.90	1.002E+00	+ P	3.435E-01	1.57E-01	G
		338.40	9.049E-01	@(P	3.067E-01	1.28E-01	G
TH-227	-2.5329E-01						
		236.00	-2.533E-01	%(P	4.662E-01	1.42E-01	G K
		256.25	-3.432E-02	& P	5.167E-01	1.51E-01	G
PA-234	-5.1587E-02						
		98.44	-5.159E-02	%(	1.770E-01	5.33E-02	G K
		946.00	-4.912E-02	%	2.901E-01	8.38E-02	G
		131.28	4.953E-02	&	1.848E-01	5.55E-02	G
		94.67	-4.802E-02	&	3.282E-01	9.83E-02	G
		883.24	-2.397E-02	%	4.002E-01	1.12E-01	G
		926.70	-1.075E-01	&	4.425E-01	1.29E-01	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26 1.448E-01 %   3.571E-01 1.07E-01 G

TH-234       1.0377E+00
                           63.29 2.033E-01 %(P 2.220E+00 6.62E-01 G K
                           92.80 1.596E+00 &(P 1.654E+00 5.10E-01 G
                           92.38 1.653E+00 &(P 2.003E+00 6.14E-01 G

AM-241       4.5591E-04
                           59.54 4.559E-04 %(P 3.050E-01 9.07E-02 G
   ( - This peak used in the nuclide activity average.

   * - Peak is too wide, but only one peak in library.
   ! - Peak is part of a multiplet and this area went
       negative during deconvolution.
   ? - Peak is too narrow.
   @ - Peak is too wide at FW25M, but ok at FWHM.
   % - Peak fails sensitivity test.
   $ - Peak identified, but first peak of this nuclide
       failed one or more qualification tests.
   + - Peak activity higher than counting uncertainty range.
   - - Peak activity lower than counting uncertainty range.
   = - Peak outside analysis energy range.
   & - Calculated peak centroid is not close enough to the
       library energy centroid for positive identification.
   P - Peakbackground subtraction
   } - Peak is too close to another for the activity
       to be found directly.

   Nuclide Codes:                      Peak Codes:
   T - Thermal Neutron Activation      G - Gamma Ray
   F - Fast Neutron Activation         X - X-Ray
   I - Fission Product                 P - Positron Decay
   N - Naturally Occurring Isotope     S - Single-Escape
   P - Photon Reaction                 D - Double-Escape
   C - Charged Particle Reaction       K - Key Line
   M - No MDA Calculation              A - Not in Average
   R - Coincidence Corrected           C - Coincidence Peak
   H - Halflife limit exceeded

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
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***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	1.6411E-01	1.6985E-01	2.9213E-01	2.9228E-01	3.077E-01
K-40		1.5097E+01	1.5097E+01	1.8285E+00	2.0177E+00	
MN-54	#A	6.1044E-03	6.1404E-03	3.4618E-02	3.4620E-02	4.052E-02
CO-57	#B	1.4477E-02	1.4576E-02	4.1578E-02	4.1586E-02	4.572E-02
CO-60	#B	-5.4675E-04	-5.4727E-04	1.1611E-01	1.1611E-01	6.845E-02

Sr-85	#A	-8.1929E-03	-8.4280E-03	4.7666E-02	4.7669E-02	5.257E-02
Kr-85	#A	-2.1511E+02	-2.1512E+02	1.3498E+03	1.3498E+03	1.219E+03
Y-88	#B	0.0000E+00	0.0000E+00	3.7076E-02	3.7077E-02	4.785E-02
NB-94	#B	4.5185E-03	4.5185E-03	3.2994E-02	3.2995E-02	3.929E-02
Ag-108M	#B	1.0510E-02	1.0511E-02	4.2203E-02	4.2208E-02	4.837E-02
CD-109	#A	4.5866E-01	4.6052E-01	1.1235E+00	1.1238E+00	1.235E+00
SN-113	#B	-1.1053E-03	-1.1231E-03	4.0530E-02	4.0530E-02	4.661E-02
SB-125	#B	1.0470E-01	1.0489E-01	1.2035E-01	1.2050E-01	1.169E-01
I-131	#B	-7.6716E-03	-9.6380E-03	5.0739E-02	5.0742E-02	4.577E-02
CS-134	#B	-8.9716E-05	-8.9934E-05	4.8607E-02	4.8607E-02	4.379E-02
CS-137	#A	-2.6604E-03	-2.6608E-03	1.3768E-01	1.3768E-01	6.064E-02
CE-139	#A	5.4007E-03	5.4732E-03	3.8398E-02	3.8400E-02	4.250E-02
EU-152	#B	4.0804E-02	4.0820E-02	1.2485E-01	1.2487E-01	1.383E-01
EU-154	#B	5.2808E-03	5.2839E-03	9.3478E-02	9.3478E-02	1.046E-01
EU-155	#B	1.1680E-02	1.1691E-02	1.5662E-01	1.5662E-01	1.744E-01
HG-203	#A	2.8255E-02	2.9389E-02	3.6539E-02	3.6577E-02	3.772E-02
TL-208		2.9744E-01	2.9744E-01	9.2354E-02	9.3870E-02	
PB-212	#	6.2857E-01	6.2857E-01	1.2312E-01	1.2814E-01	1.042E-01
PB-214	#	4.2572E-01	4.2572E-01	1.0821E-01	1.1085E-01	9.913E-02
BI-212	#B	-1.1078E-02	-1.1078E-02	1.7534E+00	1.7534E+00	4.342E-01
BI-214		4.6625E-01	4.6625E-01	1.4029E-01	1.4275E-01	
RA-224	#A	7.5356E-01	7.5356E-01	1.1198E+00	1.1206E+00	1.223E+00
RA-226	#	1.4032E+00	1.4032E+00	1.1471E+00	1.1499E+00	1.220E+00
AC-228		7.8087E-01	7.8087E-01	2.0584E-01	2.1051E-01	
TH-227	#B	-2.5329E-01	-2.5329E-01	4.3096E-01	4.3119E-01	4.662E-01
PA-234	#B	-5.1587E-02	-5.1587E-02	1.5976E-01	1.5979E-01	1.770E-01
TH-234	#B	1.0377E+00	1.0377E+00	9.9487E-01	9.9653E-01	2.220E+00
AM-241	#A	4.5591E-04	4.5591E-04	2.7219E-01	2.7219E-01	3.050E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (295.1 to 1999.1 keV) 1.6641554E+01 pCi/gm
Total Decayed Activity (295.1 to 1999.1 keV) 1.6641554E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
DAT

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 101F_27JUL2006_1332.An1

Sample description
FSS-OOL-05-06-013-F

Spectrum Filename: C:\GammaVision\Spectra\101F_27JUL2006_1332.An1

Acquisition information
Start time: 27-Jul-2006 13:32:18
Live time: 2000
Real time: 2002
Dead time: 0.09 %
Detector ID: 1

Detector system
Det 101- DSPE-633

Calibration
Filename: D1_1LSa.Clb
Detector 101 1.0 Liter Marinelli Sand

Energy Calibration
Created: 03-Sep-2004 08:50:48
Zero offset: 0.244 keV
Gain: 0.500 keV/channel
Quadratic: -2.493E-08 keV/channel^2

Efficiency Calibration
Created: 03-Sep-2004 08:52:26
Type: Polynomial
Uncertainty: 0.626 %
Coefficients: -0.321775 -5.816463 0.734234
-0.099357 0.006049 -0.000149

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.23keV)
Stop channel: 4000 (1999.11keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 1.6130E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.6130E+03) =
6.1996E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	24-Jul-2006 21:03:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	101_150K_28APR05.Pbc 01-May-2005 05:24:47
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 13 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.4115

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
74.20	89.	33.98	1.00	1.651E-02				
74.20	89.	33.98	1.00	1.651E-02	74.81	9.600	PBC<MDA	PB212
77.32	283.	10.05	1.01	1.740E-02	77.11	10.700	1.273E+00	PB214
					77.11	17.500	7.887E-01	PB212
87.30	101.	33.64	0.87	1.922E-02	86.45	32.740	1.358E-01	EU155
128.97	74.	36.00	0.75	2.110E-02				
186.22	101.	24.76	1.05	1.857E-02	185.99	3.280	1.383E+00	RA226
209.77	59.	39.69	1.08	1.719E-02				
238.97	639.	4.58	1.12	1.556E-02	238.63	43.100	7.896E-01	PB212
241.92	74.	29.97	1.12	1.541E-02	241.00	3.900	PBC<MDA	RA224
270.58	89.	29.45	1.49	1.399E-02				
295.56	113.	14.63	1.16	1.291E-02	295.22	19.200	3.744E-01	PB214
300.36	40.	36.21	1.16	1.272E-02				
328.53	45.	34.97	0.90	1.168E-02				
338.82	131.	16.18	1.07	1.134E-02	338.40	12.010	7.899E-01	AC228
352.23	262.	10.18	1.37	1.092E-02	351.99	37.100	5.377E-01	PB214
463.35	52.	33.98	0.94	8.344E-03				
463.35	52.	33.98	0.94	8.344E-03	463.51	10.000	5.067E-01	SB125
511.28	73.	21.20	1.82	7.582E-03	510.72	22.500	2.795E-01	TL208
583.70	200.	11.42	1.44	6.678E-03	583.14	86.000	2.874E-01	TL208
609.89	169.	11.11	1.51	6.407E-03	609.32	46.090	4.753E-01	BI214
727.96	39.	30.66	1.09	5.438E-03	727.17	11.800	4.999E-01	BI212
795.43	42.	32.54	1.32	5.018E-03				
795.43	42.	32.54	1.32	5.018E-03	795.76	85.400	8.113E-02	CS134
911.83	136.	12.85	1.18	4.443E-03	911.07	29.000	8.721E-01	AC228
968.77	86.	16.39	0.83	4.213E-03	968.90	17.460	9.761E-01	AC228
1461.89	540.	4.35	2.01	2.940E-03	1460.75	10.700	1.431E+01	K40

1765.64	14.	28.61	1.14	2.481E-03	1764.51	15.920	3.025E-01	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
419.21	209.77	226.	59.	0.030	119.06	1.084	NP-239	s
477.65	238.89	108.	639.	0.319	13.73	1.122	PB-212	D
483.54	241.83	211.	74.	0.037	89.90	1.124	PB-214	D
540.90	270.58	205.	89.	0.044	88.35	1.491	AC-228	s
600.06	300.16	101.	55.	0.028	90.45	1.630	PB-212	s
656.84	328.53	91.	45.	0.022	104.91	0.903	RH-106M	
926.60	463.35	78.	52.	0.026	101.95	0.938	SB-125	l
1591.08	795.43	46.	42.	0.021	97.62	1.317	CS-134	l

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-212	149.08	74.76	842.	122.	0.061	100.26	1.499s
PB-214	153.79	77.11	710.	254.	0.127	47.60	1.499D
PB-212	153.79	77.11	707.	258.	0.129	47.60	1.499D
EU-155	174.23	87.33	734.	102.	0.051	116.43	1.499
RA-226	371.76	186.05	333.	100.	0.050	82.82	1.499s
PB-212	477.59	238.94	328.	490.	0.245	20.41	1.499
PB-214	590.93	295.59	171.	109.	0.054	57.36	1.499s
AC-228	677.43	338.82	119.	129.	0.064	48.55	1.074
PB-214	704.46	352.33	102.	230.	0.115	26.87	1.499
TL-208	1022.49	511.28	80.	57.	0.028	63.59	1.819s
TL-208	1167.41	583.70	89.	197.	0.099	34.25	1.440
BI-214	1219.81	609.89	58.	168.	0.084	33.34	1.506
BI-212	1455.99	727.92	39.	34.	0.017	91.98	1.499
AC-228	1824.01	911.83	48.	134.	0.067	38.55	1.178
AC-228	1937.95	968.77	34.	86.	0.043	49.18	0.827s
K-40	2924.80	1461.89	5.	538.	0.269	13.05	2.005
BI-214	3532.71	1765.64	2.	14.	0.007	85.84	1.142s

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	Peak MDA Value pCi/gm	COMMENTS
BE-7		1.0941E-01					
			477.56	1.094E-01	%(	3.555E-01 1.05E-01	G
K-40		1.4309E+01					
			1460.75	1.431E+01	(P	3.570E-01 6.26E-01	G
MN-54		-7.3290E-04					
			834.81	-7.329E-04	&(P	5.531E-02 1.53E-02	G
CO-57		-1.0413E-02					
			122.07	-1.041E-02	%(	4.814E-02 1.44E-02	G K
			136.43	1.016E-01	%	4.137E-01 1.24E-01	G
CO-60		1.6477E-02					
			1332.51	1.648E-02	&(P	5.395E-02 1.56E-02	G K
			1173.23	9.079E-03	& P	7.421E-02 2.11E-02	G K
Sr-85		-6.0803E-03					
			514.00	-6.080E-03	&(	5.640E-02 1.64E-02	G
Kr-85		-1.6680E+02					
			513.99	-1.668E+02	&(P	1.272E+03 3.68E+02	G
Y-88		5.5869E-04					
			1836.01	5.587E-04	%(	4.547E-02 1.09E-02	G K
			898.02	3.645E-03	% P	4.228E-02 1.15E-02	G
NB-94		-2.4144E-04					
			871.10	-2.414E-04	&(P	5.695E-02 1.58E-02	G K
			702.50	-5.295E-03	% P	5.028E-02 1.43E-02	G K
Ag-108M		1.6233E-03					
			722.95	1.623E-03	%(	5.583E-02 1.56E-02	G K
			614.37	-2.447E-02	& P	6.727E-02 2.01E-02	G
			433.93	5.368E-03	&	4.551E-02 1.32E-02	G
CD-109		4.9830E-02					
			88.04	4.983E-02	%(P	1.577E+00 4.70E-01	G
SN-113		5.2785E-03					
			391.71	5.279E-03	%(	6.638E-02 1.92E-02	G K
			255.04	3.293E-01	% P	2.009E+00 5.94E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	-2.5423E-02						
		427.95	-2.542E-02	&(P	1.578E-01	4.61E-02	G K
		600.77	8.845E-02	% P	2.178E-01	6.52E-02	G
		636.15	5.274E-02	% P	3.678E-01	1.05E-01	G
		463.51	2.936E-01	% P	4.264E-01	1.32E-01	G
		176.29	1.073E-01	& P	6.701E-01	1.99E-01	G
I-131	1.3926E-02						
		364.48	1.393E-02	%(	5.447E-02	1.61E-02	G K
		636.97	1.218E-01	%	6.495E-01	1.86E-01	G
		284.29	6.863E-02	&	8.941E-01	2.62E-01	G
CS-134	-1.6448E-02						
		604.66	-1.645E-02	%(P	5.564E-02	1.64E-02	G K
		795.76	3.736E-02	% P	5.958E-02	1.85E-02	G
		569.29	7.573E-02	% P	3.069E-01	8.98E-02	G
		801.84	-4.735E-04	%	5.682E-01	1.57E-01	G
CS-137	-3.4505E-03						
		661.62	-3.451E-03	&(P	5.353E-02	1.48E-02	G
CE-139	-7.8023E-03						
		165.85	-7.802E-03	&(P	5.376E-02	1.60E-02	G
EU-152	-3.4841E-02						
		121.78	-3.484E-02	%(P	1.457E-01	4.36E-02	G K
		344.30	-2.279E-02	% P	1.635E-01	4.78E-02	G
		1408.08	-4.545E-02	% P	2.743E-01	7.59E-02	G
		964.00	-2.315E-02	& P	4.908E-01	1.38E-01	G
		1112.07	-6.765E-02	& P	4.792E-01	1.36E-01	G
		778.90	-7.523E-03	% P	3.886E-01	1.08E-01	G
EU-154	-1.7418E-02						
		123.10	-1.742E-02	%(P	9.320E-02	2.77E-02	G K
		1274.80	-8.528E-03	& P	1.902E-01	5.24E-02	G
		723.30	3.745E-03	% P	2.628E-01	7.34E-02	G
		1004.80	-2.737E-02	& P	3.481E-01	9.76E-02	G
EU-155	1.3697E-01						
		86.45	1.370E-01	&(	1.730E-01	5.32E-02	G K
		105.31	3.732E-02	%	2.160E-01	6.46E-02	G
HG-203	-1.4663E-02						
		279.17	-1.466E-02	&(	5.960E-02	1.78E-02	G K
		72.87	-3.841E-01	& P	1.252E+00	3.76E-01	G
		70.83	6.617E-01	&	2.092E+00	6.30E-01	G
		82.50	-3.075E-01	&	2.304E+00	6.87E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	2.8578E-01						
		583.14	2.874E-01	(P	6.794E-02	3.32E-02	G
		510.72	2.795E-01	(P	2.178E-01	7.60E-02	G
PB-212	6.4212E-01						
		238.63	6.117E-01	(P	1.087E-01	4.21E-02	G K
							Energy duplication
		77.11	7.169E-01	(	3.522E-01	1.14E-01	G
		74.81	6.423E-01	?(P	7.279E-01	2.24E-01	G
PB-214	4.7580E-01						
		351.99	4.758E-01	(P	1.030E-01	4.30E-02	G K
		295.22	3.680E-01	- P	2.147E-01	7.15E-02	G
							Energy duplication
		77.11	1.156E+00	+ P	5.775E-01	1.86E-01	G
		241.92	1.022E-01	% P	7.206E-01	2.14E-01	G
BI-212	4.3811E-01						
		727.17	4.381E-01	(P	4.136E-01	1.37E-01	G K
		1620.56	0.000E+00	%	8.372E-01	1.14E-01	G
		785.42	-1.981E-02	& P	2.988E+00	8.37E-01	G
BI-214	4.7534E-01						
		609.32	4.753E-01	(P	1.085E-01	5.32E-02	G K
		1764.51	3.025E-01	- P	1.878E-01	8.92E-02	G
		1120.28	-7.600E-02	& P	5.424E-01	1.55E-01	G
RA-224	5.0420E-01						
		241.00	5.042E-01	&(P	1.370E+00	4.13E-01	G
RA-226	1.3792E+00						
		185.99	1.379E+00	@(	1.207E+00	3.81E-01	G
AC-228	8.8627E-01						
		911.07	8.721E-01	(P	2.269E-01	1.14E-01	G K
		968.90	9.761E-01	(P	3.419E-01	1.61E-01	G
		338.40	7.899E-01	(P	3.297E-01	1.30E-01	G
TH-227	-1.9353E-01						
		236.00	-1.935E-01	%(P	4.794E-01	1.45E-01	G K
		256.25	6.070E-02	% P	5.942E-01	1.75E-01	G
PA-234	-1.2390E-02						
		98.44	-1.239E-02	%(	1.911E-01	5.68E-02	G K
		946.00	-7.013E-02	%	3.280E-01	9.52E-02	G
		131.28	-3.995E-02	%	2.254E-01	6.74E-02	G
		94.67	-5.731E-03	&	3.437E-01	1.02E-01	G
		883.24	1.297E-01	%	4.256E-01	1.25E-01	G
		926.70	1.353E-01	%	5.032E-01	1.47E-01	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26 1.091E-01 %   4.542E-01 1.33E-01 G

TH-234       3.6519E-01
                           63.29 3.652E-01 &(P 2.298E+00 6.84E-01 G K
                           92.80 1.087E+00 % P 1.841E+00 5.60E-01 G
                           92.38 1.203E+00 % P 2.116E+00 6.42E-01 G

AM-241       5.8640E-02
                           59.54 5.864E-02 &(P 2.695E-01 8.05E-02 G
   ( - This peak used in the nuclide activity average.

   * - Peak is too wide, but only one peak in library.
   ! - Peak is part of a multiplet and this area went
       negative during deconvolution.
   ? - Peak is too narrow.
   @ - Peak is too wide at FW25M, but ok at FWHM.
   % - Peak fails sensitivity test.
   $ - Peak identified, but first peak of this nuclide
       failed one or more qualification tests.
   + - Peak activity higher than counting uncertainty range.
   - - Peak activity lower than counting uncertainty range.
   = - Peak outside analysis energy range.
   & - Calculated peak centroid is not close enough to the
       library energy centroid for positive identification.
   P - Peakbackground subtraction
   } - Peak is too close to another for the activity
       to be found directly.

   Nuclide Codes:                      Peak Codes:
   T - Thermal Neutron Activation      G - Gamma Ray
   F - Fast Neutron Activation         X - X-Ray
   I - Fission Product                 P - Positron Decay
   N - Naturally Occurring Isotope     S - Single-Escape
   P - Photon Reaction                 D - Double-Escape
   C - Charged Particle Reaction       K - Key Line
   M - No MDA Calculation              A - Not in Average
   R - Coincidence Corrected           C - Coincidence Peak
   H - Halflife limit exceeded

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
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***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	1.0566E-01	1.0941E-01	3.1473E-01	3.1479E-01	3.433E-01
K-40		1.4309E+01	1.4309E+01	1.8756E+00	2.0424E+00	
MN-54	#A	-7.2854E-04	-7.3290E-04	3.8245E-02	3.8245E-02	5.498E-02
CO-57	#B	-1.0341E-02	-1.0413E-02	4.3185E-02	4.3189E-02	4.781E-02
CO-60	#B	1.6461E-02	1.6477E-02	4.6922E-02	4.6931E-02	5.389E-02

Sr-85	#A	-5.9081E-03	-6.0803E-03	4.9152E-02	4.9153E-02	5.480E-02
Kr-85	#A	-1.6680E+02	-1.6680E+02	1.5938E+03	1.5938E+03	1.272E+03
Y-88	#B	5.4902E-04	5.5869E-04	3.2825E-02	3.2825E-02	4.469E-02
NB-94	#B	-2.4144E-04	-2.4144E-04	1.2614E-02	1.2614E-02	5.695E-02
Ag-108M	#B	1.6232E-03	1.6233E-03	4.6917E-02	4.6917E-02	5.583E-02
CD-109	#A	4.9626E-02	4.9830E-02	1.4086E+00	1.4086E+00	1.570E+00
SN-113	#B	5.1938E-03	5.2785E-03	5.7666E-02	5.7666E-02	6.531E-02
SB-125	#B	-2.5376E-02	-2.5423E-02	1.4986E-01	1.4986E-01	1.575E-01
I-131	#B	1.1046E-02	1.3926E-02	4.8180E-02	4.8186E-02	4.320E-02
CS-134	#B	-1.6408E-02	-1.6448E-02	5.4284E-02	5.4292E-02	5.550E-02
CS-137	#A	-3.4499E-03	-3.4505E-03	1.1079E-01	1.1079E-01	5.352E-02
CE-139	#A	-7.6973E-03	-7.8023E-03	5.0202E-02	5.0204E-02	5.304E-02
EU-152	#B	-3.4827E-02	-3.4841E-02	1.3904E-01	1.3905E-01	1.457E-01
EU-154	#B	-1.7407E-02	-1.7418E-02	9.2224E-02	9.2229E-02	9.314E-02
EU-155	#A	1.3683E-01	1.3697E-01	1.5947E-01	1.5965E-01	1.728E-01
HG-203	#B	-1.4088E-02	-1.4663E-02	5.3303E-02	5.3309E-02	5.726E-02
TL-208		2.8578E-01	2.8578E-01	9.9059E-02	1.0037E-01	
PB-212	#	6.4212E-01	6.4212E-01	1.3270E-01	1.3757E-01	1.087E-01
PB-214	#	4.7580E-01	4.7580E-01	1.2896E-01	1.3174E-01	1.030E-01
BI-212	#	4.3811E-01	4.3811E-01	4.1111E-01	4.1185E-01	4.136E-01
BI-214		4.7534E-01	4.7534E-01	1.5951E-01	1.6175E-01	
RA-224	#A	5.0420E-01	5.0420E-01	1.2382E+00	1.2385E+00	1.370E+00
RA-226	#	1.3792E+00	1.3792E+00	1.1423E+00	1.1449E+00	1.207E+00
AC-228		8.8627E-01	8.8627E-01	2.3681E-01	2.4205E-01	
TH-227	#B	-1.9353E-01	-1.9353E-01	4.4351E-01	4.4364E-01	4.794E-01
PA-234	#B	-1.2390E-02	-1.2390E-02	1.7046E-01	1.7046E-01	1.911E-01
TH-234	#B	3.6519E-01	3.6519E-01	2.0531E+00	2.0532E+00	2.298E+00
AM-241	#A	5.8639E-02	5.8640E-02	2.4158E-01	2.4160E-01	2.695E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (270.1 to 1999.1 keV) 1.5955930E+01 pCi/gm
Total Decayed Activity (270.1 to 1999.1 keV) 1.5955930E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
DAT

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 101F_27JUL2006_1413.An1

Sample description
FSS-OOL-05-06-018-F

Spectrum Filename: C:\GammaVision\Spectra\101F_27JUL2006_1413.An1

Acquisition information
Start time: 27-Jul-2006 14:13:09
Live time: 2000
Real time: 2002
Dead time: 0.08 %
Detector ID: 1

Detector system
Det 101- DSPE-633

Calibration
Filename: D1_1LSa.Clb
Detector 101 1.0 Liter Marinelli Sand

Energy Calibration
Created: 03-Sep-2004 08:50:48
Zero offset: 0.244 keV
Gain: 0.500 keV/channel
Quadratic: -2.493E-08 keV/channel^2

Efficiency Calibration
Created: 03-Sep-2004 08:52:26
Type: Polynomial
Uncertainty: 0.626 %
Coefficients: -0.321775 -5.816463 0.734234
-0.099357 0.006049 -0.000149

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.23keV)
Stop channel: 4000 (1999.11keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 1.6700E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.6700E+03) =
5.9880E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	24-Jul-2006 20:25:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	101_150K_28APR05.Pbc 01-May-2005 05:24:47
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 12 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.4795

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
74.43	114.	22.84	1.00	1.659E-02	72.87	6.400	PBC<MDA	HG203
					74.81	9.600	PBC<MDA	PB212
77.21	271.	9.98	1.01	1.737E-02	77.11	10.700	1.173E+00	PB214
					77.11	17.500	7.271E-01	PB212
93.19	116.	30.33	1.50	1.989E-02	88.04	3.790	PBC<MDA	CD109
					92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
93.23	107.	31.46	1.50	1.985E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
186.54	93.	25.63	1.31	1.855E-02	185.99	3.280	1.235E+00	RA226
209.44	72.	37.96	1.29	1.721E-02				
238.97	496.	5.42	1.12	1.556E-02	238.63	43.100	5.910E-01	PB212
242.15	89.	20.74	1.12	1.539E-02	241.00	3.900	1.180E+00	RA224
278.04	36.	35.48	0.67	1.365E-02				
295.59	133.	13.33	0.95	1.291E-02	295.22	19.200	4.287E-01	PB214
300.58	49.	27.61	1.74	1.271E-02				
328.60	65.	23.64	2.04	1.168E-02				
338.68	152.	16.60	0.92	1.134E-02	338.40	12.010	8.864E-01	AC228
352.45	200.	10.28	1.33	1.091E-02	351.99	37.100	3.946E-01	PB214
463.03	35.	37.24	0.90	8.350E-03				
463.03	35.	37.24	0.90	8.350E-03	463.51	10.000	PBC<MDA	SB125
510.36	108.	16.33	1.76	7.596E-03	510.72	22.500	4.367E-01	TL208
583.65	176.	10.84	1.50	6.679E-03	583.14	86.000	2.451E-01	TL208
609.80	151.	10.98	1.49	6.408E-03	609.32	46.090	4.107E-01	BI214
861.42	31.	32.41	1.14	4.673E-03				
911.78	118.	14.07	1.56	4.443E-03	911.07	29.000	7.288E-01	AC228
969.01	76.	17.59	1.67	4.212E-03	968.90	17.460	8.327E-01	AC228

1120.28	53.	23.76	0.99	3.711E-03	1120.28	15.040	7.629E-01	BI214
1461.98	531.	4.42	1.63	2.940E-03	1460.75	10.700	1.358E+01	K40

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
148.43	74.97	285.	114.	0.057	68.52	1.005	PB-214	D
153.98	77.74	230.	271.	0.135	29.95	1.007	PB-214	D
418.55	209.44	270.	72.	0.036	113.88	1.287	AC-228	s
477.64	238.97	114.	496.	0.248	16.26	1.122	PB-212	D
484.00	242.15	124.	89.	0.044	62.21	1.124	PB-214	D
600.92	300.58	67.	49.	0.024	82.82	1.742	PB-212	s
656.99	328.60	74.	65.	0.032	70.91	2.041	RH-106M	s
1723.13	861.42	25.	31.	0.016	97.24	1.137	TL-208	s

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-212	149.06	74.74	741.	122.	0.061	94.07	1.499
PB-214	153.79	77.11	638.	202.	0.101	55.88	1.499D
PB-212	153.79	77.11	634.	206.	0.103	55.88	1.499D
TH-234	186.04	93.23	634.	107.	0.053	94.37	1.499s
TH-234	185.97	93.19	636.	116.	0.058	90.98	1.499s
RA-226	372.37	186.36	307.	98.	0.049	81.62	1.499s
PB-212	477.56	238.93	280.	409.	0.205	22.41	1.499
RA-224	484.43	242.37	314.	66.	0.033	117.80	1.499
PB-214	590.95	295.60	123.	129.	0.065	44.20	1.499s
AC-228	677.15	338.68	140.	149.	0.075	49.81	0.922s
PB-214	704.58	352.39	91.	206.	0.103	28.35	1.499
TL-208	1020.66	510.36	80.	92.	0.046	49.00	1.763s
TL-208	1167.24	583.62	65.	177.	0.089	33.58	1.507s
BI-214	1219.63	609.80	47.	150.	0.075	32.93	1.491
AC-228	1823.92	911.78	47.	116.	0.058	42.20	1.564
AC-228	1938.44	969.01	34.	76.	0.038	52.76	1.666s
BI-214	2241.15	1120.28	33.	53.	0.026	71.28	0.995s
K-40	2924.98	1461.98	7.	529.	0.264	13.25	1.635

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	MDA Value pCi/gm	COMMENTS
BE-7		-4.7045E-02					
			477.56	-4.705E-02	%(	3.995E-01 1.15E-01	G
K-40		1.3584E+01					
			1460.75	1.358E+01	(P	3.972E-01 6.03E-01	G
MN-54		4.6454E-03					
			834.81	4.645E-03	&(P	4.481E-02 1.25E-02	G
CO-57		4.8121E-03					
			122.07	4.812E-03	&(	4.045E-02 1.20E-02	G K
			136.43	1.090E-01	%	3.673E-01 1.10E-01	G
CO-60		-1.5427E-02					
			1332.51	-1.543E-02	%(P	6.921E-02 1.99E-02	G K
			1173.23	2.867E-02	% P	6.158E-02 1.86E-02	G K
Sr-85		-1.8629E-02					
			514.00	-1.863E-02	%(	5.554E-02 1.66E-02	G
Kr-85		-4.4698E+02					
			513.99	-4.470E+02	%(P	1.252E+03 3.72E+02	G
Y-88		0.0000E+00					
			1836.01	0.000E+00	%(	7.737E-02 2.06E-02	G K
			898.02	-6.476E-03	% P	5.316E-02 1.49E-02	G
NB-94		-1.1512E-03					
			871.10	-1.151E-03	%(P	5.204E-02 1.44E-02	G K
			702.50	2.582E-02	& P	4.444E-02 1.37E-02	G K
Ag-108M		1.2888E-02					
			722.95	1.289E-02	%(	4.101E-02 1.20E-02	G K
			614.37	-2.346E-03	% P	4.671E-02 1.31E-02	G
			433.93	1.888E-03	&	4.563E-02 1.31E-02	G
CD-109		2.0276E-01					
			88.04	2.028E-01	&(P	1.180E+00 3.52E-01	G
SN-113		6.1715E-03					
			391.71	6.171E-03	&(	6.420E-02 1.86E-02	G K
			255.04	-3.973E-02	% P	1.852E+00 5.41E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	-2.5804E-02						
		427.95	-2.580E-02	&(P	1.411E-01	4.12E-02	G K
		600.77	2.521E-02	& P	2.247E-01	6.39E-02	G
		636.15	6.883E-02	& P	3.428E-01	9.84E-02	G
		463.51	2.435E-01	% P	3.327E-01	1.04E-01	G
		176.29	-1.098E-01	% P	6.569E-01	1.95E-01	G
I-131	-1.7840E-02						
		364.48	-1.784E-02	%(	6.285E-02	1.87E-02	G K
		636.97	0.000E+00	&	8.472E-01	2.38E-01	G
		284.29	1.346E-02	%	7.230E-01	2.09E-01	G
CS-134	-2.5103E-02						
		604.66	-2.510E-02	%(P	5.625E-02	1.69E-02	G K
		795.76	2.793E-02	% P	5.916E-02	1.79E-02	G
		569.29	4.795E-02	% P	2.002E-01	5.75E-02	G
		801.84	1.104E-01	%	5.093E-01	1.46E-01	G
CS-137	1.9709E-02						
		661.62	1.971E-02	&(P	5.121E-02	1.52E-02	G
CE-139	3.7938E-03						
		165.85	3.794E-03	&(P	4.779E-02	1.41E-02	G
EU-152	1.9533E-02						
		121.78	1.953E-02	&(P	1.367E-01	4.07E-02	G K
		344.30	-4.418E-02	% P	1.499E-01	4.45E-02	G
		1408.08	-1.987E-02	% P	2.800E-01	7.57E-02	G
		964.00	-6.055E-03	& P	5.813E-01	1.65E-01	G
		1112.07	-6.851E-02	% P	4.984E-01	1.42E-01	G
		778.90	-7.776E-02	% P	3.624E-01	1.04E-01	G
EU-154	-1.7594E-02						
		123.10	-1.759E-02	%(P	9.938E-02	2.96E-02	G K
		1274.80	-9.069E-03	% P	1.437E-01	3.87E-02	G
		723.30	-3.092E-03	& P	1.231E-01	3.06E-02	G
		1004.80	6.073E-02	& P	3.136E-01	8.98E-02	G
EU-155	3.8847E-02						
		86.45	3.885E-02	&(	1.330E-01	3.99E-02	G K
		105.31	2.495E-02	%	2.012E-01	5.99E-02	G
HG-203	-7.7717E-03						
		279.17	-7.772E-03	%(	4.167E-02	1.23E-02	G K
		72.87	-7.797E-02	% P	1.174E+00	3.50E-01	G
		70.83	2.422E-02	&	1.551E+00	4.58E-01	G
		82.50	-9.726E-01	%	2.455E+00	7.42E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	2.4947E-01						
		583.14	2.495E-01	*(P	5.661E-02	2.83E-02	G
		510.72	4.367E-01	+ P	2.101E-01	8.37E-02	G
PB-212	5.2635E-01						
		238.63	4.935E-01	(P	9.728E-02	3.74E-02	G K
							Energy duplication
		77.11	5.541E-01	(	3.227E-01	1.03E-01	G
		74.81	6.231E-01	?(P	6.602E-01	2.04E-01	G
PB-214	4.1493E-01						
		351.99	4.113E-01	(P	9.421E-02	3.92E-02	G K
		295.22	4.220E-01	*(P	1.773E-01	6.30E-02	G
							Energy duplication
		77.11	8.898E-01	+ P	5.293E-01	1.69E-01	G
		241.92	-1.750E-01	% P	6.206E-01	1.86E-01	G
BI-212	1.8284E-02						
		727.17	1.828E-02	%(P	5.206E-01	1.48E-01	G K
		1620.56	2.440E-01	&	1.851E+00	4.99E-01	G
		785.42	7.024E-01	% P	1.860E+00	5.51E-01	G
BI-214	4.1065E-01						
		609.32	4.107E-01	(P	9.489E-02	4.54E-02	G K
		1764.51	-8.968E-03	% P	4.657E-01	1.23E-01	G
		1120.28	7.629E-01	+ P	4.297E-01	1.83E-01	G
RA-224	8.9089E-01						
		241.00	8.909E-01	(P	1.145E+00	3.54E-01	G
RA-226	1.3024E+00						
		185.99	1.302E+00	(	1.120E+00	3.54E-01	G
AC-228	7.9219E-01						
		911.07	7.288E-01	(P	2.172E-01	1.04E-01	G K
		968.90	8.327E-01	@(P	3.302E-01	1.48E-01	G
		338.40	8.864E-01	@(P	3.430E-01	1.49E-01	G
TH-227	1.6171E-02						
		236.00	1.617E-02	&(P	3.234E-01	9.47E-02	G K
		256.25	-1.803E-02	& P	4.417E-01	1.27E-01	G
PA-234	-9.2541E-02						
		98.44	-9.254E-02	%(	1.583E-01	4.83E-02	G K
		946.00	6.664E-02	&	2.293E-01	6.67E-02	G
		131.28	2.044E-02	&	2.081E-01	6.19E-02	G
		94.67	-1.072E-01	%	2.746E-01	8.29E-02	G
		883.24	0.000E+00	&	4.635E-01	1.29E-01	G
		926.70	7.794E-03	%	3.807E-01	1.02E-01	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26 7.812E-02 %   2.928E-01 8.49E-02 G

TH-234       1.2690E+00
                           63.29 7.531E-01 %(P 2.117E+00 6.36E-01 G K
                           92.80 1.579E+00 *(P 1.630E+00 5.04E-01 G
                           92.38 1.690E+00 *(P 1.905E+00 5.86E-01 G

AM-241      -4.7655E-02
                           59.54-4.766E-02 &(P 3.027E-01 9.03E-02 G
   ( - This peak used in the nuclide activity average.

   * - Peak is too wide, but only one peak in library.
   ! - Peak is part of a multiplet and this area went
       negative during deconvolution.
   ? - Peak is too narrow.
   @ - Peak is too wide at FW25M, but ok at FWHM.
   % - Peak fails sensitivity test.
   $ - Peak identified, but first peak of this nuclide
       failed one or more qualification tests.
   + - Peak activity higher than counting uncertainty range.
   - - Peak activity lower than counting uncertainty range.
   = - Peak outside analysis energy range.
   & - Calculated peak centroid is not close enough to the
       library energy centroid for positive identification.
   P - Peakbackground subtraction
   } - Peak is too close to another for the activity
       to be found directly.

   Nuclide Codes:                      Peak Codes:
   T - Thermal Neutron Activation      G - Gamma Ray
   F - Fast Neutron Activation         X - X-Ray
   I - Fission Product                 P - Positron Decay
   N - Naturally Occurring Isotope     S - Single-Escape
   P - Photon Reaction                 D - Double-Escape
   C - Charged Particle Reaction       K - Key Line
   M - No MDA Calculation              A - Not in Average
   R - Coincidence Corrected           C - Coincidence Peak
   H - Halflife limit exceeded

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
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***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	-4.5400E-02	-4.7045E-02	3.4516E-01	3.4517E-01	3.855E-01
K-40		1.3584E+01	1.3584E+01	1.8075E+00	1.9637E+00	
MN-54	#A	4.6172E-03	4.6454E-03	3.7425E-02	3.7425E-02	4.454E-02
CO-57	#B	4.7784E-03	4.8121E-03	3.5990E-02	3.5991E-02	4.017E-02
CO-60	#B	-1.5412E-02	-1.5427E-02	6.1372E-02	6.1378E-02	6.914E-02

Sr-85	#A	-1.8091E-02	-1.8629E-02	4.9737E-02	4.9748E-02	5.394E-02
Kr-85	#A	-4.4697E+02	-4.4698E+02	1.2718E+03	1.2720E+03	1.252E+03
Y-88	#B	0.0000E+00	0.0000E+00	6.1891E-02	6.1891E-02	7.601E-02
NB-94	#B	-1.1512E-03	-1.1512E-03	6.5066E-02	6.5066E-02	5.204E-02
Ag-108M	#B	1.2887E-02	1.2888E-02	3.6042E-02	3.6050E-02	4.101E-02
CD-109	#A	2.0192E-01	2.0276E-01	1.0567E+00	1.0567E+00	1.175E+00
SN-113	#B	6.0704E-03	6.1715E-03	5.5890E-02	5.5892E-02	6.315E-02
SB-125	#B	-2.5756E-02	-2.5804E-02	1.3335E-01	1.3336E-01	1.408E-01
I-131	#B	-1.4084E-02	-1.7840E-02	5.6015E-02	5.6024E-02	4.962E-02
CS-134	#B	-2.5040E-02	-2.5103E-02	5.4018E-02	5.4036E-02	5.610E-02
CS-137	#A	1.9705E-02	1.9709E-02	4.5651E-02	4.5665E-02	5.120E-02
CE-139	#A	3.7418E-03	3.7938E-03	4.2426E-02	4.2427E-02	4.713E-02
EU-152	#B	1.9525E-02	1.9533E-02	1.2211E-01	1.2212E-01	1.366E-01
EU-154	#B	-1.7584E-02	-1.7594E-02	9.8040E-02	9.8045E-02	9.932E-02
EU-155	#B	3.8806E-02	3.8847E-02	1.1982E-01	1.1984E-01	1.329E-01
HG-203	#B	-7.4610E-03	-7.7717E-03	3.6795E-02	3.6798E-02	4.001E-02
TL-208	#	2.4947E-01	2.4947E-01	8.4904E-02	8.6066E-02	
PB-212	#	5.2635E-01	5.2635E-01	1.1971E-01	1.2335E-01	9.728E-02
PB-214	#	4.1493E-01	4.1493E-01	1.1030E-01	1.1277E-01	9.421E-02
BI-212	#B	1.8284E-02	1.8284E-02	4.4410E-01	4.4410E-01	5.206E-01
BI-214		4.1065E-01	4.1065E-01	1.3621E-01	1.3817E-01	
RA-224	#A	8.9089E-01	8.9089E-01	1.0608E+00	1.0620E+00	1.145E+00
RA-226	#	1.3024E+00	1.3024E+00	1.0630E+00	1.0655E+00	1.120E+00
AC-228		7.9219E-01	7.9219E-01	2.2453E-01	2.2895E-01	
TH-227	#B	1.6171E-02	1.6171E-02	2.8414E-01	2.8414E-01	3.234E-01
PA-234	#B	-9.2541E-02	-9.2541E-02	1.4484E-01	1.4493E-01	1.583E-01
TH-234	#B	1.2690E+00	1.2690E+00	1.2158E+00	1.2178E+00	2.117E+00
AM-241	#A	-4.7655E-02	-4.7655E-02	2.9866E-01	2.9867E-01	3.027E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (270.1 to 1999.1 keV) 1.5036026E+01 pCi/gm
Total Decayed Activity (270.1 to 1999.1 keV) 1.5036026E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
DAT

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 101F_27JUL2006_1449.An1

Sample description
FSS-OOL-05-06-014-F

Spectrum Filename: C:\GammaVision\Spectra\101F_27JUL2006_1449.An1

Acquisition information
Start time: 27-Jul-2006 14:49:31
Live time: 2000
Real time: 2002
Dead time: 0.08 %
Detector ID: 1

Detector system
Det 101- DSPE-633

Calibration
Filename: D1_1LSa.Clb
Detector 101 1.0 Liter Marinelli Sand

Energy Calibration
Created: 03-Sep-2004 08:50:48
Zero offset: 0.244 keV
Gain: 0.500 keV/channel
Quadratic: -2.493E-08 keV/channel^2

Efficiency Calibration
Created: 03-Sep-2004 08:52:26
Type: Polynomial
Uncertainty: 0.626 %
Coefficients: -0.321775 -5.816463 0.734234
-0.099357 0.006049 -0.000149

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.23keV)
Stop channel: 4000 (1999.11keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 1.6270E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.6270E+03) =
6.1463E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	24-Jul-2006 20:10:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	101_150K_28APR05.Pbc 01-May-2005 05:24:47
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 15 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.5723

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
74.39	149.	20.76	1.00	1.651E-02				
74.39	149.	20.76	1.00	1.651E-02	74.81	9.600	7.529E-01	PB212
77.39	291.	10.40	1.01	1.736E-02	77.11	10.700	1.296E+00	PB214
					77.11	17.500	8.029E-01	PB212
87.21	114.	35.12	1.50	1.910E-02	86.45	32.740	PBC<MDA	EU155
					88.04	3.790	PBC<MDA	CD109
93.10	112.	33.01	1.50	1.989E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
93.12	103.	34.95	1.50	1.985E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
129.21	79.	36.11	1.05	2.109E-02				
186.11	102.	30.26	1.18	1.858E-02	185.99	3.280	1.385E+00	RA226
209.08	54.	37.04	1.48	1.723E-02				
238.98	726.	4.26	1.12	1.556E-02	238.63	43.100	8.909E-01	PB212
241.87	82.	29.00	1.12	1.541E-02	241.00	3.900	1.121E+00	RA224
					241.92	7.470	PBC<MDA	PB214
295.41	166.	13.61	0.95	1.291E-02	295.22	19.200	5.505E-01	PB214
339.17	164.	13.23	1.47	1.132E-02	338.40	12.010	9.866E-01	AC228
352.17	257.	11.80	1.12	1.092E-02	351.99	37.100	5.234E-01	PB214
511.33	107.	17.16	1.19	7.582E-03	510.72	22.500	4.444E-01	TL208
583.85	222.	9.42	1.52	6.677E-03	583.14	86.000	3.169E-01	TL208
609.82	196.	10.63	1.28	6.408E-03	609.32	46.090	5.463E-01	BI214
728.19	55.	23.28	1.09	5.436E-03	727.17	11.800	7.077E-01	BI212
795.64	23.	40.21	1.50	5.016E-03	795.76	85.400	PBC<MDA	CS134
911.91	138.	12.68	1.48	4.443E-03	911.07	29.000	8.736E-01	AC228
970.11	58.	21.78	1.64	4.208E-03	968.90	17.460	6.424E-01	AC228
1121.17	59.	28.11	1.78	3.711E-03	1120.28	15.040	8.723E-01	BI214

1462.01	538.	4.40	1.81	2.940E-03	1460.75	10.700	1.414E+01	K40
1765.65	36.	18.28	2.11	2.481E-03	1764.51	15.920	7.603E-01	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
148.35	74.72	405.	149.	0.075	62.27	1.005	BI-207	D
154.35	77.72	313.	291.	0.146	31.21	1.007	PB-214	D
258.03	129.21	351.	79.	0.040	105.79	1.053	AC-228	sM
417.83	209.08	173.	54.	0.027	111.11	1.483	AC-228	sM
477.65	238.85	115.	726.	0.363	12.77	1.122	PB-212	D
483.45	241.75	242.	82.	0.041	86.99	1.124	PB-214	D

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.
M - Peak is close to a library peak.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-212	149.23	74.83	851.	184.	0.092	68.72	1.499
PB-214	153.79	77.11	738.	226.	0.113	53.74	1.499D
PB-212	153.79	77.11	734.	230.	0.115	53.74	1.499D
EU-155	174.00	87.21	746.	114.	0.057	105.37	1.499
TH-234	185.83	93.12	751.	103.	0.052	104.86	1.499s
TH-234	185.78	93.10	713.	112.	0.056	99.02	1.499s
RA-226	372.24	186.29	451.	99.	0.050	95.86	1.499s
PB-212	477.65	238.98	312.	595.	0.297	17.38	1.499
PB-214	590.94	295.60	147.	138.	0.069	44.54	1.499
AC-228	678.12	339.17	116.	162.	0.081	39.70	1.470s
PB-214	704.46	352.33	122.	224.	0.112	28.63	1.499
TL-208	1022.61	511.33	89.	91.	0.046	51.48	1.193s
TL-208	1167.71	583.85	72.	219.	0.110	28.27	1.518
BI-214	1219.67	609.82	69.	194.	0.097	31.89	1.285s
BI-212	1456.53	728.19	40.	55.	0.027	69.83	1.094s
CS-134	1591.51	795.64	32.	23.	0.011	120.62	1.502s
AC-228	1824.16	911.91	49.	136.	0.068	38.03	1.480s
AC-228	1940.64	970.11	39.	57.	0.028	65.35	1.639s
BI-214	2242.94	1121.17	54.	59.	0.029	84.32	1.781s
K-40	2925.05	1462.01	8.	536.	0.268	13.20	1.808
BI-214	3532.73	1765.65	3.	36.	0.018	54.84	2.113

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	Peak MDA Value pCi/gm	COMMENTS
BE-7		5.9392E-02					
			477.56	5.939E-02	%(	4.100E-01 1.19E-01	G
K-40		1.4138E+01					
			1460.75	1.414E+01	(P	4.209E-01 6.25E-01	G
MN-54		1.8100E-02					
			834.81	1.810E-02	%(P	5.529E-02 1.63E-02	G
CO-57		0.0000E+00					
			122.07	0.000E+00	%(	5.341E-02 1.58E-02	G K
			136.43	8.993E-02	&	3.597E-01 1.08E-01	G
CO-60		-1.1819E-02					
			1332.51	-1.182E-02	&(P	7.468E-02 2.12E-02	G K
			1173.23	1.073E-02	% P	7.339E-02 2.09E-02	G K
Sr-85		-1.3317E-02					
			514.00	-1.332E-02	%(	6.504E-02 1.92E-02	G
Kr-85		-3.2859E+02					
			513.99	-3.286E+02	%(P	1.464E+03 4.30E+02	G
Y-88		0.0000E+00					
			1836.01	0.000E+00	%(	5.900E-02 1.50E-02	G K
			898.02	-5.747E-03	% P	6.040E-02 1.70E-02	G
NB-94		2.6244E-04					
			871.10	2.624E-04	&(P	5.140E-02 1.41E-02	G K
			702.50	-7.976E-03	% P	5.252E-02 1.51E-02	G K
Ag-108M		-1.9238E-02					
			722.95	-1.924E-02	%(	6.467E-02 1.91E-02	G K
			614.37	-3.553E-02	% P	6.810E-02 2.07E-02	G
			433.93	-1.195E-02	%	5.336E-02 1.57E-02	G
CD-109		-1.3870E-01					
			88.04	-1.387E-01	%(P	1.637E+00 4.89E-01	G
SN-113		2.7509E-02					
			391.71	2.751E-02	&(	6.827E-02 2.05E-02	G K
			255.04	-3.571E-01	% P	2.180E+00 6.46E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	-1.0157E-03						
		427.95	-1.016E-03	&(P	1.509E-01	4.31E-02	G K
		600.77	-3.171E-02	% P	2.534E-01	7.25E-02	G
		636.15	-5.035E-03	% P	3.959E-01	1.10E-01	G
		463.51	2.433E-01	% P	4.451E-01	1.36E-01	G
		176.29	-8.194E-02	& P	7.227E-01	2.14E-01	G
I-131	-1.4548E-03						
		364.48	-1.455E-03	%(	4.896E-02	1.39E-02	G K
		636.97	-1.615E-01	%	8.711E-01	2.53E-01	G
		284.29	-2.136E-01	&	9.506E-01	2.83E-01	G
CS-134	1.3288E-02						
		604.66	-1.355E-02	%(P	5.573E-02	1.63E-02	G K
		795.76	4.396E-02	(P	5.633E-02	1.80E-02	G
		569.29	1.089E-01	& P	2.735E-01	8.18E-02	G
		801.84	1.353E-01	%	5.566E-01	1.61E-01	G
CS-137	-1.9564E-02						
		661.62	-1.956E-02	%(P	6.174E-02	1.81E-02	G
CE-139	1.8509E-02						
		165.85	1.851E-02	%(P	5.313E-02	1.60E-02	G
EU-152	-2.6245E-02						
		121.78	-2.624E-02	%(P	1.548E-01	4.62E-02	G K
		344.30	-4.137E-02	% P	1.737E-01	5.14E-02	G
		1408.08	-2.291E-03	% P	2.116E-01	5.31E-02	G
		964.00	1.724E-04	& P	4.114E-01	1.13E-01	G
		1112.07	1.217E-02	% P	5.045E-01	1.40E-01	G
		778.90	1.577E-01	% P	3.674E-01	1.10E-01	G
EU-154	-1.6590E-02						
		123.10	-1.659E-02	%(P	1.052E-01	3.13E-02	G K
		1274.80	-1.377E-02	% P	2.072E-01	5.79E-02	G
		723.30	-1.061E-01	% P	3.215E-01	9.53E-02	G
		1004.80	-4.560E-02	& P	3.533E-01	1.00E-01	G
EU-155	1.5171E-01						
		86.45	1.517E-01	(	1.728E-01	5.33E-02	G K
		105.31	-5.822E-02	%	2.223E-01	6.68E-02	G
HG-203	2.0133E-02						
		279.17	2.013E-02	%(	4.661E-02	1.41E-02	G K
		72.87	-6.185E-01	& P	1.361E+00	4.12E-01	G
		70.83	-5.307E-02	%	2.367E+00	7.05E-01	G
		82.50	-2.288E-01	%	2.731E+00	8.14E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	3.1689E-01						
		583.14	3.169E-01	(P	6.092E-02	3.02E-02	G
		510.72	4.444E-01	+ P	2.265E-01	8.97E-02	G
PB-212	7.3570E-01						
		238.63	7.357E-01	(P	1.051E-01	4.31E-02	G K
							Energy duplication
		77.11	6.345E-01	-	3.558E-01	1.14E-01	G
		74.81	9.626E-01	& P	7.251E-01	2.27E-01	G
PB-214	4.6002E-01						
		351.99	4.590E-01	(P	1.108E-01	4.42E-02	G K
		295.22	4.620E-01	(P	1.984E-01	6.95E-02	G
							Energy duplication
		77.11	1.021E+00	+ P	5.833E-01	1.86E-01	G
		241.92	-4.088E-02	% P	7.177E-01	2.12E-01	G
BI-212	7.0767E-01						
		727.17	7.077E-01	@(P	4.175E-01	1.67E-01	G K
		1620.56	-2.086E-02	%	1.922E+00	4.93E-01	G
		785.42	1.046E+00	% P	2.252E+00	6.81E-01	G
BI-214	5.4628E-01						
		609.32	5.463E-01	@(P	1.161E-01	5.84E-02	G K
		1764.51	7.603E-01	+ P	2.220E-01	1.41E-01	G
		1120.28	8.723E-01	+ P	5.517E-01	2.47E-01	G
RA-224	2.2242E-01						
		241.00	2.224E-01	%(P	5.434E-01	1.63E-01	G
RA-226	1.3497E+00						
		185.99	1.350E+00	*(	1.386E+00	4.31E-01	G
AC-228	9.0672E-01						
		911.07	8.736E-01	@(P	2.284E-01	1.12E-01	G K
		968.90	6.424E-01	- P	3.598E-01	1.42E-01	G
		338.40	9.866E-01	@(P	3.224E-01	1.33E-01	G
TH-227	-2.9385E-01						
		236.00	-2.939E-01	%(P	5.356E-01	1.63E-01	G K
		256.25	2.076E-01	& P	5.747E-01	1.72E-01	G
PA-234	-3.7701E-02						
		98.44	-3.770E-02	%(	1.861E-01	5.57E-02	G K
		946.00	-2.880E-02	&	3.364E-01	9.56E-02	G
		131.28	-1.987E-02	%	2.229E-01	6.63E-02	G
		94.67	-8.434E-02	%	3.206E-01	9.63E-02	G
		883.24	6.991E-02	%	2.780E-01	7.89E-02	G
		926.70	1.270E-01	&	4.336E-01	1.26E-01	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26 1.664E-01 &   4.030E-01 1.21E-01 G

TH-234       1.1747E+00
                           63.29 5.389E-01 %(P 2.460E+00 7.36E-01 G K
                           92.80 1.565E+00 *(P 1.770E+00 5.45E-01 G
                           92.38 1.684E+00 &(P 2.124E+00 6.50E-01 G

AM-241       4.2833E-02
                           59.54 4.283E-02 %(P 2.919E-01 8.70E-02 G
   ( - This peak used in the nuclide activity average.

   * - Peak is too wide, but only one peak in library.
   ! - Peak is part of a multiplet and this area went
       negative during deconvolution.
   ? - Peak is too narrow.
   @ - Peak is too wide at FW25M, but ok at FWHM.
   % - Peak fails sensitivity test.
   $ - Peak identified, but first peak of this nuclide
       failed one or more qualification tests.
   + - Peak activity higher than counting uncertainty range.
   - - Peak activity lower than counting uncertainty range.
   = - Peak outside analysis energy range.
   & - Calculated peak centroid is not close enough to the
       library energy centroid for positive identification.
   P - Peakbackground subtraction
   } - Peak is too close to another for the activity
       to be found directly.

   Nuclide Codes:                      Peak Codes:
   T - Thermal Neutron Activation      G - Gamma Ray
   F - Fast Neutron Activation         X - X-Ray
   I - Fission Product                 P - Positron Decay
   N - Naturally Occurring Isotope     S - Single-Escape
   P - Photon Reaction                 D - Double-Escape
   C - Charged Particle Reaction       K - Key Line
   M - No MDA Calculation              A - Not in Average
   R - Coincidence Corrected           C - Coincidence Peak
   H - Halflife limit exceeded

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
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***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	5.7289E-02	5.9392E-02	3.5565E-01	3.5566E-01	3.955E-01
K-40		1.4138E+01	1.4138E+01	1.8742E+00	2.0374E+00	
MN-54	#A	1.7988E-02	1.8100E-02	4.8909E-02	4.8919E-02	5.495E-02
CO-57	#B	0.0000E+00	0.0000E+00	4.7483E-02	4.7483E-02	5.303E-02
CO-60	#B	-1.1807E-02	-1.1819E-02	6.6126E-02	6.6130E-02	7.460E-02

Sr-85	#A	-1.2927E-02	-1.3317E-02	5.7595E-02	5.7600E-02	6.314E-02
Kr-85	#A	-3.2858E+02	-3.2859E+02	1.5513E+03	1.5514E+03	1.464E+03
Y-88	#B	0.0000E+00	0.0000E+00	4.4931E-02	4.4931E-02	5.794E-02
NB-94	#B	2.6244E-04	2.6244E-04	4.2369E-02	4.2369E-02	5.140E-02
Ag-108M	#B	-1.9237E-02	-1.9238E-02	5.7329E-02	5.7340E-02	6.467E-02
CD-109	#A	-1.3811E-01	-1.3870E-01	1.5841E+00	1.5841E+00	1.630E+00
SN-113	#B	2.7053E-02	2.7509E-02	6.1602E-02	6.1622E-02	6.713E-02
SB-125	#B	-1.0138E-03	-1.0157E-03	8.4365E-02	8.4365E-02	1.506E-01
I-131	#B	-1.1450E-03	-1.4548E-03	4.1730E-02	4.1731E-02	3.853E-02
CS-134	#B	1.3254E-02	1.3288E-02	1.6325E-02	1.6342E-02	5.559E-02
CS-137	#A	-1.9560E-02	-1.9564E-02	6.3020E-02	6.3030E-02	6.173E-02
CE-139	#A	1.8252E-02	1.8509E-02	4.7982E-02	4.7993E-02	5.239E-02
EU-152	#B	-2.6234E-02	-2.6245E-02	1.5021E-01	1.5022E-01	1.547E-01
EU-154	#B	-1.6580E-02	-1.6590E-02	1.0460E-01	1.0460E-01	1.051E-01
EU-155	#A	1.5155E-01	1.5171E-01	1.5985E-01	1.6008E-01	1.726E-01
HG-203	#B	1.9318E-02	2.0133E-02	4.2216E-02	4.2231E-02	4.472E-02
TL-208		3.1689E-01	3.1689E-01	9.0561E-02	9.2315E-02	
PB-212	#	7.3570E-01	7.3570E-01	1.2921E-01	1.3573E-01	1.051E-01
PB-214	#	4.6002E-01	4.6002E-01	1.2321E-01	1.2592E-01	1.108E-01
BI-212	#	7.0767E-01	7.0767E-01	5.0027E-01	5.0187E-01	
BI-214		5.4628E-01	5.4628E-01	1.7518E-01	1.7787E-01	
RA-224	A	2.2242E-01	2.2242E-01	4.8851E-01	4.8867E-01	5.434E-01
RA-226	#A	1.3497E+00	1.3497E+00	1.2938E+00	1.2960E+00	1.386E+00
AC-228	#	9.0672E-01	9.0672E-01	2.5263E-01	2.5777E-01	
TH-227	#B	-2.9385E-01	-2.9385E-01	4.9551E-01	4.9579E-01	5.356E-01
PA-234	#B	-3.7701E-02	-3.7701E-02	1.6705E-01	1.6706E-01	1.861E-01
TH-234	#B	1.1747E+00	1.1747E+00	1.2270E+00	1.2288E+00	2.460E+00
AM-241	#A	4.2832E-02	4.2833E-02	2.6104E-01	2.6105E-01	2.919E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (295.1 to 1999.1 keV) 1.6615486E+01 pCi/gm
Total Decayed Activity (295.1 to 1999.1 keV) 1.6615486E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
DAT

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 102F_26JUL2006_1907.An1

Sample description
FSS-OOL-05-06-004-F

Spectrum Filename: C:\GammaVision\Spectra\102F_26JUL2006_1907.An1

Acquisition information
Start time: 26-Jul-2006 19:07:46
Live time: 2000
Real time: 2020
Dead time: 0.99 %
Detector ID: 3

Detector system
Det 102 - DSPP-468

Calibration
Filename: D2_1LSa.Clb
DET 102 1 Liter Sand Geometry

Energy Calibration
Created: 15-Jan-2005 03:09:29
Zero offset: 0.220 keV
Gain: 0.500 keV/channel
Quadratic: -6.435E-08 keV/channel^2

Efficiency Calibration
Created: 15-Jan-2005 06:48:10
Type: Polynomial
Uncertainty: 0.497 %
Coefficients: -0.294180 -5.980622 0.744607
-0.096737 0.005214 -0.000120

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.22keV)
Stop channel: 4000 (1999.02keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 2.0370E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 2.0370E+03) =
4.9092E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	24-Jul-2006 21:07:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	102_150K_28APR05.Pbc 01-May-2005 05:27:47
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 14 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.7483

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
77.21	157.	28.96	1.50	9.541E-03	77.11	10.700	1.020E+00	PB214
					77.11	17.500	6.236E-01	PB212
77.21	157.	28.96	1.50	9.541E-03	77.11	10.700	1.020E+00	PB214
					77.11	17.500	6.236E-01	PB212
186.31	80.	36.33	1.50	1.627E-02	185.99	3.280	PBC<MDA	RA226
209.80	73.	34.27	0.94	1.517E-02				
239.12	647.	4.61	1.22	1.378E-02	238.63	43.100	7.212E-01	PB212
242.23	97.	21.55	1.22	1.364E-02	241.00	3.900	PBC<MDA	RA224
					241.92	7.470	6.310E-01	PB214
295.80	127.	14.18	1.26	1.144E-02	295.22	19.200	3.831E-01	PB214
300.95	42.	35.16	1.26	1.126E-02				
339.18	130.	19.08	1.29	1.004E-02	338.40	12.010	7.116E-01	AC228
352.68	255.	12.46	1.26	9.660E-03	351.99	37.100	4.708E-01	PB214
409.90	42.	41.36	1.55	8.321E-03				
463.61	58.	28.77	1.78	7.363E-03	463.51	10.000	5.092E-01	SB125
511.67	89.	19.92	1.74	6.683E-03	510.72	22.500	3.924E-01	TL208
584.38	219.	9.16	1.33	5.878E-03	583.14	86.000	2.860E-01	TL208
610.49	176.	10.85	1.52	5.639E-03	609.32	46.090	4.487E-01	BI214
728.03	53.	25.06	0.89	4.789E-03	727.17	11.800	6.227E-01	BI212
796.72	29.	34.54	1.60	4.420E-03	795.76	85.400	PBC<MDA	CS134
912.90	98.	18.72	1.64	3.915E-03				
970.02	101.	14.03	1.50	3.714E-03				
1463.44	578.	4.21	2.08	2.617E-03	1460.75	10.700	1.368E+01	K40

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

Peak Centroid	Background	Net Area	Intensity	Uncert	FWHM	Suspected

Channel	Energy	Counts	Counts	Cts/Sec	3 Sigma %	keV	Nuclide	
419.21	209.80	248.	73.	0.036	102.82	0.941	NP-239	M
477.87	239.08	121.	647.	0.323	13.83	1.215	PB-212	D

Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM	Suspected	
484.09	242.18	170.	97.	0.049	64.65	1.217	PB-214	D
601.60	300.97	91.	41.	0.021	106.73	0.977	PB-212	M
819.52	409.90	95.	42.	0.021	124.07	1.549	AC-228	
1825.94	912.90	63.	100.	0.050	44.97	1.638	AC-228	M
1940.25	970.02	25.	103.	0.051	36.16	1.504	AC-228	sM

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.
M - Peak is close to a library peak.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-214	153.80	77.11	955.	157.	0.078	86.88	1.500D
PB-212	153.80	77.11	955.	157.	0.078	86.88	1.500D
RA-226	372.24	186.31	438.	80.	0.040	109.00	1.500
PB-212	477.88	239.13	417.	532.	0.266	20.85	1.500
PB-214	591.29	295.82	177.	137.	0.069	48.54	1.500s
AC-228	677.80	339.06	123.	118.	0.059	48.52	1.500
PB-214	704.99	352.65	139.	221.	0.111	30.25	1.500
SB-125	927.61	463.93	70.	43.	0.021	91.37	1.500s
TL-208	1023.13	511.67	78.	89.	0.045	59.76	1.743s
TL-208	1168.59	584.38	58.	218.	0.109	27.49	1.331
BI-214	1220.83	610.49	61.	176.	0.088	32.54	1.519
BI-212	1456.02	728.03	46.	53.	0.027	75.17	0.885s
CS-134	1593.46	796.72	36.	29.	0.015	103.63	1.601s
K-40	2927.83	1463.46	6.	573.	0.286	12.67	2.042

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	Peak MDA Value pCi/gm	COMMENTS
BE-7		1.2842E-01					
			477.56	1.284E-01	%(	3.208E-01 9.61E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
K-40	1.3554E+01						
		1460.75	1.355E+01	(P	3.402E-01	5.72E-01	G
MN-54	-9.9142E-03						
		834.81	-9.914E-03	&(P	5.837E-02	1.68E-02	G
CO-57	4.0657E-03						
		122.07	4.066E-03	%(	5.669E-02	1.69E-02	G K
		136.43	9.354E-02	%	3.962E-01	1.19E-01	G
CO-60	3.8936E-03						
		1332.51	3.894E-03	%(P	5.313E-02	1.45E-02	G K
		1173.23	8.999E-03	&	7.164E-02	2.05E-02	G K
Sr-85	-1.2607E-02						
		514.00	-1.261E-02	%(	5.568E-02	1.65E-02	G
Kr-85	-2.8505E+02						
		513.99	-2.850E+02	%(	1.259E+03	3.72E+02	G
Y-88	-2.0653E-05						
		1836.01	-2.065E-05	%(P	5.296E-02	1.35E-02	G K
		898.02	-6.607E-03	% P	5.285E-02	1.48E-02	G
NB-94	-7.1010E-03						
		871.10	-7.101E-03	&(	4.887E-02	1.39E-02	G K
		702.50	5.473E-03	%	4.457E-02	1.27E-02	G K
Ag-108M	-8.9831E-03						
		722.95	-8.983E-03	%(	6.247E-02	1.81E-02	G K
		614.37	-5.386E-02	% P	7.937E-02	2.45E-02	G
		433.93	7.573E-03	&	4.066E-02	1.19E-02	G
CD-109	8.4412E-01						
		88.04	8.441E-01	%(P	1.961E+00	5.93E-01	G
SN-113	-7.4420E-03						
		391.71	-7.442E-03	&(	6.417E-02	1.87E-02	G K
		255.04	-3.308E-01	%	1.860E+00	5.52E-01	G
SB-125	1.2199E-01						
		427.95	3.298E-02	%(P	1.113E-01	3.28E-02	G K
		600.77	4.568E-03	% P	2.219E-01	6.23E-02	G
		636.15	-3.879E-03	& P	3.906E-01	1.10E-01	G
		463.51	3.854E-01	@(P	3.770E-01	1.22E-01	G
		176.29	-1.090E-01	% P	6.701E-01	1.99E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
I-131	-1.0966E-03						
		364.48	-1.097E-03	&(	5.791E-02	1.68E-02	G K
		636.97	5.933E-02	&	7.081E-01	2.02E-01	G
		284.29	-3.475E-02	%	7.836E-01	2.30E-01	G
CS-134	1.9680E-02						
		604.66	-7.971E-03	&(	4.530E-02	1.31E-02	G K
		795.76	5.128E-02	(	5.403E-02	1.77E-02	G
		569.29	-1.332E-02	%	3.066E-01	8.77E-02	G
		801.84	-2.259E-02	& P	5.436E-01	1.52E-01	G
CS-137	-8.1463E-03						
		661.62	-8.146E-03	&(	5.668E-02	1.63E-02	G
CE-139	-1.9238E-02						
		165.85	-1.924E-02	%(P	5.496E-02	1.66E-02	G
EU-152	2.1084E-03						
		121.78	2.108E-03	&(P	1.663E-01	4.94E-02	G K
		344.30	-2.099E-02	%	1.459E-01	4.29E-02	G
		1408.08	7.942E-02	&	1.657E-01	5.08E-02	G
		964.00	-2.804E-03	% P	4.914E-01	1.39E-01	G
		1112.07	4.907E-02	%	4.638E-01	1.31E-01	G
		778.90	-8.555E-04	% P	4.827E-01	1.37E-01	G
EU-154	-1.0469E-02						
		123.10	-1.047E-02	&(P	8.629E-02	2.56E-02	G K
		1274.80	3.522E-03	%	1.914E-01	5.31E-02	G
		723.30	-2.584E-02	% P	2.950E-01	8.47E-02	G
		1004.80	-7.030E-02	%	3.209E-01	9.28E-02	G
EU-155	2.4361E-02						
		86.45	2.436E-02	%(P	2.390E-01	7.13E-02	G K
		105.31	1.124E-01	%	2.345E-01	7.11E-02	G
HG-203	1.8305E-03						
		279.17	1.830E-03	&(P	4.935E-02	1.44E-02	G K
		72.87	-2.689E-01	&	1.963E+00	5.88E-01	G
		70.83	-3.585E-01	%	3.805E+00	1.14E+00	G
		82.50	-1.361E+00	%	4.106E+00	1.24E+00	G
TL-208	2.8603E-01						
		583.14	2.860E-01	(P	4.987E-02	2.63E-02	G
		510.72	3.924E-01	+	1.931E-01	7.83E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
PB-212	6.0197E-01						
		238.63	5.932E-01	(	1.092E-01	4.12E-02	G K
							Energy duplication
		77.11	6.236E-01	@(	5.828E-01	1.81E-01	G
		74.81	6.968E-01	& P	1.188E+00	3.61E-01	G
PB-214	4.1036E-01						
		351.99	4.090E-01	(P	1.067E-01	4.13E-02	G K
		295.22	4.131E-01	(	1.952E-01	6.68E-02	G
							Energy duplication
		77.11	1.020E+00	+	9.532E-01	2.95E-01	G
		241.92	4.115E-01	%	6.710E-01	2.05E-01	G
BI-212	6.2271E-01						
		727.17	6.227E-01	@(	4.020E-01	1.56E-01	G K
		1620.56	-3.237E-01	% P	2.059E+00	5.62E-01	G
		785.42	9.199E-01	% P	2.575E+00	7.66E-01	G
BI-214	4.4868E-01						
		609.32	4.487E-01	(	9.956E-02	4.88E-02	G K
		1764.51	-1.623E-03	& P	1.380E-01	1.87E-02	G
		1120.28	-1.369E-02	&	4.917E-01	1.39E-01	G
RA-224	8.6497E-01						
		241.00	8.650E-01	&(P	1.271E+00	3.89E-01	G
RA-226	1.0007E+00						
		185.99	1.001E+00	(P	1.247E+00	3.84E-01	G
AC-228	1.8019E-01						
		911.07	-1.326E-02	%(P	2.381E-01	6.79E-02	G K
		968.90	-1.796E-02	% P	3.531E-01	9.96E-02	G
		338.40	6.473E-01	(	2.985E-01	1.05E-01	G
TH-227	-1.4715E-01						
		236.00	-1.471E-01	%(P	4.198E-01	1.26E-01	G K
		256.25	-1.054E-01	%	5.415E-01	1.61E-01	G
PA-234	-8.2722E-02						
		98.44	-8.272E-02	%(	2.314E-01	6.98E-02	G K
		946.00	7.392E-04	&	2.434E-01	6.67E-02	G
		131.28	-2.607E-04	%	2.231E-01	6.61E-02	G
		94.67	-4.025E-02	%	4.342E-01	1.30E-01	G
		883.24	0.000E+00	%	4.714E-01	1.32E-01	G
		926.70	1.194E-01	&	4.234E-01	1.23E-01	G
		569.26	-2.527E-02	&	4.563E-01	1.31E-01	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments

TH-234       4.3765E-02
                           63.29 4.376E-02 &(P 3.952E+00 1.17E+00 G K
                           92.80 1.028E+00 &   2.343E+00 7.10E-01 G
                           92.38-1.473E-01 & P 2.715E+00 8.09E-01 G

AM-241      -2.6904E-01
                           59.54-2.690E-01 %(  6.003E-01 1.82E-01 G
   ( - This peak used in the nuclide activity average.

   * - Peak is too wide, but only one peak in library.
   ! - Peak is part of a multiplet and this area went
       negative during deconvolution.
   ? - Peak is too narrow.
   @ - Peak is too wide at FW25M, but ok at FWHM.
   % - Peak fails sensitivity test.
   $ - Peak identified, but first peak of this nuclide
       failed one or more qualification tests.
   + - Peak activity higher than counting uncertainty range.
   - - Peak activity lower than counting uncertainty range.
   = - Peak outside analysis energy range.
   & - Calculated peak centroid is not close enough to the
       library energy centroid for positive identification.
   P - Peakbackground subtraction
   } - Peak is too close to another for the activity
       to be found directly.

   Nuclide Codes:                      Peak Codes:
   T - Thermal Neutron Activation      G - Gamma Ray
   F - Fast Neutron Activation         X - X-Ray
   I - Fission Product                 P - Positron Decay
   N - Naturally Occurring Isotope     S - Single-Escape
   P - Photon Reaction                 D - Double-Escape
   C - Charged Particle Reaction       K - Key Line
   M - No MDA Calculation              A - Not in Average
   R - Coincidence Corrected           C - Coincidence Peak
   H - Halflife limit exceeded

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
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***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	1.2526E-01	1.2842E-01	2.8842E-01	2.8851E-01	3.129E-01
K-40		1.3554E+01	1.3554E+01	1.7170E+00	1.8780E+00	3.402E-01
MN-54	#A	-9.8721E-03	-9.9142E-03	5.4065E-02	5.4068E-02	5.812E-02
CO-57	#B	4.0457E-03	4.0657E-03	5.0642E-02	5.0643E-02	5.642E-02
CO-60	#B	3.8909E-03	3.8936E-03	4.3502E-02	4.3503E-02	5.310E-02
Sr-85	#A	-1.2352E-02	-1.2607E-02	4.9358E-02	4.9363E-02	5.455E-02

Kr-85	#A	-2.8505E+02	-2.8505E+02	1.1163E+03	1.1164E+03	1.259E+03
Y-88	#B	-2.0397E-05	-2.0653E-05	5.3075E-04	5.3075E-04	5.230E-02
NB-94	#B	-7.1010E-03	-7.1010E-03	4.1741E-02	4.1743E-02	4.887E-02
Ag-108M	#B	-8.9828E-03	-8.9831E-03	5.4266E-02	5.4268E-02	6.247E-02
CD-109	#A	8.4165E-01	8.4412E-01	1.7804E+00	1.7811E+00	1.956E+00
SN-113	#B	-7.3566E-03	-7.4420E-03	5.6180E-02	5.6182E-02	6.343E-02
SB-125	#F	1.2183E-01	1.2199E-01	1.1550E-01	1.1570E-01	1.112E-01
I-131	#B	-9.2955E-04	-1.0966E-03	5.0287E-02	5.0287E-02	4.909E-02
CS-134	#B	1.9645E-02	1.9680E-02	2.0394E-02	2.0424E-02	4.522E-02
CS-137	#A	-8.1453E-03	-8.1463E-03	4.9036E-02	4.9039E-02	5.667E-02
CE-139	#A	-1.9053E-02	-1.9238E-02	5.0780E-02	5.0792E-02	5.443E-02
EU-152	#B	2.1078E-03	2.1084E-03	1.4809E-01	1.4809E-01	1.662E-01
EU-154	#B	-1.0464E-02	-1.0469E-02	7.9709E-02	7.9711E-02	8.625E-02
EU-155	#B	2.4343E-02	2.4361E-02	2.1405E-01	2.1405E-01	2.388E-01
HG-203	#B	1.7790E-03	1.8305E-03	4.3350E-02	4.3350E-02	4.797E-02
TL-208		2.8603E-01	2.8603E-01	7.8761E-02	8.0380E-02	
PB-212	#	6.0197E-01	6.0197E-01	1.2549E-01	1.2996E-01	1.092E-01
PB-214	#	4.1036E-01	4.1036E-01	1.1740E-01	1.1964E-01	1.067E-01
BI-212	#	6.2271E-01	6.2271E-01	4.6810E-01	4.6940E-01	
BI-214		4.4868E-01	4.4868E-01	1.4601E-01	1.4816E-01	
RA-224	#A	8.6497E-01	8.6497E-01	1.1682E+00	1.1692E+00	1.271E+00
RA-226	#A	1.0007E+00	1.0007E+00	1.1512E+00	1.1526E+00	1.247E+00
AC-228	B	1.8019E-01	1.8019E-01	8.7434E-02	8.8017E-02	2.381E-01
TH-227	#B	-1.4715E-01	-1.4715E-01	3.8536E-01	3.8545E-01	4.198E-01
PA-234	#B	-8.2722E-02	-8.2722E-02	2.0946E-01	2.0951E-01	2.314E-01
TH-234	#B	4.3765E-02	4.3765E-02	3.5129E+00	3.5129E+00	3.952E+00
AM-241	#A	-2.6904E-01	-2.6904E-01	5.4536E-01	5.4557E-01	6.003E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (295.7 to 1999.0 keV) 1.5091324E+01 pCi/gm
Total Decayed Activity (295.7 to 1999.0 keV) 1.5091324E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
DAT

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 102F_26JUL2006_1944.An1

Sample description
FSS-OOL-05-06-002-F

Spectrum Filename: C:\GammaVision\Spectra\102F_26JUL2006_1944.An1

Acquisition information
Start time: 26-Jul-2006 19:44:55
Live time: 2000
Real time: 2021
Dead time: 1.02 %
Detector ID: 3

Detector system
Det 102 - DSPP-468

Calibration
Filename: D2_1LSa.Clb
DET 102 1 Liter Sand Geometry

Energy Calibration
Created: 15-Jan-2005 03:09:29
Zero offset: 0.220 keV
Gain: 0.500 keV/channel
Quadratic: -6.435E-08 keV/channel^2

Efficiency Calibration
Created: 15-Jan-2005 06:48:10
Type: Polynomial
Uncertainty: 0.497 %
Coefficients: -0.294180 -5.980622 0.744607
-0.096737 0.005214 -0.000120

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.22keV)
Stop channel: 4000 (1999.02keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 2.0360E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 2.0360E+03) =
4.9116E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	24-Jul-2006 20:20:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	102_150K_28APR05.Pbc 01-May-2005 05:27:47
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 12 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.6892

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
74.93	119.	37.92	1.50	8.847E-03	74.81	9.600	PBC<MDA	PB212
77.19	190.	23.85	1.50	9.541E-03	77.11	10.700	1.235E+00	PB214
					77.11	17.500	7.550E-01	PB212
77.19	190.	23.85	1.50	9.541E-03	77.11	10.700	1.235E+00	PB214
					77.11	17.500	7.550E-01	PB212
129.38	112.	37.63	0.62	1.716E-02				
129.38	112.	37.63	0.62	1.716E-02	131.28	20.000	2.162E-01	PA234
186.29	104.	28.42	1.80	1.625E-02	185.99	3.280	PBC<MDA	RA226
209.34	82.	32.15	1.06	1.519E-02				
239.29	788.	5.63	1.16	1.377E-02	238.63	43.100	8.789E-01	PB212
270.71	96.	31.55	1.55	1.241E-02				
295.88	118.	15.15	1.26	1.144E-02	295.22	19.200	3.559E-01	PB214
300.66	50.	29.39	1.26	1.127E-02				
328.21	57.	26.55	1.47	1.036E-02				
339.19	164.	14.42	1.14	1.004E-02	338.40	12.010	8.987E-01	AC228
352.65	236.	11.38	1.00	9.661E-03	351.99	37.100	4.364E-01	PB214
512.12	126.	17.32	1.26	6.677E-03	510.72	22.500	5.552E-01	TL208
584.39	209.	9.04	1.24	5.878E-03	583.14	86.000	2.728E-01	TL208
610.20	163.	12.26	1.28	5.642E-03	609.32	46.090	4.147E-01	BI214
728.39	53.	21.10	1.48	4.787E-03	727.17	11.800	6.172E-01	BI212
912.92	130.	12.84	1.73	3.915E-03				
966.01	27.	30.50	1.72	3.727E-03				
970.85	79.	14.03	1.72	3.711E-03				
1122.16	36.	29.56	1.82	3.283E-03	1120.28	15.040	4.865E-01	BI214
1463.44	549.	4.37	1.97	2.617E-03				

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
258.34	129.38	619.	112.	0.056	112.90	0.616	AC-228	l
418.31	209.34	265.	82.	0.041	96.46	1.058	AC-228	M
541.05	270.71	267.	96.	0.048	94.65	1.547	AC-228	sM
600.97	300.60	85.	50.	0.025	88.16	1.258	PB-212	lD

Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM	Suspected	
656.09	328.21	86.	57.	0.029	79.65	1.471	AC-228	M
1825.98	912.92	42.	130.	0.065	33.62	1.731	AC-228	M
1932.22	966.11	19.	27.	0.013	91.50	1.716	TB-160	D
1941.91	970.96	21.	79.	0.039	42.09	1.719	J-135	D
2927.78	1463.44	5.	550.	0.275	12.91	1.971	K-40	M

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.
M - Peak is close to a library peak.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-212	149.44	74.93	1017.	119.	0.060	113.76	1.500s
PB-214	153.80	77.11	931.	190.	0.095	71.55	1.500D
PB-212	153.80	77.11	931.	190.	0.095	71.55	1.500D
RA-226	371.90	186.14	445.	90.	0.045	99.04	1.500s
PB-212	477.91	239.14	434.	615.	0.308	18.78	1.500
PB-214	591.35	295.85	191.	120.	0.060	56.10	1.500
AC-228	677.66	338.99	113.	150.	0.075	38.69	1.500
PB-214	705.02	352.67	119.	217.	0.109	29.38	1.500
TL-208	1024.02	512.12	100.	126.	0.063	51.95	1.259s
TL-208	1168.61	584.39	55.	208.	0.104	27.12	1.241
BI-214	1220.24	610.20	71.	163.	0.081	36.78	1.280
BI-212	1456.75	728.39	29.	53.	0.026	63.30	1.477s
BI-214	2244.73	1122.16	39.	36.	0.018	88.68	1.819s

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	Peak MDA Value pCi/gm	COMMENTS
BE-7		-3.2100E-02					
			477.56	-3.210E-02	%(	4.162E-01 1.20E-01	G
K-40		-3.7905E-02					
			1460.75	-3.791E-02	%(P	8.586E-01 2.42E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
MN-54	3.9868E-03						
		834.81	3.987E-03	%(P	4.970E-02	1.40E-02	G
CO-57	8.8766E-03						
		122.07	8.877E-03	%(	5.448E-02	1.63E-02	G K
		136.43	3.607E-02	%	4.522E-01	1.35E-01	G
CO-60	-3.0832E-04						
		1332.51	-3.083E-04	%(P	4.476E-02	1.16E-02	G K
		1173.23	-7.581E-03	&	6.341E-02	1.80E-02	G K
Sr-85	-9.2666E-03						
		514.00	-9.267E-03	&(	5.475E-02	1.61E-02	G
Kr-85	-2.0814E+02						
		513.99	-2.081E+02	&(	1.182E+03	3.47E+02	G
Y-88	-8.2549E-04						
		1836.01	-8.255E-04	&(P	6.032E-02	1.58E-02	G K
		898.02	6.207E-03	% P	5.713E-02	1.61E-02	G
NB-94	0.0000E+00						
		871.10	0.000E+00	%(	6.083E-02	1.71E-02	G K
		702.50	-2.523E-04	%	4.343E-02	1.21E-02	G K
Ag-108M	-3.5377E-03						
		722.95	-3.538E-03	%(	5.117E-02	1.45E-02	G K
		614.37	-3.198E-02	% P	6.982E-02	2.11E-02	G
		433.93	-2.990E-03	&	4.171E-02	1.20E-02	G
CD-109	-3.6268E-02						
		88.04	-3.627E-02	%(P	2.314E+00	6.90E-01	G
SN-113	2.0527E-04						
		391.71	2.053E-04	%(	6.655E-02	1.92E-02	G K
		255.04	-5.434E-01	%	2.007E+00	6.00E-01	G
SB-125	-1.6056E-02						
		427.95	-1.606E-02	%(P	1.279E-01	3.68E-02	G K
		600.77	-3.259E-02	% P	2.403E-01	6.91E-02	G
		636.15	2.641E-02	& P	4.200E-01	1.20E-01	G
		463.51	2.630E-01	% P	4.532E-01	1.38E-01	G
		176.29	-2.509E-01	% P	6.793E-01	2.04E-01	G
I-131	1.8064E-03						
		364.48	1.806E-03	%(	4.599E-02	1.32E-02	G K
		636.97	-2.288E-02	%	7.485E-01	2.12E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
		284.29	-7.042E-02	%	7.095E-01	2.08E-01	G
CS-134	5.9852E-03						
		604.66	5.985E-03	%(	3.981E-02	1.14E-02	G K
		795.76	3.219E-02	%	6.657E-02	2.02E-02	G
		569.29	6.130E-02	&	2.791E-01	8.15E-02	G
		801.84	-2.449E-02	% P	6.042E-01	1.70E-01	G
CS-137	-7.5779E-03						
		661.62	-7.578E-03	%(	6.261E-02	1.81E-02	G
CE-139	-2.0930E-04						
		165.85	-2.093E-04	&(P	4.989E-02	1.47E-02	G
EU-152	2.6781E-02						
		121.78	2.678E-02	%(P	1.627E-01	4.86E-02	G K
		344.30	2.115E-03	&	1.533E-01	4.45E-02	G
		1408.08	4.445E-02	%	2.366E-01	6.63E-02	G
		964.00	-3.912E-02	% P	3.644E-01	1.02E-01	G
		1112.07	1.047E-03	&	4.944E-01	1.38E-01	G
		778.90	-2.274E-02	% P	3.957E-01	1.12E-01	G
EU-154	1.8064E-02						
		123.10	1.806E-02	&(P	1.041E-01	3.11E-02	G K
		1274.80	1.042E-02	&	1.787E-01	4.97E-02	G
		723.30	-1.617E-03	% P	2.589E-01	7.27E-02	G
		1004.80	0.000E+00	%	4.093E-01	1.16E-01	G
EU-155	1.0797E-01						
		86.45	1.080E-01	&(P	2.610E-01	7.89E-02	G K
		105.31	3.738E-02	%	2.504E-01	7.48E-02	G
HG-203	3.3690E-03						
		279.17	3.369E-03	%(P	4.392E-02	1.28E-02	G K
		72.87	-6.314E-01	%	2.115E+00	6.38E-01	G
		70.83	-4.799E-01	%	3.414E+00	1.02E+00	G
		82.50	-5.578E-01	&	4.128E+00	1.24E+00	G
TL-208	2.7280E-01						
		583.14	2.728E-01	(P	4.876E-02	2.48E-02	G
		510.72	5.552E-01	+	2.173E-01	9.63E-02	G
PB-212	7.0613E-01						
		238.63	6.863E-01	(	1.113E-01	4.30E-02	G K
							Energy duplication
		77.11	7.550E-01	*(	5.760E-01	1.80E-01	G
		74.81	9.320E-01	& P	1.183E+00	3.62E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
PB-214	3.8748E-01						
		351.99	4.013E-01	(P	9.878E-02	3.94E-02	G K
		295.22	3.608E-01	(	2.022E-01	6.75E-02	G
							Energy duplication
		77.11	1.235E+00	+	9.420E-01	2.94E-01	G
		241.92	2.531E-01	%	7.267E-01	2.19E-01	G
BI-212	6.1715E-01						
		727.17	6.172E-01	@(	3.283E-01	1.30E-01	G K
		1620.56	1.081E-01	% P	1.902E+00	5.02E-01	G
		785.42	3.752E-01	% P	2.449E+00	7.02E-01	G
BI-214	4.3239E-01						
		609.32	4.147E-01	(	1.072E-01	5.09E-02	G K
		1764.51	-7.258E-02	% P	3.623E-01	1.01E-01	G
		1120.28	4.865E-01	&(	4.283E-01	1.44E-01	G
RA-224	7.5607E-01						
		241.00	7.561E-01	%(P	1.306E+00	3.98E-01	G
RA-226	1.1214E+00						
		185.99	1.121E+00	@(P	1.256E+00	3.89E-01	G
AC-228	2.4104E-01						
		911.07	-1.336E-03	%(P	1.926E-01	5.35E-02	G K
		968.90	-3.546E-04	% P	3.459E-01	9.65E-02	G
		338.40	8.263E-01	(	2.869E-01	1.07E-01	G
TH-227	-2.3895E-01						
		236.00	-2.389E-01	%(P	5.005E-01	1.52E-01	G K
		256.25	-1.321E-01	%	5.723E-01	1.70E-01	G
PA-234	-5.6365E-02						
		98.44	-5.637E-02	&(	2.417E-01	7.26E-02	G K
		946.00	-4.209E-02	%	2.855E-01	8.17E-02	G
		131.28	8.449E-02	&	2.174E-01	6.57E-02	G
		94.67	-7.021E-02	%	4.305E-01	1.29E-01	G
		883.24	2.678E-03	%	4.189E-01	1.16E-01	G
		926.70	1.341E-03	&	4.933E-01	1.37E-01	G
		569.26	9.081E-02	&	4.133E-01	1.21E-01	G
TH-234	7.4982E-01						
		63.29	7.498E-01	&(P	4.568E+00	1.37E+00	G K
		92.80	1.098E+00	%	2.564E+00	7.76E-01	G
		92.38	1.229E+00	% P	2.964E+00	8.97E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
AM-241	3.0802E-02						
		59.54	3.080E-02	&(	5.133E-01	1.52E-01	G

(- This peak used in the nuclide activity average.

* - Peak is too wide, but only one peak in library.
! - Peak is part of a multiplet and this area went negative during deconvolution.
? - Peak is too narrow.
@ - Peak is too wide at FW25M, but ok at FWHM.
% - Peak fails sensitivity test.
$ - Peak identified, but first peak of this nuclide failed one or more qualification tests.
+ - Peak activity higher than counting uncertainty range.
- - Peak activity lower than counting uncertainty range.
= - Peak outside analysis energy range.
& - Calculated peak centroid is not close enough to the library energy centroid for positive identification.
P - Peakbackground subtraction
} - Peak is too close to another for the activity to be found directly.

Nuclide Codes:
T - Thermal Neutron Activation
F - Fast Neutron Activation
I - Fission Product
N - Naturally Occurring Isotope
P - Photon Reaction
C - Charged Particle Reaction
M - No MDA Calculation
R - Coincidence Corrected
H - Halflife limit exceeded

Peak Codes:
G - Gamma Ray
X - X-Ray
P - Positron Decay
S - Single-Escape
D - Double-Escape
K - Key Line
A - Not in Average
C - Coincidence Peak

- -

***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	-3.1287E-02	-3.2100E-02	3.5987E-01	3.5987E-01	4.057E-01
K-40	#A	-3.7905E-02	-3.7905E-02	8.7881E-01	8.7882E-01	8.586E-01
MN-54	#A	3.9694E-03	3.9868E-03	4.1984E-02	4.1985E-02	4.948E-02
CO-57	#B	8.8317E-03	8.8766E-03	4.8838E-02	4.8840E-02	5.420E-02
CO-60	#B	-3.0810E-04	-3.0832E-04	1.3592E-01	1.3592E-01	4.473E-02
Sr-85	#A	-9.0729E-03	-9.2666E-03	4.8211E-02	4.8214E-02	5.361E-02
Kr-85	#A	-2.0814E+02	-2.0814E+02	1.0396E+03	1.0397E+03	1.182E+03
Y-88	#B	-8.1495E-04	-8.2549E-04	4.9809E-02	4.9809E-02	5.955E-02
NB-94	#B	0.0000E+00	0.0000E+00	5.1364E-02	5.1364E-02	6.083E-02
Ag-108M	#B	-3.5376E-03	-3.5377E-03	4.3395E-02	4.3396E-02	5.117E-02
CD-109	#A	-3.6159E-02	-3.6268E-02	7.8469E+00	7.8469E+00	2.307E+00

SN-113	#B	2.0284E-04	2.0527E-04	5.7644E-02	5.7644E-02	6.576E-02
SB-125	#B	-1.6034E-02	-1.6056E-02	1.5738E-01	1.5738E-01	1.278E-01
I-131	#B	1.5235E-03	1.8064E-03	3.9529E-02	3.9530E-02	3.879E-02
CS-134	#B	5.9743E-03	5.9852E-03	3.4248E-02	3.4249E-02	3.974E-02
CS-137	#A	-7.5770E-03	-7.5779E-03	5.4250E-02	5.4252E-02	6.260E-02
CE-139	#A	-2.0723E-04	-2.0930E-04	3.1679E+00	3.1679E+00	4.940E-02
EU-152	#B	2.6773E-02	2.6781E-02	1.4590E-01	1.4591E-01	1.627E-01
EU-154	#B	1.8056E-02	1.8064E-02	9.3262E-02	9.3267E-02	1.041E-01
EU-155	#B	1.0789E-01	1.0797E-01	2.3672E-01	2.3680E-01	2.608E-01
HG-203	#B	3.2715E-03	3.3690E-03	3.8539E-02	3.8540E-02	4.265E-02
TL-208		2.7280E-01	2.7280E-01	7.4115E-02	7.5680E-02	
PB-212	#	7.0613E-01	7.0613E-01	1.3259E-01	1.3839E-01	1.113E-01
PB-214	#	3.8748E-01	3.8748E-01	1.1406E-01	1.1612E-01	9.878E-02
BI-212	#	6.1715E-01	6.1715E-01	3.9063E-01	3.9216E-01	
BI-214		4.3239E-01	4.3239E-01	1.5906E-01	1.6090E-01	
RA-224	#A	7.5607E-01	7.5607E-01	1.1941E+00	1.1948E+00	1.306E+00
RA-226	#A	1.1214E+00	1.1214E+00	1.1656E+00	1.1673E+00	1.256E+00
AC-228	F	2.4104E-01	2.4104E-01	9.3249E-02	9.4225E-02	1.926E-01
TH-227	#B	-2.3895E-01	-2.3895E-01	4.5987E-01	4.6007E-01	5.005E-01
PA-234	#B	-5.6365E-02	-5.6365E-02	2.1766E-01	2.1768E-01	2.417E-01
TH-234	#B	7.4982E-01	7.4982E-01	4.1007E+00	4.1009E+00	4.568E+00
AM-241	#A	3.0801E-02	3.0802E-02	4.5595E-01	4.5595E-01	5.133E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (1119.8 to 1999.0 keV) 1.5633866E+00 pCi/gm
Total Decayed Activity (1119.8 to 1999.0 keV) 1.5633866E+00 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
DAT

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 102F_27JUL2006_1154.An1

Sample description
FSS-OOL-05-06-008-F

Spectrum Filename: C:\GammaVision\Spectra\102F_27JUL2006_1154.An1

Acquisition information
Start time: 27-Jul-2006 11:54:37
Live time: 2000
Real time: 2017
Dead time: 0.86 %
Detector ID: 3

Detector system
Det 102 - DSPP-468

Calibration
Filename: D2_1LSa.Clb
DET 102 1 Liter Sand Geometry

Energy Calibration
Created: 15-Jan-2005 03:09:29
Zero offset: 0.220 keV
Gain: 0.500 keV/channel
Quadratic: -6.435E-08 keV/channel^2

Efficiency Calibration
Created: 15-Jan-2005 06:48:10
Type: Polynomial
Uncertainty: 0.497 %
Coefficients: -0.294180 -5.980622 0.744607
-0.096737 0.005214 -0.000120

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.22keV)
Stop channel: 4000 (1999.02keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 1.6510E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.6510E+03) =
6.0569E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	24-Jul-2006 21:42:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	102_150K_28APR05.Pbc 01-May-2005 05:27:47
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 13 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.7494

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
76.79	270.	16.07	1.18	9.447E-03	77.11	17.500	1.323E+00	PB212
					77.11	10.700	2.163E+00	PB214
87.23	78.	40.20	1.27	1.217E-02	86.45	32.740	PBC<MDA	EU155
					88.04	3.790	PBC<MDA	CD109
92.79	90.	34.31	1.17	1.333E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	1.838E+00	TH234
185.65	139.	21.76	1.62	1.628E-02				
185.65	139.	21.76	1.62	1.628E-02	185.99	3.280	2.066E+00	RA226
239.50	509.	7.58	1.04	1.376E-02	238.63	43.100	7.002E-01	PB212
242.33	58.	36.74	1.22	1.365E-02	241.00	3.900	PBC<MDA	RA224
					241.92	7.470	4.692E-01	PB214
270.93	56.	34.86	1.72	1.240E-02				
294.91	118.	19.28	1.00	1.148E-02	295.22	19.200	4.380E-01	PB214
338.25	140.	13.73	1.40	1.006E-02	338.40	12.010	9.484E-01	AC228
352.51	158.	11.48	1.12	9.665E-03	351.99	37.100	3.590E-01	PB214
511.37	99.	19.09	1.70	6.687E-03	510.72	22.500	5.396E-01	TL208
584.24	162.	12.81	0.87	5.879E-03	583.14	86.000	2.611E-01	TL208
610.02	153.	11.13	1.05	5.643E-03	609.32	46.090	4.806E-01	BI214
727.83	24.	38.75	1.55	4.794E-03	727.17	11.800	PBC<MDA	BI212
912.41	93.	14.37	1.79	3.917E-03	911.07	29.000	6.648E-01	AC228
970.44	43.	21.11	1.62	3.713E-03	968.90	17.460	5.380E-01	AC228
1121.96	50.	26.25	1.12	3.283E-03	1120.28	15.040	8.222E-01	BI214
1462.63	431.	4.82	1.96	2.618E-03	1460.75	10.700	1.258E+01	K40
1766.58	25.	21.61	1.33	2.225E-03	1764.51	15.920	5.825E-01	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
174.03	87.23	436.	78.	0.039	117.81	1.265	BI-207	
185.16	92.79	409.	90.	0.045	102.92	1.171	TH-234	l
541.51	270.93	128.	56.	0.028	104.57	1.720	AC-228	s

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-212	153.80	77.11	335.	121.	0.061	68.49	1.100A
RA-226	372.09	186.24	274.	93.	0.047	77.61	1.500s
PB-212	476.89	238.63	93.	432.	0.216	17.28	1.215D
PB-214	483.47	241.92	202.	58.	0.029	110.23	1.217D
PB-214	589.48	294.91	142.	118.	0.059	57.85	1.005s
AC-228	676.17	338.25	85.	140.	0.070	41.19	1.401s
PB-214	704.70	352.51	74.	158.	0.079	34.43	1.119
TL-208	1022.52	511.37	67.	99.	0.050	57.28	1.701s
TL-208	1168.32	584.24	64.	162.	0.081	38.44	0.867s
BI-214	1219.90	610.02	44.	153.	0.076	33.39	1.047s
BI-212	1455.62	727.83	31.	24.	0.012	116.24	1.554s
AC-228	1824.95	912.41	27.	92.	0.046	43.11	1.788
AC-228	1941.08	970.44	13.	43.	0.021	63.34	1.620
BI-214	2244.31	1121.96	32.	50.	0.025	78.74	1.116s
K-40	2926.30	1462.70	7.	408.	0.204	15.10	2.042
BI-214	3534.62	1766.58	2.	25.	0.013	64.83	1.331s

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	MDA Value pCi/gm	COMMENTS
BE-7		-1.2544E-01					
			477.56	-1.254E-01	%(	4.351E-01 1.28E-01	G
K-40		1.1916E+01					
			1460.75	1.192E+01	(P	4.469E-01 6.00E-01	G
MN-54		-7.5670E-03					
			834.81	-7.567E-03	%(P	6.182E-02 1.75E-02	G
CO-57		8.3186E-03					
			122.07	8.319E-03	%(	5.432E-02 1.62E-02	G K
			136.43	3.520E-02	%	3.461E-01 1.02E-01	G
CO-60		1.3559E-03					
			1332.51	1.356E-03	%(P	6.468E-02 1.73E-02	G K
			1173.23	-3.992E-03	&	7.466E-02 2.08E-02	G K
Sr-85		-1.7981E-02					
			514.00	-1.798E-02	%(	6.019E-02 1.79E-02	G
Kr-85		-4.0375E+02					
			513.99	-4.037E+02	%(	1.352E+03 4.01E+02	G
Y-88		9.1102E-03					
			1836.01	9.110E-03	%(P	3.359E-02 9.18E-03	G K
			898.02	-1.266E-02	% P	6.444E-02 1.83E-02	G
NB-94		4.6370E-03					
			871.10	4.637E-03	&(	4.527E-02 1.25E-02	G K
			702.50	-1.774E-03	%	4.643E-02 1.28E-02	G K
Ag-108M		-1.2754E-02					
			722.95	-1.275E-02	&(	6.458E-02 1.87E-02	G K
			614.37	-2.373E-02	% P	6.624E-02 1.97E-02	G
			433.93	-2.057E-03	%	4.067E-02 1.15E-02	G
CD-109		-1.7561E-01					
			88.04	-1.756E-01	%(P	2.420E+00 7.21E-01	G
SN-113		9.3208E-03					
			391.71	9.321E-03	%(	7.533E-02 2.20E-02	G K
			255.04	-3.042E-01	&	2.018E+00 5.95E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	-3.9441E-02						
		427.95	-3.944E-02	&(P	1.336E-01	3.90E-02	G K
		600.77	1.316E-02	& P	2.557E-01	7.18E-02	G
		636.15	-9.235E-04	% P	4.825E-01	1.35E-01	G
		463.51	5.743E-02	% P	4.229E-01	1.21E-01	G
		176.29	5.905E-02	& P	6.487E-01	1.91E-01	G
I-131	1.2857E-02						
		364.48	1.286E-02	%(	5.435E-02	1.59E-02	G K
		636.97	-5.562E-02	%	7.300E-01	2.04E-01	G
		284.29	-6.307E-02	&	7.963E-01	2.32E-01	G
CS-134	-9.0119E-03						
		604.66	-9.012E-03	%(	5.344E-02	1.54E-02	G K
		795.76	1.763E-02	%	6.530E-02	1.91E-02	G
		569.29	1.265E-01	%	2.750E-01	8.32E-02	G
		801.84	-9.596E-03	% P	6.139E-01	1.69E-01	G
CS-137	1.1690E-02						
		661.62	1.169E-02	&(	5.593E-02	1.61E-02	G
CE-139	-5.0781E-04						
		165.85	-5.078E-04	&(P	4.919E-02	1.44E-02	G
EU-152	2.3552E-02						
		121.78	2.355E-02	%(P	1.621E-01	4.82E-02	G K
		344.30	3.973E-03	%	1.562E-01	4.50E-02	G
		1408.08	-3.439E-02	%	2.205E-01	5.95E-02	G
		964.00	1.254E-03	% P	4.442E-01	1.22E-01	G
		1112.07	-3.082E-02	&	4.901E-01	1.36E-01	G
		778.90	-9.083E-02	% P	4.448E-01	1.28E-01	G
EU-154	-8.2459E-03						
		123.10	-8.246E-03	&(P	1.199E-01	3.55E-02	G K
		1274.80	-6.556E-03	&	1.877E-01	5.10E-02	G
		723.30	-1.935E-03	& P	3.866E-01	1.10E-01	G
		1004.80	7.713E-02	%	3.218E-01	9.26E-02	G
EU-155	9.8096E-03						
		86.45	9.810E-03	%(P	2.816E-01	8.38E-02	G K
		105.31	2.821E-02	&	2.349E-01	6.98E-02	G
HG-203	8.4815E-03						
		279.17	8.482E-03	&(P	4.893E-02	1.44E-02	G K
		72.87	-3.951E-01	%	2.224E+00	6.66E-01	G
		70.83	-7.648E-01	%	3.735E+00	1.12E+00	G
		82.50	-5.405E-01	%	3.913E+00	1.17E+00	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	2.6112E-01						
		583.14	2.611E-01	(P	6.481E-02	3.36E-02	G
		510.72	5.396E-01	+	2.215E-01	1.03E-01	G
PB-212	5.9386E-01						
		238.63	5.939E-01	(	6.560E-02	3.42E-02	G K
							Energy duplication
		77.11	5.939E-01	}	4.311E-01	1.36E-01	G
		74.81	2.873E-01	% P	1.312E+00	3.93E-01	G
PB-214	3.9572E-01						
		351.99	3.590E-01	(P	9.785E-02	4.14E-02	G K
		295.22	4.380E-01	*(	2.167E-01	8.44E-02	G
							Energy duplication
		77.11	3.166E-01	}	9.775E-01	2.64E-01	G
		241.92	4.692E-01	(	5.526E-01	1.72E-01	G
BI-212	3.4505E-01						
		727.17	3.451E-01	&(	4.132E-01	1.34E-01	G K
		1620.56	-4.167E-02	& P	2.038E+00	5.06E-01	G
		785.42	-1.251E-01	% P	2.903E+00	8.12E-01	G
BI-214	5.0680E-01						
		609.32	4.806E-01	@(	1.058E-01	5.36E-02	G K
		1764.51	5.825E-01	(P	2.065E-01	1.26E-01	G
		1120.28	8.222E-01	+	4.846E-01	2.16E-01	G
RA-224	6.7580E-01						
		241.00	6.758E-01	%(P	1.380E+00	4.18E-01	G
RA-226	1.4274E+00						
		185.99	1.427E+00	*(P	1.225E+00	3.87E-01	G
AC-228	6.1711E-01						
		911.07	6.648E-01	(P	1.926E-01	9.59E-02	G K
		968.90	5.380E-01	(P	2.487E-01	1.14E-01	G
		338.40	9.484E-01	+	3.094E-01	1.30E-01	G
TH-227	-1.9575E-01						
		236.00	-1.957E-01	%(P	4.906E-01	1.48E-01	G K
		256.25	1.215E-01	%	5.782E-01	1.71E-01	G
PA-234	-3.4017E-02						
		98.44	-3.402E-02	&(	2.376E-01	7.08E-02	G K
		946.00	0.000E+00	%	2.288E-01	6.06E-02	G
		131.28	9.649E-02	%	2.091E-01	6.34E-02	G
		94.67	-2.078E-01	&	4.857E-01	1.47E-01	G
		883.24	3.958E-02	&	4.149E-01	1.15E-01	G
		926.70	1.256E-02	%	3.589E-01	9.44E-02	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26 1.872E-01 %   4.070E-01 1.23E-01 G

TH-234       1.3799E+00
                           63.29 1.380E+00 &(P 3.932E+00 1.18E+00 G K
                           92.80 1.755E+00 %   2.479E+00 7.59E-01 G
                           92.38 2.000E+00 % P 2.960E+00 9.05E-01 G

AM-241      -1.2598E-01
                           59.54-1.260E-01 &(  6.496E-01 1.94E-01 G
   ( - This peak used in the nuclide activity average.

   * - Peak is too wide, but only one peak in library.
   ! - Peak is part of a multiplet and this area went
       negative during deconvolution.
   ? - Peak is too narrow.
   @ - Peak is too wide at FW25M, but ok at FWHM.
   % - Peak fails sensitivity test.
   $ - Peak identified, but first peak of this nuclide
       failed one or more qualification tests.
   + - Peak activity higher than counting uncertainty range.
   - - Peak activity lower than counting uncertainty range.
   = - Peak outside analysis energy range.
   & - Calculated peak centroid is not close enough to the
       library energy centroid for positive identification.
   P - Peakbackground subtraction
   } - Peak is too close to another for the activity
       to be found directly.

   Nuclide Codes:                      Peak Codes:
   T - Thermal Neutron Activation      G - Gamma Ray
   F - Fast Neutron Activation         X - X-Ray
   I - Fission Product                 P - Positron Decay
   N - Naturally Occurring Isotope     S - Single-Escape
   P - Photon Reaction                 D - Double-Escape
   C - Charged Particle Reaction       K - Key Line
   M - No MDA Calculation              A - Not in Average
   R - Coincidence Corrected           C - Coincidence Peak
   H - Halflife limit exceeded

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
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***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	-1.2129E-01	-1.2544E-01	3.8502E-01	3.8509E-01	4.207E-01
K-40		1.1916E+01	1.1916E+01	1.8004E+00	1.9206E+00	4.469E-01
MN-54	#A	-7.5236E-03	-7.5670E-03	5.8647E-02	5.8648E-02	6.147E-02
CO-57	#B	8.2635E-03	8.3186E-03	4.8487E-02	4.8489E-02	5.396E-02
CO-60	#B	1.3547E-03	1.3559E-03	5.2040E-02	5.2040E-02	6.462E-02

Sr-85	#A	-1.7490E-02	-1.7981E-02	5.3614E-02	5.3624E-02	5.854E-02
Kr-85	#A	-4.0374E+02	-4.0375E+02	1.2039E+03	1.2041E+03	1.352E+03
Y-88	#B	8.9579E-03	9.1102E-03	2.7538E-02	2.7542E-02	3.303E-02
NB-94	#B	4.6370E-03	4.6370E-03	3.7398E-02	3.7399E-02	4.527E-02
Ag-108M	#B	-1.2754E-02	-1.2754E-02	5.6120E-02	5.6124E-02	6.458E-02
CD-109	#A	-1.7492E-01	-1.7561E-01	2.9181E+00	2.9181E+00	2.410E+00
SN-113	#B	9.1764E-03	9.3208E-03	6.5867E-02	6.5869E-02	7.416E-02
SB-125	#B	-3.9371E-02	-3.9441E-02	1.3965E-01	1.3966E-01	1.334E-01
I-131	#B	1.0282E-02	1.2857E-02	4.7814E-02	4.7819E-02	4.346E-02
CS-134	#B	-8.9904E-03	-9.0119E-03	4.6319E-02	4.6322E-02	5.331E-02
CS-137	#A	1.1688E-02	1.1690E-02	4.8413E-02	4.8417E-02	5.592E-02
CE-139	#A	-5.0122E-04	-5.0781E-04	1.3862E-01	1.3862E-01	4.855E-02
EU-152	#B	2.3543E-02	2.3552E-02	1.4460E-01	1.4461E-01	1.620E-01
EU-154	#B	-8.2412E-03	-8.2459E-03	1.1312E-01	1.1312E-01	1.198E-01
EU-155	#B	9.7998E-03	9.8096E-03	2.5129E-01	2.5129E-01	2.813E-01
HG-203	#B	8.1607E-03	8.4815E-03	4.3174E-02	4.3177E-02	4.707E-02
TL-208		2.6112E-01	2.6112E-01	1.0062E-01	1.0168E-01	
PB-212		5.9386E-01	5.9386E-01	1.0260E-01	1.0787E-01	
PB-214		3.9572E-01	3.9572E-01	1.3657E-01	1.3836E-01	
BI-212	#A	3.4505E-01	3.4505E-01	4.0109E-01	4.0155E-01	4.132E-01
BI-214		5.0680E-01	5.0680E-01	1.6922E-01	1.7160E-01	
RA-224	#A	6.7580E-01	6.7580E-01	1.2553E+00	1.2559E+00	1.380E+00
RA-226	#	1.4274E+00	1.4274E+00	1.1609E+00	1.1637E+00	1.225E+00
AC-228		6.1711E-01	6.1711E-01	2.3672E-01	2.3924E-01	
TH-227	#B	-1.9575E-01	-1.9575E-01	4.5083E-01	4.5096E-01	4.906E-01
PA-234	#B	-3.4017E-02	-3.4017E-02	2.1238E-01	2.1239E-01	2.376E-01
TH-234	#B	1.3799E+00	1.3799E+00	3.5491E+00	3.5499E+00	3.932E+00
AM-241	#A	-1.2598E-01	-1.2598E-01	5.8175E-01	5.8179E-01	6.496E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (270.7 to 1999.0 keV) 1.4636131E+01 pCi/gm
Total Decayed Activity (270.7 to 1999.0 keV) 1.4636131E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
DAT

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 102F_27JUL2006_1252.An1

Sample description
FSS-OOL-05-06-007-F

Spectrum Filename: C:\GammaVision\Spectra\102F_27JUL2006_1252.An1

Acquisition information
Start time: 27-Jul-2006 12:52:18
Live time: 2000
Real time: 2019
Dead time: 0.93 %
Detector ID: 3

Detector system
Det 102 - DSPP-468

Calibration
Filename: D2_1LSa.Clb
DET 102 1 Liter Sand Geometry

Energy Calibration
Created: 15-Jan-2005 03:09:29
Zero offset: 0.220 keV
Gain: 0.500 keV/channel
Quadratic: -6.435E-08 keV/channel^2

Efficiency Calibration
Created: 15-Jan-2005 06:48:10
Type: Polynomial
Uncertainty: 0.497 %
Coefficients: -0.294180 -5.980622 0.744607
-0.096737 0.005214 -0.000120

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.22keV)
Stop channel: 4000 (1999.02keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 1.9000E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.9000E+03) =
5.2632E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

YAEC Chemistry Lab Spectrum name: 102F_27JUL2006_1252.An1

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	24-Jul-2006 21:18:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	102_150K_28APR05.Pbc 01-May-2005 05:27:47
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 11 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.4594

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
77.18	128.	32.06	1.50	9.541E-03	77.11	10.700	PBC<MDA	PB214
					77.11	17.500	5.449E-01	PB212
77.18	128.	32.06	1.50	9.541E-03	77.11	10.700	8.912E-01	PB214
					77.11	17.500	5.449E-01	PB212
209.72	66.	33.30	1.06	1.517E-02				
239.03	455.	5.72	1.22	1.379E-02	238.63	43.100	5.434E-01	PB212
242.16	83.	23.22	1.22	1.364E-02	241.00	3.900	PBC<MDA	RA224
					241.92	7.470	5.757E-01	PB214
295.67	110.	22.71	0.91	1.145E-02	295.22	19.200	3.567E-01	PB214
339.07	98.	16.14	1.38	1.004E-02	338.40	12.010	5.740E-01	AC228
352.42	234.	10.28	1.32	9.667E-03	351.99	37.100	4.631E-01	PB214
463.66	46.	31.95	1.06	7.362E-03	463.51	10.000	4.310E-01	SB125
511.47	96.	18.81	1.29	6.685E-03	510.72	22.500	4.552E-01	TL208
584.11	186.	10.76	1.59	5.881E-03	583.14	86.000	2.609E-01	TL208
610.09	149.	12.79	1.46	5.643E-03	609.32	46.090	4.059E-01	BI214
727.85	52.	30.04	1.09	4.794E-03	727.17	11.800	6.538E-01	BI212
912.37	92.	14.90	1.48	3.917E-03	911.07	29.000	5.739E-01	AC228
1121.02	48.	25.19	1.66	3.283E-03	1120.28	15.040	6.928E-01	BI214
1462.92	501.	4.60	1.92	2.617E-03	1460.75	10.700	1.271E+01	K40

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
419.05	209.72	191.	66.	0.033	99.90	1.059	NP-239	s
477.68	239.05	111.	455.	0.227	17.17	1.215	PB-212	D

Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM	Suspected	
483.95	242.18	142.	83.	0.041	69.65	1.217	PB-214	D

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-214	153.80	77.11	777.	128.	0.064	96.17	1.500D
PB-212	153.80	77.11	777.	128.	0.064	96.17	1.500D
PB-212	477.71	239.04	327.	404.	0.202	24.15	1.500
PB-214	590.97	295.66	165.	104.	0.052	60.06	1.500
AC-228	677.70	339.01	104.	105.	0.053	50.41	1.500
PB-214	704.70	352.51	68.	215.	0.107	26.10	1.500
SB-125	927.79	464.02	48.	36.	0.018	91.69	1.500s
TL-208	1022.73	511.47	73.	96.	0.048	56.42	1.289
TL-208	1168.04	584.11	60.	186.	0.093	32.28	1.588s
BI-214	1220.03	610.09	64.	149.	0.074	38.36	1.461s
BI-212	1455.66	727.85	48.	52.	0.026	90.12	1.090
AC-228	1825.18	912.52	28.	78.	0.039	44.59	1.679s
BI-214	2242.43	1121.02	30.	48.	0.024	75.56	1.663
K-40	2926.80	1462.95	8.	480.	0.240	13.92	2.042

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	Peak MDA Value pCi/gm	COMMENTS
BE-7		-1.0639E-02					
			477.56	-1.064E-02	%(	4.517E-01 1.29E-01	G
K-40		1.2174E+01					
			1460.75	1.217E+01	(P	4.074E-01 5.65E-01	G
MN-54		-1.5363E-02					
			834.81	-1.536E-02	%(P	5.664E-02 1.65E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CO-57	-6.3478E-03						
		122.07	-6.348E-03	%(	4.476E-02	1.33E-02	G K
		136.43	8.295E-03	&	4.298E-01	1.27E-01	G
CO-60	-1.6682E-04						
		1332.51	-1.668E-04	&(P	6.166E-02	1.66E-02	G K
		1173.23	-1.092E-02	&	7.650E-02	2.19E-02	G K
Sr-85	-6.0109E-03						
		514.00	-6.011E-03	%(	4.850E-02	1.40E-02	G
Kr-85	-1.3447E+02						
		513.99	-1.345E+02	%(	1.088E+03	3.15E+02	G
Y-88	-1.2035E-03						
		1836.01	-1.204E-03	%(P	5.091E-02	1.28E-02	G K
		898.02	-8.955E-03	% P	5.730E-02	1.61E-02	G
NB-94	2.0318E-03						
		871.10	2.032E-03	&(	4.893E-02	1.35E-02	G K
		702.50	-5.199E-03	%	4.578E-02	1.30E-02	G K
Ag-108M	-8.8639E-03						
		722.95	-8.864E-03	%(	5.230E-02	1.50E-02	G K
		614.37	-3.209E-02	% P	7.123E-02	2.15E-02	G
		433.93	-4.727E-03	%	4.625E-02	1.34E-02	G
CD-109	-1.2583E-01						
		88.04	-1.258E-01	%(P	1.800E+00	5.35E-01	G
SN-113	1.6358E-03						
		391.71	1.636E-03	%(	5.713E-02	1.63E-02	G K
		255.04	1.693E-01	%	1.903E+00	5.60E-01	G
SB-125	9.2292E-02						
		427.95	6.854E-03	%(P	1.148E-01	3.25E-02	G K
		600.77	-2.740E-02	& P	2.351E-01	6.70E-02	G
		636.15	-6.959E-02	% P	4.442E-01	1.28E-01	G
		463.51	3.452E-01	@(P	3.375E-01	1.10E-01	G
		176.29	-6.450E-02	% P	6.226E-01	1.84E-01	G
I-131	2.7651E-03						
		364.48	2.765E-03	%(	4.998E-02	1.43E-02	G K
		636.97	0.000E+00	%	9.549E-01	2.71E-01	G
		284.29	-6.491E-02	%	7.831E-01	2.29E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CS-134	8.1886E-03						
		604.66	8.189E-03	%(	4.838E-02	1.40E-02	G K
		795.76	1.930E-02	%	5.786E-02	1.71E-02	G
		569.29	7.183E-02	%	2.967E-01	8.70E-02	G
		801.84	-7.596E-02	% P	5.927E-01	1.69E-01	G
CS-137	8.0450E-03						
		661.62	8.045E-03	%(	4.066E-02	1.16E-02	G
CE-139	1.5894E-02						
		165.85	1.589E-02	&(P	4.240E-02	1.28E-02	G
EU-152	-2.7361E-02						
		121.78	-2.736E-02	%(P	1.378E-01	4.10E-02	G K
		344.30	2.016E-03	%	1.348E-01	3.88E-02	G
		1408.08	-5.433E-02	%	2.837E-01	8.02E-02	G
		964.00	-3.006E-03	% P	4.464E-01	1.24E-01	G
		1112.07	8.866E-02	&	3.970E-01	1.14E-01	G
		778.90	9.889E-03	% P	3.677E-01	1.02E-01	G
EU-154	-1.3933E-03						
		123.10	-1.393E-03	%(P	1.059E-01	3.13E-02	G K
		1274.80	-4.042E-02	&	1.944E-01	5.59E-02	G
		723.30	-1.905E-02	% P	2.442E-01	6.87E-02	G
		1004.80	-9.949E-03	%	2.342E-01	6.27E-02	G
EU-155	6.5933E-03						
		86.45	6.593E-03	&(P	2.433E-01	7.23E-02	G K
		105.31	5.976E-02	%	2.315E-01	6.94E-02	G
HG-203	-3.0607E-03						
		279.17	-3.061E-03	%(P	4.543E-02	1.33E-02	G K
		72.87	-2.071E-01	%	2.017E+00	6.03E-01	G
		70.83	0.000E+00	%	4.290E+00	1.28E+00	G
		82.50	-1.235E+00	%	3.880E+00	1.17E+00	G
TL-208	2.6088E-01						
		583.14	2.609E-01	@(P	5.458E-02	2.82E-02	G
		510.72	4.552E-01	+	2.003E-01	8.57E-02	G
PB-212	5.0087E-01						
		238.63	4.830E-01	(	1.040E-01	3.89E-02	G K
							Energy duplication
		77.11	5.449E-01	@(	5.648E-01	1.75E-01	G
		74.81	7.497E-01	% P	1.172E+00	3.57E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
PB-214	4.2501E-01						
		351.99	4.250E-01	(P	8.139E-02	3.70E-02	G K
		295.22	3.365E-01	-	2.024E-01	6.74E-02	G
							Energy duplication
		77.11	8.912E-01	+	9.237E-01	2.86E-01	G
		241.92	4.061E-01	%	6.479E-01	1.98E-01	G
BI-212	6.5378E-01						
		727.17	6.538E-01	(	4.400E-01	1.97E-01	G K
		1620.56	-1.787E-01	% P	2.015E+00	5.30E-01	G
		785.42	3.520E-01	% P	2.602E+00	7.43E-01	G
BI-214	4.0591E-01						
		609.32	4.059E-01	@(	1.096E-01	5.20E-02	G K
		1764.51	-3.593E-02	& P	4.191E-01	1.13E-01	G
		1120.28	6.928E-01	+	4.061E-01	1.75E-01	G
RA-224	7.9783E-01						
		241.00	7.978E-01	&(P	1.234E+00	3.78E-01	G
RA-226	8.1466E-01						
		185.99	8.147E-01	%(P	1.238E+00	3.78E-01	G
AC-228	5.2450E-01						
		911.07	4.850E-01	@(P	1.716E-01	7.23E-02	G K
		968.90	1.177E-02	% P	3.880E-01	1.09E-01	G
		338.40	6.198E-01	(	2.955E-01	1.04E-01	G
TH-227	-6.1550E-03						
		236.00	-6.155E-03	%(P	4.927E-01	1.46E-01	G K
		256.25	3.229E-03	%	5.493E-01	1.60E-01	G
PA-234	8.5277E-04						
		98.44	8.528E-04	%(	2.388E-01	7.08E-02	G K
		946.00	0.000E+00	&	1.988E-01	5.26E-02	G
		131.28	-6.664E-02	%	2.348E-01	7.05E-02	G
		94.67	-1.035E-01	%	4.239E-01	1.27E-01	G
		883.24	-4.354E-02	&	4.089E-01	1.15E-01	G
		926.70	7.705E-02	%	3.536E-01	1.00E-01	G
		569.26	1.063E-01	%	4.392E-01	1.29E-01	G
TH-234	3.3567E-01						
		63.29	3.357E-01	&(P	4.314E+00	1.28E+00	G K
		92.80	1.396E+00	%	2.315E+00	7.06E-01	G
		92.38	1.563E+00	% P	2.763E+00	8.41E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
AM-241	-1.8239E-01						
		59.54	-1.824E-01	%(	6.684E-01	2.01E-01	G

(- This peak used in the nuclide activity average.

* - Peak is too wide, but only one peak in library.
! - Peak is part of a multiplet and this area went negative during deconvolution.
? - Peak is too narrow.
@ - Peak is too wide at FW25M, but ok at FWHM.
% - Peak fails sensitivity test.
$ - Peak identified, but first peak of this nuclide failed one or more qualification tests.
+ - Peak activity higher than counting uncertainty range.
- - Peak activity lower than counting uncertainty range.
= - Peak outside analysis energy range.
& - Calculated peak centroid is not close enough to the library energy centroid for positive identification.
P - Peakbackground subtraction
} - Peak is too close to another for the activity to be found directly.

Nuclide Codes:
T - Thermal Neutron Activation
F - Fast Neutron Activation
I - Fission Product
N - Naturally Occurring Isotope
P - Photon Reaction
C - Charged Particle Reaction
M - No MDA Calculation
R - Coincidence Corrected
H - Halflife limit exceeded

Peak Codes:
G - Gamma Ray
X - X-Ray
P - Positron Decay
S - Single-Escape
D - Double-Escape
K - Key Line
A - Not in Average
C - Coincidence Peak

- -

***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	-1.0279E-02	-1.0639E-02	3.8786E-01	3.8786E-01	4.365E-01
K-40		1.2174E+01	1.2174E+01	1.6950E+00	1.8275E+00	4.074E-01
MN-54	#A	-1.5273E-02	-1.5363E-02	5.2020E-02	5.2027E-02	5.631E-02
CO-57	#B	-6.3048E-03	-6.3478E-03	3.9879E-02	3.9881E-02	4.445E-02
CO-60	#B	-1.6666E-04	-1.6682E-04	6.3105E-01	6.3105E-01	6.160E-02
Sr-85	#A	-5.8431E-03	-6.0109E-03	4.2141E-02	4.2142E-02	4.715E-02
Kr-85	#A	-1.3446E+02	-1.3447E+02	9.4555E+02	9.4558E+02	1.088E+03
Y-88	#B	-1.1830E-03	-1.2035E-03	3.9890E-02	3.9890E-02	5.004E-02
NB-94	#B	2.0318E-03	2.0318E-03	4.0642E-02	4.0642E-02	4.893E-02
Ag-108M	#B	-8.8635E-03	-8.8639E-03	4.5058E-02	4.5061E-02	5.230E-02
CD-109	#A	-1.2532E-01	-1.2583E-01	2.3081E+00	2.3081E+00	1.793E+00

SN-113	#B	1.6099E-03	1.6358E-03	4.9017E-02	4.9017E-02	5.623E-02
SB-125	#B	9.2125E-02	9.2292E-02	8.8293E-02	8.8445E-02	1.146E-01
I-131	#B	2.2006E-03	2.7651E-03	4.2941E-02	4.2941E-02	3.977E-02
CS-134	#B	8.1687E-03	8.1886E-03	4.2018E-02	4.2021E-02	4.826E-02
CS-137	#A	8.0436E-03	8.0450E-03	3.4764E-02	3.4767E-02	4.065E-02
CE-139	#A	1.5683E-02	1.5894E-02	3.8283E-02	3.8293E-02	4.184E-02
EU-152	#B	-2.7350E-02	-2.7361E-02	1.3509E-01	1.3510E-01	1.377E-01
EU-154	#B	-1.3925E-03	-1.3933E-03	1.2794E-01	1.2794E-01	1.058E-01
EU-155	#B	6.5866E-03	6.5933E-03	2.1703E-01	2.1703E-01	2.431E-01
HG-203	#B	-2.9425E-03	-3.0607E-03	4.1604E-02	4.1604E-02	4.368E-02
TL-208		2.6088E-01	2.6088E-01	8.4403E-02	8.5663E-02	
PB-212	#	5.0087E-01	5.0087E-01	1.2098E-01	1.2420E-01	1.040E-01
PB-214	#	4.2501E-01	4.2501E-01	1.1114E-01	1.1367E-01	8.139E-02
BI-212		6.5378E-01	6.5378E-01	5.8918E-01	5.9032E-01	
BI-214		4.0591E-01	4.0591E-01	1.5573E-01	1.5738E-01	
RA-224	#A	7.9783E-01	7.9783E-01	1.1328E+00	1.1336E+00	1.234E+00
RA-226	#A	8.1466E-01	8.1466E-01	1.1352E+00	1.1361E+00	1.238E+00
AC-228	#	5.2450E-01	5.2450E-01	1.7672E-01	1.7916E-01	1.716E-01
TH-227	#B	-6.1550E-03	-6.1550E-03	6.7189E-01	6.7189E-01	4.927E-01
PA-234	#B	8.5277E-04	8.5277E-04	2.1254E-01	2.1254E-01	2.388E-01
TH-234	#B	3.3567E-01	3.3567E-01	3.8494E+00	3.8495E+00	4.314E+00
AM-241	#A	-1.8239E-01	-1.8239E-01	6.0235E-01	6.0244E-01	6.684E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (277.7 to 1999.0 keV) 1.3494802E+01 pCi/gm
Total Decayed Activity (277.7 to 1999.0 keV) 1.3494802E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
DAT

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 102F_27JUL2006_1329.An1

Sample description
FSS-OOL-05-06-005-F

Spectrum Filename: C:\GammaVision\Spectra\102F_27JUL2006_1329.An1

Acquisition information
Start time: 27-Jul-2006 13:29:35
Live time: 2000
Real time: 2018
Dead time: 0.91 %
Detector ID: 3

Detector system
Det 102 - DSPP-468

Calibration
Filename: D2_1LSa.Clb
DET 102 1 Liter Sand Geometry

Energy Calibration
Created: 15-Jan-2005 03:09:29
Zero offset: 0.220 keV
Gain: 0.500 keV/channel
Quadratic: -6.435E-08 keV/channel^2

Efficiency Calibration
Created: 15-Jan-2005 06:48:10
Type: Polynomial
Uncertainty: 0.497 %
Coefficients: -0.294180 -5.980622 0.744607
-0.096737 0.005214 -0.000120

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.22keV)
Stop channel: 4000 (1999.02keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 2.0360E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 2.0360E+03) =
4.9116E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit:	12.000
Activity range factor:	2.000
Min. step backg. energy	0.000
Multiplet shift channel	2.000

Corrections	Status	Comments
Decay correct to date:	YES	20-Jul-2006 21:13:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	102_150K_28APR05.Pbc 01-May-2005 05:27:47
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 10 cutoff 20.00000 %

Energy Calibration

Normalized diff: 0.4877

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
76.52	216.	18.88	1.02	9.365E-03				
76.52	216.	18.88	1.02	9.365E-03	77.11	10.700	1.404E+00	PB214
					77.11	17.500	8.586E-01	PB212
186.33	111.	22.51	1.84	1.625E-02	185.99	3.280	1.330E+00	RA226
239.02	421.	5.96	1.22	1.379E-02	238.63	43.100	4.691E-01	PB212
242.28	70.	24.60	1.22	1.364E-02	241.00	3.900	PBC<MDA	RA224
					241.92	7.470	4.538E-01	PB214
295.82	116.	19.47	0.86	1.144E-02	295.22	19.200	3.482E-01	PB214
327.86	73.	22.90	1.17	1.037E-02				
339.03	81.	23.85	0.83	1.004E-02	338.40	12.010	4.472E-01	AC228
352.46	225.	10.53	1.20	9.666E-03	351.99	37.100	4.144E-01	PB214
511.62	81.	18.76	2.09	6.695E-03	510.72	22.500	3.569E-01	TL208
584.30	134.	12.71	1.06	5.879E-03	583.14	86.000	1.751E-01	TL208
610.31	142.	11.42	1.32	5.641E-03	609.32	46.090	3.610E-01	BI214
912.70	76.	13.96	1.32	3.916E-03				
1121.23	37.	38.23	1.36	3.283E-03	1120.28	15.040	5.027E-01	BI214
1462.96	527.	4.41	1.94	2.617E-03	1460.75	10.700	1.247E+01	K40

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

Peak Centroid Channel	Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
477.67	238.97	104.	421.	0.210	17.88	1.215	PB-212	D
484.20	242.24	112.	70.	0.035	73.80	1.217	PB-214	D
655.40	327.86	78.	73.	0.036	68.70	1.169	AC-228	M
1825.53	912.70	12.	81.	0.041	37.93	1.320	AC-228	M

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.
M - Peak is close to a library peak.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-214	153.80	77.11	699.	142.	0.071	83.05	1.500D
PB-212	153.80	77.11	699.	142.	0.071	83.05	1.500D
RA-226	372.54	186.47	290.	91.	0.046	80.99	1.500s
PB-212	477.63	239.00	276.	354.	0.177	25.51	1.500s
RA-224	483.48	241.93	239.	74.	0.037	93.66	1.500
PB-214	483.49	241.93	270.	63.	0.032	116.07	1.500
PB-214	591.33	295.84	139.	106.	0.053	55.26	1.500
AC-228	677.23	338.78	127.	68.	0.034	79.52	1.500
PB-214	704.78	352.55	72.	201.	0.101	27.62	1.500
TL-208	1023.02	511.62	50.	81.	0.041	56.29	2.087s
TL-208	1168.44	584.30	52.	134.	0.067	38.13	1.062s
BI-214	1220.47	610.31	37.	142.	0.071	34.25	1.323s
BI-214	2242.86	1121.23	51.	37.	0.019	114.68	1.360s
K-40	2926.79	1462.94	6.	514.	0.257	13.39	2.042

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

Nuclide Name	Nuclide Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	MDA Value pCi/gm	COMMENTS
BE-7		-4.2895E-03					
			477.56	-4.289E-03	&(	3.872E-01	1.10E-01 G
K-40		1.2163E+01					
			1460.75	1.216E+01	(P	3.394E-01	5.43E-01 G
MN-54		5.9404E-03					
			834.81	5.940E-03	%(P	4.377E-02	1.23E-02 G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CO-57	4.8432E-03						
		122.07	4.843E-03	&(	4.758E-02	1.41E-02	G K
		136.43	1.044E-02	%	3.557E-01	1.05E-01	G
CO-60	-7.1649E-03						
		1332.51	-7.165E-03	%(P	4.996E-02	1.38E-02	G K
		1173.23	1.972E-02	&	7.276E-02	2.13E-02	G K
Sr-85	-7.1748E-03						
		514.00	-7.175E-03	&(	4.971E-02	1.45E-02	G
Kr-85	-1.5464E+02						
		513.99	-1.546E+02	&(	1.069E+03	3.11E+02	G
Y-88	-2.1313E-05						
		1836.01	-2.131E-05	%(P	5.465E-02	1.39E-02	G K
		898.02	1.397E-02	% P	5.265E-02	1.53E-02	G
NB-94	-9.2636E-03						
		871.10	-9.264E-03	&(	5.299E-02	1.52E-02	G K
		702.50	2.734E-03	&	3.984E-02	1.12E-02	G K
Ag-108M	-1.5704E-04						
		722.95	-1.570E-04	&(	4.238E-02	1.16E-02	G K
		614.37	-2.449E-02	& P	5.918E-02	1.78E-02	G
		433.93	-5.139E-03	%	3.804E-02	1.10E-02	G
CD-109	-2.0319E-01						
		88.04	-2.032E-01	%(P	1.876E+00	5.59E-01	G
SN-113	4.1455E-04						
		391.71	4.146E-04	&(	5.883E-02	1.69E-02	G K
		255.04	1.039E-01	&	1.634E+00	4.78E-01	G
SB-125	2.1038E-02						
		427.95	2.104E-02	&(P	9.540E-02	2.76E-02	G K
		600.77	4.619E-02	& P	1.950E-01	5.66E-02	G
		636.15	4.919E-02	% P	3.300E-01	9.40E-02	G
		463.51	2.475E-01	% P	3.699E-01	1.14E-01	G
		176.29	8.108E-02	% P	5.286E-01	1.57E-01	G
I-131	-2.2441E-02						
		364.48	-2.244E-02	&(	7.246E-02	2.15E-02	G K
		636.97	1.229E-01	&	8.896E-01	2.53E-01	G
		284.29	1.571E-01	&	8.803E-01	2.59E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CS-134	7.6606E-03						
		604.66	7.661E-03	%(	3.150E-02	9.09E-03	G K
		795.76	7.628E-03	%	5.717E-02	1.63E-02	G
		569.29	7.755E-02	%	2.185E-01	6.48E-02	G
		801.84	5.217E-02	% P	4.193E-01	1.17E-01	G
CS-137	-2.1643E-03						
		661.62	-2.164E-03	%(	4.628E-02	1.29E-02	G
CE-139	6.6711E-03						
		165.85	6.671E-03	&(P	4.523E-02	1.34E-02	G
EU-152	-1.1781E-04						
		121.78	-1.178E-04	&(P	1.092E-01	3.20E-02	G K
		344.30	-1.077E-02	&	1.366E-01	3.98E-02	G
		1408.08	-2.577E-02	%	1.789E-01	4.80E-02	G
		964.00	-3.009E-03	& P	3.881E-01	1.07E-01	G
		1112.07	3.358E-02	%	4.704E-01	1.32E-01	G
		778.90	-2.716E-02	& P	3.495E-01	9.82E-02	G
EU-154	8.6053E-04						
		123.10	8.605E-04	&(P	9.624E-02	2.84E-02	G K
		1274.80	5.965E-03	%	1.677E-01	4.61E-02	G
		723.30	-3.490E-03	& P	1.548E-01	4.11E-02	G
		1004.80	-2.660E-02	&	2.888E-01	8.08E-02	G
EU-155	7.9671E-03						
		86.45	7.967E-03	%(P	2.206E-01	6.56E-02	G K
		105.31	6.365E-03	&	2.200E-01	6.52E-02	G
HG-203	2.3634E-02						
		279.17	2.363E-02	&(P	4.075E-02	1.25E-02	G K
		72.87	-3.832E-01	&	1.264E+00	3.79E-01	G
		70.83	5.154E-01	%	2.858E+00	8.53E-01	G
		82.50	-6.057E-01	&	3.787E+00	1.13E+00	G
TL-208	1.7505E-01						
		583.14	1.751E-01	@(P	4.775E-02	2.24E-02	G
		510.72	3.569E-01	+	1.571E-01	6.71E-02	G
PB-212	3.9503E-01						
		238.63	3.950E-01	@(	8.943E-02	3.36E-02	G K
							Energy duplication
		77.11	5.635E-01	+	5.006E-01	1.56E-01	G
		74.81	4.129E-01	& P	1.052E+00	3.18E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
PB-214	3.6153E-01						
		351.99	3.721E-01	(P	7.805E-02	3.43E-02	G K
		295.22	3.210E-01	(	1.739E-01	5.91E-02	G
							Energy duplication
		77.11	9.217E-01	+	8.187E-01	2.55E-01	G
		241.92	4.132E-01	(	5.160E-01	1.60E-01	G
BI-212	1.8315E-01						
		727.17	1.832E-01	%(	4.075E-01	1.23E-01	G K
		1620.56	5.011E-02	% P	1.728E+00	4.43E-01	G
		785.42	-3.607E-01	% P	2.472E+00	7.08E-01	G
BI-214	3.6096E-01						
		609.32	3.610E-01	@(	7.955E-02	4.13E-02	G K
		1764.51	-1.624E-03	% P	3.142E-01	7.96E-02	G
		1120.28	5.027E-01	+	4.820E-01	1.92E-01	G
RA-224	9.2060E-01						
		241.00	9.206E-01	&(P	9.298E-01	2.92E-01	G
RA-226	1.1351E+00						
		185.99	1.135E+00	*(P	1.022E+00	3.21E-01	G
AC-228	7.9295E-02						
		911.07	-4.157E-02	%(P	1.897E-01	5.48E-02	G K
		968.90	-3.546E-04	% P	3.653E-01	1.02E-01	G
		338.40	3.711E-01	(	3.029E-01	9.84E-02	G
TH-227	-1.6745E-01						
		236.00	-1.674E-01	%(P	3.534E-01	1.07E-01	G K
		256.25	-8.714E-03	%	4.637E-01	1.35E-01	G
PA-234	4.5972E-02						
		98.44	4.597E-02	%(	2.153E-01	6.45E-02	G K
		946.00	-1.694E-02	%	2.311E-01	6.41E-02	G
		131.28	9.084E-02	&	1.613E-01	4.92E-02	G
		94.67	-1.302E-01	%	4.005E-01	1.21E-01	G
		883.24	1.342E-01	%	3.720E-01	1.10E-01	G
		926.70	2.171E-03	&	4.316E-01	1.18E-01	G
		569.26	1.144E-01	%	3.221E-01	9.56E-02	G
TH-234	9.7779E-01						
		63.29	9.778E-01	&(P	3.726E+00	1.12E+00	G K
		92.80	8.898E-01	&	2.035E+00	6.16E-01	G
		92.38	1.030E+00	& P	2.472E+00	7.47E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
AM-241	1.1614E-02						
		59.54	1.161E-02	&(	5.318E-01	1.57E-01	G

(- This peak used in the nuclide activity average.

* - Peak is too wide, but only one peak in library.
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Nuclide Codes:
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Peak Codes:
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- -

***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	-3.9333E-03	-4.2895E-03	3.2882E-01	3.2882E-01	3.550E-01
K-40		1.2163E+01	1.2163E+01	1.6288E+00	1.7660E+00	3.394E-01
MN-54	#A	5.8530E-03	5.9404E-03	3.7026E-02	3.7028E-02	4.313E-02
CO-57	#B	4.7609E-03	4.8432E-03	4.2406E-02	4.2407E-02	4.677E-02
CO-60	#B	-7.1477E-03	-7.1649E-03	4.3579E-02	4.3581E-02	4.984E-02
Sr-85	#A	-6.6804E-03	-7.1748E-03	4.3406E-02	4.3408E-02	4.629E-02
Kr-85	#A	-1.5463E+02	-1.5464E+02	9.3328E+02	9.3332E+02	1.069E+03
Y-88	#B	-2.0407E-05	-2.1313E-05	5.4770E-04	5.4771E-04	5.233E-02
NB-94	#B	-9.2636E-03	-9.2636E-03	4.5738E-02	4.5741E-02	5.299E-02
Ag-108M	#B	-1.5703E-04	-1.5704E-04	3.4862E-02	3.4862E-02	4.238E-02
CD-109	#A	-2.0112E-01	-2.0319E-01	2.0703E+00	2.0703E+00	1.857E+00

SN-113	#B	3.9821E-04	4.1455E-04	5.0554E-02	5.0554E-02	5.651E-02
SB-125	#B	2.0942E-02	2.1038E-02	8.2736E-02	8.2744E-02	9.497E-02
I-131	#B	-1.2618E-02	-2.2441E-02	6.4611E-02	6.4624E-02	4.074E-02
CS-134	#B	7.6137E-03	7.6606E-03	2.7272E-02	2.7276E-02	3.130E-02
CS-137	#A	-2.1634E-03	-2.1643E-03	3.8812E-02	3.8812E-02	4.626E-02
CE-139	#A	6.4502E-03	6.6711E-03	4.0298E-02	4.0299E-02	4.373E-02
EU-152	#B	-1.1769E-04	-1.1781E-04	1.1719E-01	1.1719E-01	1.091E-01
EU-154	#B	8.5925E-04	8.6053E-04	8.5251E-02	8.5251E-02	9.609E-02
EU-155	#B	7.9467E-03	7.9671E-03	1.9670E-01	1.9670E-01	2.200E-01
HG-203	#B	2.1399E-02	2.3634E-02	3.7434E-02	3.7458E-02	3.689E-02
TL-208	#	1.7505E-01	1.7505E-01	6.6942E-02	6.7659E-02	
PB-212	#	3.9503E-01	3.9503E-01	1.0077E-01	1.0318E-01	8.943E-02
PB-214	#	3.6153E-01	3.6153E-01	1.0003E-01	1.0207E-01	7.805E-02
BI-212	#B	1.8315E-01	1.8315E-01	3.6924E-01	3.6939E-01	4.075E-01
BI-214	#	3.6096E-01	3.6096E-01	1.2361E-01	1.2526E-01	
RA-224	#A	9.2060E-01	9.2060E-01	8.7574E-01	8.7726E-01	9.298E-01
RA-226	#	1.1351E+00	1.1351E+00	9.6420E-01	9.6631E-01	1.022E+00
AC-228	B	7.9295E-02	7.9295E-02	6.3056E-02	6.3212E-02	1.897E-01
TH-227	#B	-1.6745E-01	-1.6745E-01	3.2587E-01	3.2601E-01	3.534E-01
PA-234	#B	4.5972E-02	4.5972E-02	1.9343E-01	1.9345E-01	2.153E-01
TH-234	#B	9.7779E-01	9.7779E-01	3.3518E+00	3.3522E+00	3.726E+00
AM-241	#A	1.1614E-02	1.1614E-02	4.7177E-01	4.7177E-01	5.318E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (295.7 to 1999.0 keV) 1.2778275E+01 pCi/gm
Total Decayed Activity (295.7 to 1999.0 keV) 1.2778275E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
DAT

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 102F_27JUL2006_1406.An1

Sample description
FSS-OOL-05-06-017-F

Spectrum Filename: C:\GammaVision\Spectra\102F_27JUL2006_1406.An1

Acquisition information
Start time: 27-Jul-2006 14:06:23
Live time: 2000
Real time: 2015
Dead time: 0.76 %
Detector ID: 3

Detector system
Det 102 - DSPP-468

Calibration
Filename: D2_1LSa.Clb
DET 102 1 Liter Sand Geometry

Energy Calibration
Created: 15-Jan-2005 03:09:29
Zero offset: 0.220 keV
Gain: 0.500 keV/channel
Quadratic: -6.435E-08 keV/channel^2

Efficiency Calibration
Created: 15-Jan-2005 06:48:10
Type: Polynomial
Uncertainty: 0.497 %
Coefficients: -0.294180 -5.980622 0.744607
-0.096737 0.005214 -0.000120

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.22keV)
Stop channel: 4000 (1999.02keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 1.7690E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.7690E+03) =
5.6529E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	24-Jul-2006 20:53:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	102_150K_28APR05.Pbc 01-May-2005 05:27:47
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 9 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.5923

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
76.34	244.	15.95	1.55	9.312E-03	74.81	9.600	2.168E+00	PB212
					77.11	10.700	1.827E+00	PB214
					77.11	17.500	1.117E+00	PB212
86.70	64.	35.43	0.90	1.205E-02				
92.85	92.	39.69	1.83	1.334E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	1.753E+00	TH234
209.80	56.	36.71	0.66	1.517E-02				
239.15	356.	9.88	1.29	1.378E-02	238.63	43.100	4.577E-01	PB212
271.08	44.	38.23	0.89	1.239E-02				
295.91	83.	17.50	1.18	1.144E-02	295.22	19.200	2.880E-01	PB214
338.48	99.	20.60	1.14	1.006E-02	338.40	12.010	6.260E-01	AC228
352.52	118.	14.03	1.17	9.664E-03	351.99	37.100	2.494E-01	PB214
463.75	26.	39.31	1.50	7.365E-03	463.51	10.000	PBC<MDA	SB125
511.54	37.	36.99	1.50	6.695E-03	510.72	22.500	PBC<MDA	TL208
584.14	117.	12.53	1.76	5.880E-03	583.14	86.000	1.761E-01	TL208
610.30	127.	12.82	1.47	5.641E-03	609.32	46.090	3.714E-01	BI214
912.35	60.	17.32	1.27	3.917E-03	911.07	29.000	4.015E-01	AC228
1121.88	30.	31.65	0.92	3.283E-03	1120.28	15.040	4.626E-01	BI214
1463.15	405.	5.01	1.90	2.617E-03	1460.75	10.700	1.103E+01	K40
1767.47	15.	33.40	2.24	2.225E-03	1764.51	15.920	3.197E-01	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
185.28	92.85	475.	92.	0.046	119.06	1.826	PB-214	l

419.22	209.80	162.	56.	0.028	110.14	0.657	NP-239	s
541.81	271.08	93.	44.	0.022	102.89	0.891	AC-228	s

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-214	153.80	77.11	572.	127.	0.064	84.00	1.500D
PB-212	153.80	77.11	572.	127.	0.064	84.00	1.500D
PB-212	477.65	239.01	214.	277.	0.138	28.81	1.500
PB-214	591.30	295.82	102.	91.	0.045	56.67	1.500
AC-228	676.63	338.48	99.	99.	0.049	61.79	1.135
PB-214	704.73	352.52	65.	120.	0.060	39.41	1.500
SB-125	927.24	463.75	48.	26.	0.013	117.94	1.500
TL-208	1022.87	511.54	73.	37.	0.018	110.98	1.499s
TL-208	1168.12	584.14	26.	98.	0.049	37.50	1.499s
BI-214	1220.45	610.30	41.	127.	0.063	38.45	1.472
AC-228	1824.85	912.35	16.	60.	0.030	51.96	1.274
BI-214	2244.16	1121.88	22.	30.	0.015	94.96	0.923s
K-40	2927.20	1463.15	17.	387.	0.193	15.89	2.042
BI-214	3536.40	1767.47	5.	15.	0.007	100.21	2.237s

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	MDA Value pCi/gm	COMMENTS
BE-7		7.9545E-02					
			477.56	7.955E-02	&(	3.306E-01	9.61E-02 G
K-40		1.0535E+01					
			1460.75	1.053E+01	(P	5.904E-01	5.58E-01 G
MN-54		-9.8972E-04					
			834.81	-9.897E-04	&(P	4.631E-02	1.25E-02 G
CO-57		-3.3084E-03					
			122.07	-3.308E-03	%(	4.809E-02	1.42E-02 G K
			136.43	1.147E-01	%	3.495E-01	1.05E-01 G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CO-60	-2.0991E-04						
		1332.51	-2.099E-04	&(P	5.881E-02	1.56E-02	G K
		1173.23	-7.392E-04	%	6.615E-02	1.81E-02	G K
Sr-85	1.2675E-03						
		514.00	1.267E-03	&(	4.771E-02	1.36E-02	G
Kr-85	2.8424E+01						
		513.99	2.842E+01	&(	1.070E+03	3.04E+02	G
Y-88	-3.3717E-03						
		1836.01	-3.372E-03	%(P	4.894E-02	1.24E-02	G K
		898.02	-1.263E-03	% P	6.749E-02	1.86E-02	G
NB-94	-6.5440E-03						
		871.10	-6.544E-03	&(	5.623E-02	1.59E-02	G K
		702.50	8.823E-03	%	4.443E-02	1.28E-02	G K
Ag-108M	3.9833E-05						
		722.95	3.983E-05	%(	4.306E-02	1.16E-02	G K
		614.37	-3.183E-02	% P	6.756E-02	2.04E-02	G
		433.93	-1.256E-03	&	3.445E-02	9.64E-03	G
CD-109	-5.6016E-01						
		88.04	-5.602E-01	&(P	1.661E+00	4.99E-01	G
SN-113	9.2016E-03						
		391.71	9.202E-03	%(	5.235E-02	1.52E-02	G K
		255.04	5.630E-01	%	1.690E+00	5.05E-01	G
SB-125	6.0147E-02						
		427.95	-1.230E-02	%(P	1.072E-01	3.00E-02	G K
		600.77	5.038E-02	% P	2.185E-01	6.32E-02	G
		636.15	4.303E-02	% P	3.380E-01	9.51E-02	G
		463.51	2.746E-01	(P	3.637E-01	1.14E-01	G
		176.29	-1.495E-01	% P	5.540E-01	1.64E-01	G
I-131	-2.0478E-04						
		364.48	-2.048E-04	%(	5.162E-02	1.46E-02	G K
		636.97	9.665E-02	%	6.104E-01	1.72E-01	G
		284.29	-1.429E-02	%	8.438E-01	2.45E-01	G
CS-134	-3.6094E-03						
		604.66	-3.609E-03	%(	4.440E-02	1.25E-02	G K
		795.76	2.374E-02	%	4.896E-02	1.49E-02	G
		569.29	-2.472E-02	%	2.147E-01	6.01E-02	G
		801.84	-1.057E-01	& P	4.798E-01	1.37E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CS-137	9.0731E-04						
		661.62	9.073E-04	&(	4.854E-02	1.34E-02	G
CE-139	1.3207E-02						
		165.85	1.321E-02	%(P	4.040E-02	1.21E-02	G
EU-152	-1.2261E-02						
		121.78	-1.226E-02	%(P	1.408E-01	4.16E-02	G K
		344.30	-4.131E-03	%	1.315E-01	3.77E-02	G
		1408.08	2.931E-02	&	2.363E-01	6.39E-02	G
		964.00	8.494E-02	& P	3.516E-01	1.01E-01	G
		1112.07	8.783E-02	%	4.386E-01	1.25E-01	G
		778.90	-5.720E-02	% P	3.537E-01	1.00E-01	G
EU-154	1.4512E-03						
		123.10	1.451E-03	%(P	9.874E-02	2.91E-02	G K
		1274.80	0.000E+00	&	9.103E-02	2.16E-02	G
		723.30	-3.284E-02	% P	2.184E-01	6.15E-02	G
		1004.80	-4.912E-02	%	2.939E-01	8.29E-02	G
EU-155	7.3957E-03						
		86.45	7.396E-03	%(P	1.642E-01	4.82E-02	G K
		105.31	2.749E-02	%	1.739E-01	5.15E-02	G
HG-203	-2.0562E-05						
		279.17	-2.056E-05	&(P	4.099E-02	1.18E-02	G K
		72.87	-4.257E-01	&	1.840E+00	5.52E-01	G
		70.83	-1.311E+00	%	3.515E+00	1.06E+00	G
		82.50	3.538E-01	&	3.573E+00	1.06E+00	G
TL-208	1.5504E-01						
		583.14	1.471E-01	(P	4.018E-02	1.85E-02	G
		510.72	1.856E-01	&(	2.161E-01	6.86E-02	G
PB-212	3.5504E-01						
		238.63	3.550E-01	(	9.106E-02	3.41E-02	G K
							Energy duplication
		77.11	5.827E-01	+	5.224E-01	1.63E-01	G
		74.81	3.859E-01	& P	1.113E+00	3.35E-01	G
PB-214	2.7545E-01						
		351.99	2.548E-01	(P	8.559E-02	3.36E-02	G K
		295.22	3.154E-01	(	1.727E-01	5.96E-02	G
							Energy duplication
		77.11	9.530E-01	+	8.543E-01	2.67E-01	G
		241.92	6.885E-02	%	6.372E-01	1.89E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
BI-212	-5.4555E-03						
		727.17	-5.456E-03	&(	3.974E-01	1.10E-01	G K
		1620.56	6.252E-01	% P	1.499E+00	4.44E-01	G
		785.42	-3.248E-02	& P	2.227E+00	6.07E-01	G
BI-214	3.7853E-01						
		609.32	3.714E-01	(	9.592E-02	4.77E-02	G K
		1764.51	3.197E-01	?(P	2.839E-01	1.07E-01	G
		1120.28	4.626E-01	(	3.808E-01	1.47E-01	G
RA-224	-1.6587E-02						
		241.00	-1.659E-02	%(P	1.036E+00	3.02E-01	G
RA-226	7.0651E-01						
		185.99	7.065E-01	%(P	1.059E+00	3.24E-01	G
AC-228	4.6720E-01						
		911.07	4.015E-01	(P	1.443E-01	6.99E-02	G K
		968.90	-4.082E-04	& P	3.077E-01	8.37E-02	G
		338.40	6.260E-01	(	3.103E-01	1.29E-01	G
TH-227	-1.6193E-01						
		236.00	-1.619E-01	&(P	3.726E-01	1.13E-01	G K
		256.25	1.646E-01	&	4.844E-01	1.45E-01	G
PA-234	-1.3960E-02						
		98.44	-1.396E-02	%(	1.705E-01	5.03E-02	G K
		946.00	2.038E-02	%	2.476E-01	6.84E-02	G
		131.28	2.041E-02	&	2.027E-01	6.01E-02	G
		94.67	-9.381E-02	%	3.888E-01	1.16E-01	G
		883.24	-1.964E-02	%	4.058E-01	1.12E-01	G
		926.70	-5.260E-02	%	4.242E-01	1.18E-01	G
		569.26	-3.686E-02	%	3.177E-01	8.90E-02	G
TH-234	-8.8766E-02						
		63.29	-8.877E-02	%(P	4.302E+00	1.27E+00	G K
		92.80	1.481E+00	%	2.079E+00	6.38E-01	G
		92.38	1.697E+00	% P	2.399E+00	7.35E-01	G
AM-241	3.4161E-02						
		59.54	3.416E-02	&(	6.253E-01	1.85E-01	G

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- -

***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	7.6788E-02	7.9545E-02	2.8816E-01	2.8819E-01	3.191E-01
K-40		1.0535E+01	1.0535E+01	1.6742E+00	1.7755E+00	5.904E-01
MN-54	#A	-9.8377E-04	-9.8972E-04	8.6035E-02	8.6035E-02	4.603E-02
CO-57	#B	-3.2854E-03	-3.3084E-03	4.2656E-02	4.2656E-02	4.776E-02
CO-60	#B	-2.0971E-04	-2.0991E-04	7.2766E-03	7.2766E-03	5.876E-02
Sr-85	#A	1.2312E-03	1.2675E-03	4.0663E-02	4.0663E-02	4.634E-02
Kr-85	#A	2.8423E+01	2.8424E+01	9.1187E+02	9.1187E+02	1.070E+03
Y-88	#B	-3.3127E-03	-3.3717E-03	3.7590E-02	3.7590E-02	4.808E-02
NB-94	#B	-6.5440E-03	-6.5440E-03	4.7746E-02	4.7748E-02	5.623E-02
Ag-108M	#B	3.9831E-05	3.9833E-05	3.4895E-02	3.4895E-02	4.306E-02
CD-109	#A	-5.5784E-01	-5.6016E-01	1.6322E+00	1.6325E+00	1.654E+00
SN-113	#B	9.0522E-03	9.2016E-03	4.5512E-02	4.5514E-02	5.150E-02
SB-125	#B	6.0035E-02	6.0147E-02	7.5089E-02	7.5165E-02	1.070E-01
I-131	#B	-1.6201E-04	-2.0478E-04	4.3888E-02	4.3888E-02	4.084E-02
CS-134	#B	-3.6004E-03	-3.6094E-03	3.7625E-02	3.7626E-02	4.429E-02
CS-137	#A	9.0715E-04	9.0731E-04	4.0105E-02	4.0105E-02	4.853E-02
CE-139	#A	1.3027E-02	1.3207E-02	3.6305E-02	3.6313E-02	3.985E-02
EU-152	#B	-1.2256E-02	-1.2261E-02	1.5609E-01	1.5609E-01	1.408E-01
EU-154	#B	1.4503E-03	1.4512E-03	8.7209E-02	8.7209E-02	9.868E-02
EU-155	#B	7.3880E-03	7.3957E-03	1.4466E-01	1.4466E-01	1.640E-01

HG-203 #B	-1.9748E-05	-2.0562E-05	6.2030E-02	6.2030E-02	3.936E-02

TL-208	#	1.5504E-01	1.5504E-01	5.8389E-02	5.9034E-02	4.018E-02
PB-212	#	3.5504E-01	3.5504E-01	1.0228E-01	1.0420E-01	9.106E-02
PB-214	#	2.7545E-01	2.7545E-01	9.5161E-02	9.6408E-02	8.559E-02
BI-212	#B	-5.4555E-03	-5.4555E-03	3.2952E-01	3.2952E-01	3.974E-01
BI-214		3.7853E-01	3.7853E-01	1.4553E-01	1.4707E-01	
RA-224	#A	-1.6587E-02	-1.6587E-02	2.1015E+00	2.1015E+00	1.036E+00
RA-226	#A	7.0651E-01	7.0651E-01	9.7272E-01	9.7353E-01	1.059E+00
AC-228		4.6720E-01	4.6720E-01	1.8890E-01	1.9071E-01	
TH-227	#B	-1.6193E-01	-1.6193E-01	3.4351E-01	3.4363E-01	3.726E-01
PA-234	#B	-1.3960E-02	-1.3960E-02	1.5084E-01	1.5084E-01	1.705E-01
TH-234	#B	-8.8766E-02	-8.8766E-02	5.1813E+00	5.1813E+00	4.302E+00
AM-241	#A	3.4160E-02	3.4161E-02	5.5598E-01	5.5598E-01	6.253E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (50.2 to 1999.0 keV) 1.1380644E+01 pCi/gm
Total Decayed Activity (50.2 to 1999.0 keV) 1.1380644E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
DAT

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 102F_27JUL2006_1443.An1

Sample description
FSS-OOL-05-06-001-F

Spectrum Filename: C:\GammaVision\Spectra\102F_27JUL2006_1443.An1

Acquisition information
Start time: 27-Jul-2006 14:43:26
Live time: 2000
Real time: 2017
Dead time: 0.84 %
Detector ID: 3

Detector system
Det 102 - DSPP-468

Calibration
Filename: D2_1LSa.Clb
DET 102 1 Liter Sand Geometry

Energy Calibration
Created: 15-Jan-2005 03:09:29
Zero offset: 0.220 keV
Gain: 0.500 keV/channel
Quadratic: -6.435E-08 keV/channel^2

Efficiency Calibration
Created: 15-Jan-2005 06:48:10
Type: Polynomial
Uncertainty: 0.497 %
Coefficients: -0.294180 -5.980622 0.744607
-0.096737 0.005214 -0.000120

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.22keV)
Stop channel: 4000 (1999.02keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 2.0240E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 2.0240E+03) =
4.9407E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	24-Jul-2006 20:58:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	102_150K_28APR05.Pbc 01-May-2005 05:27:47
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 11 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.6118

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
186.18	66.	38.93	1.50	1.626E-02	185.99	3.280	PBC<MDA	RA226
209.56	70.	36.74	1.35	1.518E-02				
239.09	413.	6.01	1.22	1.379E-02	238.63	43.100	4.637E-01	PB212
242.10	79.	22.71	1.22	1.365E-02	241.00	3.900	PBC<MDA	RA224
					241.92	7.470	5.179E-01	PB214
295.68	120.	12.90	1.25	1.145E-02	295.22	19.200	3.629E-01	PB214
339.15	95.	19.49	1.30	1.004E-02	338.40	12.010	5.228E-01	AC228
					344.30	27.000	2.366E-01	EU152
352.64	216.	10.10	1.05	9.661E-03	351.99	37.100	4.009E-01	PB214
511.86	62.	28.79	1.42	6.680E-03	510.72	22.500	2.730E-01	TL208
584.03	161.	12.25	1.15	5.881E-03	583.14	86.000	2.119E-01	TL208
610.29	124.	12.34	1.50	5.641E-03	609.32	46.090	3.180E-01	BI214
728.09	43.	28.66	0.81	4.789E-03	727.17	11.800	5.110E-01	BI212
912.76	107.	15.35	1.50	3.916E-03	911.07	29.000	6.244E-01	AC228
969.99	78.	15.90	1.71	3.714E-03				
1121.66	26.	33.76	1.82	3.283E-03	1120.28	15.040	PBC<MDA	BI214
1463.19	452.	4.79	1.87	2.617E-03	1460.75	10.700	1.075E+01	K40

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

Peak Centroid Channel	Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
371.97	186.18	242.	66.	0.033	116.79	1.497	PA-234	l
418.74	209.56	229.	70.	0.035	110.21	1.352	AC-228	sM
477.81	239.02	102.	413.	0.207	18.03	1.215	PB-212	D
483.83	242.03	122.	79.	0.040	68.14	1.217	PB-214	D

1940.18	969.99	33.	68.	0.034	50.61	1.707	AC-228	M

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.
M - Peak is close to a library peak.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-212	477.81	239.09	328.	360.	0.180	26.58	1.500
PB-214	591.16	295.75	109.	123.	0.061	45.14	1.500
AC-228	677.48	338.90	89.	84.	0.042	57.56	1.500
PB-214	704.73	352.52	61.	190.	0.095	27.79	1.500
TL-208	1023.50	511.86	74.	62.	0.031	86.38	1.424s
TL-208	1167.89	584.03	56.	161.	0.080	36.75	1.145
BI-214	1220.44	610.29	38.	124.	0.062	37.02	1.501s
BI-212	1456.14	728.09	36.	43.	0.022	85.97	0.809s
AC-228	1825.63	912.74	36.	76.	0.038	47.77	1.679
BI-214	2243.72	1121.66	26.	26.	0.013	101.28	1.819
K-40	2927.31	1463.20	5.	434.	0.217	14.56	2.042

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	Peak MDA Value pCi/gm	COMMENTS
BE-7		-4.0087E-02					
			477.56	-4.009E-02	%(	3.149E-01 8.99E-02	G
K-40		1.0335E+01					
			1460.75	1.034E+01	(P	3.167E-01 5.02E-01	G
MN-54		-3.3845E-04					
			834.81	-3.384E-04	&(P	5.242E-02 1.46E-02	G
CO-57		-8.8960E-03					
			122.07	-8.896E-03	%(	4.646E-02 1.39E-02	G K
			136.43	3.876E-02	%	3.553E-01 1.05E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CO-60	-7.4448E-04						
		1332.51	-7.445E-04	%(P	4.632E-02	1.21E-02	G K
		1173.23	1.558E-02	%	5.795E-02	1.69E-02	G K
Sr-85	-3.2690E-03						
		514.00	-3.269E-03	&(	3.734E-02	1.06E-02	G
Kr-85	-7.1764E+01						
		513.99	-7.176E+01	&(	8.369E+02	2.38E+02	G
Y-88	-3.3735E-03						
		1836.01	-3.373E-03	%(P	4.085E-02	1.03E-02	G K
		898.02	-4.123E-04	& P	4.761E-02	1.28E-02	G
NB-94	0.0000E+00						
		871.10	0.000E+00	%(	4.887E-02	1.35E-02	G K
		702.50	-2.049E-03	%	3.997E-02	1.11E-02	G K
Ag-108M	-1.1418E-02						
		722.95	-1.142E-02	%(	5.565E-02	1.62E-02	G K
		614.37	-1.468E-02	% P	5.334E-02	1.57E-02	G
		433.93	1.071E-02	%	3.690E-02	1.09E-02	G
CD-109	-1.2068E-01						
		88.04	-1.207E-01	%(P	1.846E+00	5.49E-01	G
SN-113	6.9699E-04						
		391.71	6.970E-04	&(	4.901E-02	1.39E-02	G K
		255.04	-4.104E-01	%	1.609E+00	4.79E-01	G
SB-125	3.2315E-02						
		427.95	3.231E-02	%(P	9.598E-02	2.83E-02	G K
		600.77	4.282E-02	& P	2.006E-01	5.80E-02	G
		636.15	7.674E-02	& P	2.577E-01	7.50E-02	G
		463.51	1.545E-01	% P	3.575E-01	1.07E-01	G
		176.29	6.284E-02	& P	5.685E-01	1.68E-01	G
I-131	1.2217E-03						
		364.48	1.222E-03	&(	4.863E-02	1.39E-02	G K
		636.97	1.330E-01	&	6.015E-01	1.73E-01	G
		284.29	7.491E-03	&	6.088E-01	1.75E-01	G
CS-134	-8.1228E-03						
		604.66	-8.123E-03	%(	4.459E-02	1.29E-02	G K
		795.76	2.762E-02	%	4.601E-02	1.43E-02	G
		569.29	5.365E-02	&	1.816E-01	5.30E-02	G
		801.84	-4.571E-02	% P	5.186E-01	1.46E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CS-137	-3.8875E-03						
		661.62	-3.887E-03	%(	4.845E-02	1.37E-02	G
CE-139	3.4129E-03						
		165.85	3.413E-03	%(P	4.425E-02	1.31E-02	G
EU-152	-3.5776E-02						
		121.78	-3.578E-02	%(P	1.328E-01	3.97E-02	G K
		344.30	6.573E-03	%	1.081E-01	3.10E-02	G
		1408.08	-5.356E-02	%	2.581E-01	7.31E-02	G
		964.00	-6.895E-02	% P	3.565E-01	1.02E-01	G
		1112.07	-2.345E-03	%	4.414E-01	1.22E-01	G
		778.90	4.741E-02	% P	3.058E-01	8.66E-02	G
EU-154	-2.2247E-02						
		123.10	-2.225E-02	%(P	9.554E-02	2.86E-02	G K
		1274.80	5.849E-02	%	1.349E-01	4.06E-02	G
		723.30	-5.426E-02	% P	2.584E-01	7.50E-02	G
		1004.80	-4.718E-02	&	3.099E-01	8.82E-02	G
EU-155	5.5395E-02						
		86.45	5.540E-02	&(P	2.172E-01	6.52E-02	G K
		105.31	5.999E-02	%	1.989E-01	5.97E-02	G
HG-203	1.0877E-02						
		279.17	1.088E-02	%(P	3.488E-02	1.04E-02	G K
		72.87	-1.323E-01	%	1.759E+00	5.25E-01	G
		70.83	1.245E+00	&	2.637E+00	7.99E-01	G
		82.50	-7.349E-01	%	3.575E+00	1.07E+00	G
TL-208	2.2461E-01						
		583.14	2.119E-01	(P	4.962E-02	2.61E-02	G
		510.72	2.730E-01	@(	1.902E-01	7.88E-02	G
PB-212	4.0389E-01						
		238.63	4.039E-01	(	9.780E-02	3.58E-02	G K
							Energy duplication
		77.11	3.814E-01	%	5.262E-01	1.61E-01	G
		74.81	5.364E-01	% P	1.045E+00	3.17E-01	G
PB-214	3.5996E-01						
		351.99	3.538E-01	(P	7.274E-02	3.28E-02	G K
		295.22	3.718E-01	(	1.556E-01	5.59E-02	G
							Energy duplication
		77.11	6.238E-01	%	8.606E-01	2.64E-01	G
		241.92	3.225E-01	%	5.898E-01	1.80E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
BI-212	5.1105E-01						
		727.17	5.110E-01	(	3.606E-01	1.47E-01	G K
		1620.56	-1.827E-02	% P	1.445E+00	3.48E-01	G
		785.42	-7.302E-02	% P	2.112E+00	5.84E-01	G
BI-214	3.2648E-01						
		609.32	3.180E-01	@(	8.061E-02	3.93E-02	G K
		1764.51	-1.633E-03	% P	1.389E-01	1.88E-02	G
		1120.28	3.526E-01	&(	3.561E-01	1.19E-01	G
RA-224	6.6120E-01						
		241.00	6.612E-01	&(P	1.131E+00	3.45E-01	G
RA-226	6.7990E-01						
		185.99	6.799E-01	%(P	1.004E+00	3.07E-01	G
AC-228	4.5288E-01						
		911.07	4.474E-01	(P	1.802E-01	7.15E-02	G K
		968.90	9.741E-02	% P	2.901E-01	8.56E-02	G
		338.40	4.661E-01	(	2.576E-01	8.94E-02	G
TH-227	-6.8007E-02						
		236.00	-6.801E-02	%(P	3.738E-01	1.11E-01	G K
		256.25	-1.349E-01	%	4.813E-01	1.43E-01	G
PA-234	-1.3489E-02						
		98.44	-1.349E-02	%(	2.183E-01	6.49E-02	G K
		946.00	-1.031E-03	%	2.356E-01	6.43E-02	G
		131.28	-7.799E-03	&	1.872E-01	5.53E-02	G
		94.67	1.374E-01	&	3.554E-01	1.07E-01	G
		883.24	-3.996E-02	%	3.702E-01	1.04E-01	G
		926.70	-2.511E-02	%	3.163E-01	8.54E-02	G
		569.26	1.513E-02	&	3.140E-01	8.74E-02	G
TH-234	-4.8432E-02						
		63.29	-4.843E-02	&(P	3.574E+00	1.06E+00	G K
		92.80	7.030E-01	%	2.164E+00	6.52E-01	G
		92.38	7.378E-01	% P	2.579E+00	7.76E-01	G
AM-241	-4.8216E-02						
		59.54	-4.822E-02	&(	5.916E-01	1.76E-01	G

(- This peak used in the nuclide activity average.

* - Peak is too wide, but only one peak in library.
! - Peak is part of a multiplet and this area went negative during deconvolution.

? - Peak is too narrow.
@ - Peak is too wide at FW25M, but ok at FWHM.
% - Peak fails sensitivity test.
$ - Peak identified, but first peak of this nuclide failed one or more qualification tests.
+ - Peak activity higher than counting uncertainty range.
- - Peak activity lower than counting uncertainty range.
= - Peak outside analysis energy range.
& - Calculated peak centroid is not close enough to the library energy centroid for positive identification.
P - Peakbackground subtraction
} - Peak is too close to another for the activity to be found directly.

Nuclide Codes:
T - Thermal Neutron Activation
F - Fast Neutron Activation
I - Fission Product
N - Naturally Occurring Isotope
P - Photon Reaction
C - Charged Particle Reaction
M - No MDA Calculation
R - Coincidence Corrected
H - Halflife limit exceeded

Peak Codes:
G - Gamma Ray
X - X-Ray
P - Positron Decay
S - Single-Escape
D - Double-Escape
K - Key Line
A - Not in Average
C - Coincidence Peak

- -

***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	-3.8687E-02	-4.0087E-02	2.6984E-01	2.6985E-01	3.039E-01
K-40		1.0335E+01	1.0335E+01	1.5055E+00	1.6134E+00	3.167E-01
MN-54	#A	-3.3640E-04	-3.3845E-04	1.8644E-02	1.8644E-02	5.210E-02
CO-57	#B	-8.8337E-03	-8.8960E-03	4.1600E-02	4.1603E-02	4.614E-02
CO-60	#B	-7.4374E-04	-7.4448E-04	6.0218E-02	6.0218E-02	4.627E-02
Sr-85	#A	-3.1747E-03	-3.2690E-03	3.1913E-02	3.1913E-02	3.626E-02
Kr-85	#A	-7.1763E+01	-7.1764E+01	7.1499E+02	7.1500E+02	8.369E+02
Y-88	#B	-3.3139E-03	-3.3735E-03	3.1291E-02	3.1292E-02	4.012E-02
NB-94	#B	0.0000E+00	0.0000E+00	4.0451E-02	4.0451E-02	4.887E-02
Ag-108M	#B	-1.1418E-02	-1.1418E-02	4.8540E-02	4.8544E-02	5.565E-02
CD-109	#A	-1.2018E-01	-1.2068E-01	2.3522E+00	2.3522E+00	1.838E+00
SN-113	#B	6.8558E-04	6.9699E-04	4.1716E-02	4.1716E-02	4.821E-02
SB-125	#B	3.2254E-02	3.2315E-02	8.4938E-02	8.4957E-02	9.580E-02
I-131	#B	9.6467E-04	1.2217E-03	4.1674E-02	4.1674E-02	3.840E-02
CS-134	#B	-8.1024E-03	-8.1228E-03	3.8774E-02	3.8776E-02	4.447E-02
CS-137	#A	-3.8868E-03	-3.8875E-03	4.1038E-02	4.1039E-02	4.844E-02
CE-139	#A	3.3661E-03	3.4129E-03	3.9246E-02	3.9246E-02	4.365E-02
EU-152	#B	-3.5762E-02	-3.5776E-02	1.2741E-01	1.2743E-01	1.327E-01
EU-154	#B	-2.2233E-02	-2.2247E-02	8.7247E-02	8.7256E-02	9.548E-02
EU-155	#B	5.5337E-02	5.5395E-02	1.9550E-01	1.9553E-01	2.170E-01

HG-203 #B	1.0443E-02	1.0877E-02	3.1138E-02	3.1144E-02	3.349E-02

TL-208		2.2461E-01	2.2461E-01	8.2757E-02	8.3711E-02	
PB-212	#	4.0389E-01	4.0389E-01	1.0734E-01	1.0971E-01	9.780E-02
PB-214	#	3.5996E-01	3.5996E-01	9.5461E-02	9.7575E-02	7.274E-02
BI-212		5.1105E-01	5.1105E-01	4.3935E-01	4.4029E-01	
BI-214		3.2648E-01	3.2648E-01	1.2088E-01	1.2226E-01	
RA-224	#A	6.6120E-01	6.6120E-01	1.0346E+00	1.0352E+00	1.131E+00
RA-226	#A	6.7990E-01	6.7990E-01	9.2204E-01	9.2283E-01	1.004E+00
AC-228		4.5288E-01	4.5288E-01	1.6958E-01	1.7147E-01	1.802E-01
TH-227	#B	-6.8007E-02	-6.8007E-02	3.4565E-01	3.4567E-01	3.738E-01
PA-234	#B	-1.3489E-02	-1.3489E-02	1.9472E-01	1.9472E-01	2.183E-01
TH-234	#B	-4.8432E-02	-4.8432E-02	5.1929E+00	5.1929E+00	3.574E+00
AM-241	#A	-4.8215E-02	-4.8216E-02	5.2769E-01	5.2770E-01	5.916E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (295.7 to 1999.0 keV) 1.1850024E+01 pCi/gm
Total Decayed Activity (295.7 to 1999.0 keV) 1.1850024E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
DAT

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 103_25JULY2006_0938.An1

Sample description
OOL-05-06-019-F-S WET

Spectrum Filename: C:\GammaVision\Spectra\103_25JULY2006_0938.An1

Acquisition information
Start time: 25-Jul-2006 09:39:35
Live time: 2000
Real time: 2002
Dead time: 0.09 %
Detector ID: 4

Detector system
Det 103 - DSPE-471

Calibration
Filename: D3_1LSa.Clb
Detector_103 1.0 Liter Sand Geometry

Energy Calibration
Created: 08-Aug-2005 11:09:41
Zero offset: 0.409 keV
Gain: 0.500 keV/channel
Quadratic: 1.092E-08 keV/channel^2

Efficiency Calibration
Created: 08-Aug-2005 11:11:25
Type: Polynomial
Uncertainty: 0.993 %
Coefficients: -0.264059 -5.138468 0.638383
-0.089199 0.005011 -0.000129

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.41keV)
Stop channel: 4000 (2000.67keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 1.6840E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.6840E+03) =
5.9382E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	24-Jul-2006 20:45:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	103_150K_05AUG05.Pbc 08-Aug-2005 12:54:15
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 18 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.1135

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
74.94	98.	23.97	0.99	9.052E-03	72.87	6.400	PBC<MDA	HG203
					74.81	9.600	9.022E-01	PB212
77.24	130.	15.35	0.99	1.011E-02	77.11	17.500	7.049E-01	PB212
					77.11	10.700	1.153E+00	PB214
128.59	95.	34.84	1.17	2.432E-02				
186.26	126.	23.94	1.61	2.566E-02	185.99	3.280	1.076E+00	RA226
238.92	771.	4.35	1.09	2.318E-02	238.63	43.100	6.092E-01	PB212
241.95	108.	21.50	1.10	2.302E-02	241.00	3.900	9.655E-01	RA224
					241.92	7.470	5.052E-01	PB214
270.41	76.	25.85	1.02	2.150E-02				
277.23	76.	32.36	1.10	2.115E-02				
295.31	199.	10.11	1.13	2.025E-02	295.22	19.200	4.030E-01	PB214
328.48	40.	40.62	0.98	1.872E-02				
338.61	151.	16.86	1.03	1.829E-02	338.40	12.010	5.458E-01	AC228
351.92	300.	9.27	1.22	1.776E-02	351.99	37.100	3.585E-01	PB214
462.65	59.	27.70	1.43	1.427E-02				
462.65	59.	27.70	1.43	1.427E-02	463.51	10.000	3.230E-01	SB125
511.03	152.	17.97	1.40	1.317E-02	510.72	22.500	3.399E-01	TL208
583.07	236.	9.14	1.31	1.185E-02	583.14	86.000	1.825E-01	TL208
609.38	271.	9.79	1.48	1.144E-02	609.32	46.090	4.025E-01	BI214
727.53	57.	21.64	1.21	9.961E-03	727.17	11.800	3.849E-01	BI212
785.17	41.	36.67	1.35	9.396E-03				
785.17	41.	36.67	1.35	9.396E-03	785.42	2.000	1.743E+00	BI212
795.48	55.	24.25	0.91	9.304E-03				
795.48	55.	24.25	0.91	9.304E-03	795.76	85.400	5.510E-02	CS134
860.35	56.	33.01	1.00	8.769E-03				
911.38	196.	11.14	1.75	8.399E-03	911.07	29.000	6.361E-01	AC228

964.85	37.	24.34	1.54	8.051E-03	964.00	14.580	2.506E-01	EU152
968.98	119.	10.79	1.54	8.025E-03	968.90	17.460	6.806E-01	AC228
1120.56	83.	22.19	2.07	7.212E-03	1120.28	15.040	6.134E-01	BI214
1460.86	1176.	3.09	1.82	5.932E-03	1460.75	10.700	1.463E+01	K40
1764.60	54.	13.61	1.81	5.142E-03	1764.51	15.920	4.973E-01	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide
256.35	128.59	395.	137.	0.069	66.64	1.165	AC-228 s
539.98	270.41	155.	76.	0.038	77.55	1.021	AC-228
553.62	277.23	194.	90.	0.045	72.87	1.096	TL-208 s
656.10	328.48	112.	40.	0.020	121.86	0.982	RH-106M
1569.39	785.17	57.	41.	0.020	110.01	1.352	BI-212 l
1719.74	860.35	81.	56.	0.028	78.46	1.001	TL-208 s
1928.92	964.89	22.	38.	0.019	71.88	1.538	AC-228 D

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-212	148.79	74.81	245.	98.	0.049	71.92	0.993D
PB-212	153.39	77.11	237.	130.	0.065	46.06	0.995A
RA-226	371.86	186.35	538.	108.	0.054	85.16	1.500s
PB-212	476.98	238.91	480.	734.	0.367	17.60	0.881
RA-224	482.71	241.78	546.	96.	0.048	107.85	1.500
PB-214	589.53	295.19	180.	189.	0.094	37.53	1.085
AC-228	676.36	338.61	177.	150.	0.075	50.57	1.028
PB-214	702.98	351.92	181.	294.	0.147	27.81	1.224
SB-125	924.63	462.76	96.	55.	0.027	83.72	1.500s
TL-208	1021.16	511.03	183.	126.	0.063	53.91	1.396s
TL-208	1165.24	583.07	92.	232.	0.116	27.41	1.310
BI-214	1217.87	609.38	138.	264.	0.132	29.37	1.482
BI-212	1455.85	728.39	57.	83.	0.041	56.95	1.246s
CS-134	1589.13	795.03	41.	45.	0.023	74.60	1.500s
AC-228	1821.80	911.38	76.	193.	0.097	33.42	1.753
EU-152	1928.97	964.98	47.	29.	0.014	112.87	1.538s
AC-228	1936.81	968.90	23.	119.	0.059	32.37	1.541D
BI-214	2240.09	1120.56	81.	83.	0.041	66.57	2.075s
K-40	2920.59	1460.86	49.	1157.	0.578	9.28	1.823
BI-214	3527.32	1764.28	5.	32.	0.016	52.55	2.033

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	Peak MDA Value pCi/gm	COMMENTS
BE-7		-1.6737E-02					
			477.56	-1.674E-02	&(	3.142E-01 9.12E-02	G
K-40		1.4626E+01					
			1460.75	1.463E+01	(P	4.472E-01 4.60E-01	G
MN-54		9.5941E-03					
			834.81	9.594E-03	%(P	3.710E-02 1.09E-02	G
CO-57		3.9375E-03					
			122.07	3.938E-03	&(P	4.761E-02 1.42E-02	G K
			136.43	6.097E-02	&	3.660E-01 1.09E-01	G
CO-60		3.4541E-03					
			1332.51	3.454E-03	%(P	3.322E-02 9.05E-03	G K
			1173.23	1.046E-02	% P	4.641E-02 1.35E-02	G K
Sr-85		-1.1862E-02					
			514.00	-1.186E-02	%(	4.229E-02 1.26E-02	G
Kr-85		-2.7242E+02					
			513.99	-2.724E+02	%(	9.708E+02 2.90E+02	G
Y-88		-7.9359E-04					
			1836.01	-7.936E-04	&(P	3.246E-02 8.56E-03	G K
			898.02	1.570E-02	% P	3.120E-02 9.48E-03	G
NB-94		4.1557E-03					
			871.10	4.156E-03	%(	3.200E-02 9.16E-03	G K
			702.50	0.000E+00	&	3.928E-02 1.13E-02	G K
Ag-108M		-9.4299E-04					
			722.95	-9.430E-04	%(	6.176E-02 1.80E-02	G K
			614.37	-1.775E-03	% P	4.100E-02 1.18E-02	G
			433.93	-6.417E-03	&	3.128E-02 9.21E-03	G
CD-109		6.5208E-01					
			88.04	6.521E-01	%(	1.779E+00 5.37E-01	G
SN-113		6.9066E-03					
			391.71	6.907E-03	%(	4.741E-02 1.39E-02	G K
			255.04	2.023E-01	&	1.528E+00 4.53E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	8.0179E-02						
		427.95	2.625E-03	%(P	9.771E-02	2.83E-02	G K
		600.77	2.977E-02	% P	1.895E-01	5.54E-02	G
		636.15	7.144E-02	% P	2.084E-01	6.16E-02	G
		463.51	3.097E-01	@(P	2.730E-01	8.84E-02	G
		176.29	-3.795E-02	%	5.443E-01	1.62E-01	G
I-131	-1.7399E-03						
		364.48	-1.740E-03	%(P	3.690E-02	1.07E-02	G K
		636.97	9.410E-02	%	4.018E-01	1.18E-01	G
		284.29	-1.846E-03	& P	5.635E-01	1.65E-01	G
CS-134	2.2569E-02						
		604.66	2.282E-03	&(	7.526E-02	2.23E-02	G K
		795.76	4.575E-02	@(P	3.290E-02	1.14E-02	G
		569.29	3.693E-02	& P	1.980E-01	5.77E-02	G
		801.84	6.097E-02	% P	3.744E-01	1.08E-01	G
CS-137	-1.8781E-03						
		661.62	-1.878E-03	%(P	3.997E-02	1.13E-02	G
CE-139	8.1920E-03						
		165.85	8.192E-03	&(	4.472E-02	1.34E-02	G
EU-152	7.2586E-02						
		121.78	1.078E-02	%(P	1.354E-01	4.03E-02	G K
		344.30	-3.168E-02	% P	1.151E-01	3.43E-02	G
		1408.08	7.805E-03	%	1.556E-01	4.27E-02	G
		964.00	1.965E-01	(P	2.361E-01	7.53E-02	G
		1112.07	8.968E-02	&	3.319E-01	9.78E-02	G
		778.90	0.000E+00	%	3.329E-01	9.57E-02	G
EU-154	-5.2753E-03						
		123.10	-5.275E-03	&(	9.880E-02	2.94E-02	G K
		1274.80	4.990E-02	%	1.048E-01	3.18E-02	G
		723.30	5.098E-04	%	1.455E-01	4.08E-02	G
		1004.80	4.547E-02	%	1.623E-01	4.73E-02	G
EU-155	-2.6726E-02						
		86.45	-2.673E-02	%(	2.221E-01	6.63E-02	G K
		105.31	5.037E-02	%	2.153E-01	6.46E-02	G
HG-203	-8.9862E-03						
		279.17	-8.986E-03	%(P	4.078E-02	1.22E-02	G K
		72.87	-1.446E-02	% P	2.014E+00	5.98E-01	G
		70.83	-5.972E-01	%	3.866E+00	1.16E+00	G
		82.50	0.000E+00	%	3.629E+00	1.08E+00	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	1.8252E-01						
		583.14	1.825E-01	(P	3.740E-02	1.70E-02	G
		510.72	3.399E-01	+ P	1.782E-01	7.41E-02	G
PB-212	5.8912E-01						
		238.63	5.891E-01	(P	8.411E-02	3.52E-02	G K
							Energy duplication
		77.11	5.891E-01	} P	3.372E-01	9.05E-02	G
		74.81	9.022E-01	+ P	6.982E-01	2.23E-01	G
PB-214	3.6898E-01						
		351.99	3.585E-01	(P	7.963E-02	3.39E-02	G K
		295.22	3.892E-01	(P	1.348E-01	4.97E-02	G
							Energy duplication
		77.11	0.000E+00	} P	7.784E-01	0.00E+00	G
		241.92	3.126E-01	%	5.345E-01	1.63E-01	G
BI-212	5.6307E-01						
		727.17	5.631E-01	@(P	2.596E-01	1.08E-01	G K
		1620.56	2.092E-01	% P	9.148E-01	2.56E-01	G
		785.42	6.689E-01	%	1.483E+00	4.48E-01	G
BI-214	4.0247E-01						
		609.32	4.025E-01	(P	8.732E-02	4.04E-02	G K
		1764.51	3.173E-01	- P	1.281E-01	6.12E-02	G
		1120.28	6.134E-01	+ P	3.305E-01	1.39E-01	G
RA-224	8.5513E-01						
		241.00	8.551E-01	&(	9.954E-01	3.07E-01	G
RA-226	1.0250E+00						
		185.99	1.025E+00	(P	1.056E+00	3.26E-01	G
AC-228	6.3089E-01						
		911.07	6.361E-01	(P	1.426E-01	7.21E-02	G K
		968.90	6.807E-01	(P	1.437E-01	7.35E-02	G
		338.40	5.458E-01	(P	2.366E-01	9.27E-02	G
TH-227	-9.1409E-02						
		236.00	-9.141E-02	%(	3.435E-01	1.03E-01	G K
		256.25	7.918E-02	& P	4.604E-01	1.37E-01	G
PA-234	-1.8385E-02						
		98.44	-1.839E-02	%(P	2.160E-01	6.43E-02	G K
		946.00	2.021E-02	& P	1.690E-01	4.83E-02	G
		131.28	-8.395E-02	% P	2.119E-01	6.40E-02	G
		94.67	2.415E-01	% P	3.421E-01	1.05E-01	G
		883.24	1.243E-01	%	2.194E-01	6.77E-02	G
		926.70	-2.953E-02	%	3.132E-01	8.93E-02	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26 5.464E-02 & P 2.937E-01 8.55E-02 G

TH-234       1.9447E+00
                           63.29 1.945E+00 &(P 6.209E+00 1.86E+00 G K
                           92.80 1.041E+00 % P 2.106E+00 6.35E-01 G
                           92.38 1.182E+00 & P 2.510E+00 7.57E-01 G

AM-241      -2.4078E-01
                           59.54-2.408E-01 &(P 1.069E+00 3.20E-01 G
   ( - This peak used in the nuclide activity average.

   * - Peak is too wide, but only one peak in library.
   ! - Peak is part of a multiplet and this area went
       negative during deconvolution.
   ? - Peak is too narrow.
   @ - Peak is too wide at FW25M, but ok at FWHM.
   % - Peak fails sensitivity test.
   $ - Peak identified, but first peak of this nuclide
       failed one or more qualification tests.
   + - Peak activity higher than counting uncertainty range.
   - - Peak activity lower than counting uncertainty range.
   = - Peak outside analysis energy range.
   & - Calculated peak centroid is not close enough to the
       library energy centroid for positive identification.
   P - Peakbackground subtraction
   } - Peak is too close to another for the activity
       to be found directly.

   Nuclide Codes:                      Peak Codes:
   T - Thermal Neutron Activation      G - Gamma Ray
   F - Fast Neutron Activation         X - X-Ray
   I - Fission Product                 P - Positron Decay
   N - Naturally Occurring Isotope     S - Single-Escape
   P - Photon Reaction                 D - Double-Escape
   C - Charged Particle Reaction       K - Key Line
   M - No MDA Calculation              A - Not in Average
   R - Coincidence Corrected           C - Coincidence Peak
   H - Halflife limit exceeded

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***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	-1.6621E-02	-1.6737E-02	2.7372E-01	2.7372E-01	3.120E-01
K-40		1.4626E+01	1.4626E+01	1.3788E+00	1.6193E+00	
MN-54	#A	9.5826E-03	9.5941E-03	3.2731E-02	3.2736E-02	3.706E-02
CO-57	#B	3.9321E-03	3.9375E-03	4.2522E-02	4.2523E-02	4.755E-02
CO-60	#B	3.4535E-03	3.4541E-03	2.7147E-02	2.7147E-02	3.321E-02

Sr-85	#A	-1.1794E-02	-1.1862E-02	3.7860E-02	3.7866E-02	4.205E-02
Kr-85	#A	-2.7242E+02	-2.7242E+02	8.6902E+02	8.6916E+02	9.708E+02
Y-88	#B	-7.9082E-04	-7.9359E-04	3.3289E-02	3.3289E-02	3.235E-02
NB-94	#B	4.1557E-03	4.1557E-03	2.7489E-02	2.7490E-02	3.200E-02
Ag-108M	#B	-9.4298E-04	-9.4299E-04	5.4109E-02	5.4109E-02	6.176E-02
CD-109	#A	6.5154E-01	6.5208E-01	1.6109E+00	1.6113E+00	1.778E+00
SN-113	#B	6.8843E-03	6.9066E-03	4.1842E-02	4.1843E-02	4.726E-02
SB-125	#B	8.0149E-02	8.0179E-02	6.8681E-02	6.8838E-02	9.767E-02
I-131	#B	-1.6610E-03	-1.7399E-03	5.1972E-02	5.1972E-02	3.522E-02
CS-134	#B	2.2558E-02	2.2569E-02	1.6870E-02	1.6920E-02	7.522E-02
CS-137	#A	-1.8780E-03	-1.8781E-03	1.6231E-01	1.6231E-01	3.997E-02
CE-139	#A	8.1698E-03	8.1920E-03	4.0117E-02	4.0120E-02	4.460E-02
EU-152	#B	7.2581E-02	7.2586E-02	8.3477E-02	8.3574E-02	1.354E-01
EU-154	#B	-5.2747E-03	-5.2753E-03	8.8109E-02	8.8110E-02	9.879E-02
EU-155	#B	-2.6720E-02	-2.6726E-02	1.9895E-01	1.9896E-01	2.220E-01
HG-203	#B	-8.9146E-03	-8.9862E-03	3.6636E-02	3.6640E-02	4.046E-02
TL-208		1.8252E-01	1.8252E-01	5.0951E-02	5.2042E-02	
PB-212		5.8912E-01	5.8912E-01	1.0539E-01	1.1080E-01	
PB-214		3.6898E-01	3.6898E-01	8.7961E-02	9.0532E-02	
BI-212	#	5.6307E-01	5.6307E-01	3.2262E-01	3.2427E-01	
BI-214		4.0247E-01	4.0247E-01	1.2111E-01	1.2334E-01	
RA-224	#A	8.5513E-01	8.5513E-01	9.2227E-01	9.2360E-01	9.954E-01
RA-226	#A	1.0250E+00	1.0250E+00	9.7813E-01	9.7994E-01	1.056E+00
AC-228		6.3089E-01	6.3089E-01	1.4572E-01	1.5026E-01	
TH-227	#B	-9.1409E-02	-9.1409E-02	3.0931E-01	3.0936E-01	3.435E-01
PA-234	#B	-1.8385E-02	-1.8385E-02	2.3299E-01	2.3300E-01	2.160E-01
TH-234	#B	1.9447E+00	1.9447E+00	5.5912E+00	5.5922E+00	6.209E+00
AM-241	#A	-2.4078E-01	-2.4078E-01	9.7538E-01	9.7547E-01	1.069E+00

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (1120.0 to 2000.7 keV) 1.7363150E+01 pCi/gm
Total Decayed Activity (1120.0 to 2000.7 keV) 1.7363150E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JPK

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 103F_26JUL2006_1939.An1

Sample description
FSS-OOL-05-06-003-F

Spectrum Filename: C:\GammaVision\Spectra\103F_26JUL2006_1939.An1

Acquisition information
Start time: 26-Jul-2006 19:39:29
Live time: 2000
Real time: 2001
Dead time: 0.07 %
Detector ID: 4

Detector system
Det 103 - DSPE-471

Calibration
Filename: D3_1LSa.Clb
Detector_103 1.0 Liter Sand Geometry

Energy Calibration
Created: 08-Aug-2005 11:09:41
Zero offset: 0.409 keV
Gain: 0.500 keV/channel
Quadratic: 1.092E-08 keV/channel^2

Efficiency Calibration
Created: 08-Aug-2005 11:11:25
Type: Polynomial
Uncertainty: 0.993 %
Coefficients: -0.264059 -5.138468 0.638383
-0.089199 0.005011 -0.000129

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.41keV)
Stop channel: 4000 (2000.67keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 2.0010E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 2.0010E+03) =
4.9975E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	24-Jul-2006 20:48:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	103_150K_05AUG05.Pbc 08-Aug-2005 12:54:15
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 13 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.1386

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
74.96	59.	35.86	0.99	9.052E-03	74.81	9.600	PBC<MDA	PB212
77.26	110.	18.83	0.99	1.011E-02	77.11	10.700	7.009E-01	PB214
					77.11	17.500	4.285E-01	PB212
186.07	101.	30.86	1.21	2.566E-02	185.99	3.280	PBC<MDA	RA226
238.93	558.	5.38	1.09	2.318E-02	236.00	11.200	1.442E+00	TH227
					238.63	43.100	3.688E-01	PB212
241.99	95.	22.99	1.10	2.302E-02	241.00	3.900	7.145E-01	RA224
					241.92	7.470	3.738E-01	PB214
295.11	160.	14.83	1.17	2.025E-02	295.22	19.200	2.709E-01	PB214
327.77	41.	39.96	1.34	1.875E-02				
338.56	139.	16.33	1.15	1.829E-02	338.40	12.010	4.249E-01	AC228
351.96	290.	9.32	0.94	1.775E-02	351.99	37.100	2.916E-01	PB214
463.23	74.	22.40	1.64	1.425E-02				
463.23	74.	22.40	1.64	1.425E-02	463.51	10.000	3.462E-01	SB125
477.80	34.	39.37	1.50	1.391E-02	477.56	10.300	PBC<MDA	BE7
511.10	114.	17.85	2.07	1.316E-02	510.72	22.500	1.999E-01	TL208
583.23	191.	11.98	1.22	1.184E-02	583.14	86.000	1.238E-01	TL208
609.27	207.	9.87	1.33	1.144E-02	609.32	46.090	2.569E-01	BI214
727.36	52.	20.75	2.01	9.963E-03	727.17	11.800	2.981E-01	BI212
795.15	69.	26.05	1.12	9.307E-03				
911.58	144.	12.26	2.04	8.398E-03	911.07	29.000	3.884E-01	AC228
969.02	140.	14.70	1.60	8.025E-03	968.90	17.460	6.740E-01	AC228
1120.77	58.	26.53	1.97	7.212E-03	1120.28	15.040	3.587E-01	BI214
1461.17	894.	3.47	1.98	5.931E-03	1460.75	10.700	9.313E+00	K40
1764.88	48.	16.14	1.11	5.141E-03	1764.51	15.920	3.690E-01	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide
654.68	327.77	109.	41.	0.021	119.89	1.337	AC-228
1589.35	795.15	62.	69.	0.034	60.81	1.125	AC-228

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-212	148.79	74.81	220.	59.	0.030	107.57	0.993D
PB-212	153.39	77.11	205.	110.	0.055	56.48	0.995A
RA-226	371.84	186.34	463.	84.	0.042	97.47	1.500
PB-212	477.04	238.94	458.	614.	0.307	21.02	0.853
RA-224	482.83	241.84	472.	93.	0.047	103.47	1.500s
PB-214	482.85	241.84	437.	85.	0.043	109.08	1.500s
PB-214	589.37	295.11	172.	156.	0.078	44.50	1.167s
AC-228	676.27	338.56	147.	138.	0.069	48.98	1.152
PB-214	703.05	351.96	158.	284.	0.142	27.97	0.935
SB-125	925.41	463.14	58.	58.	0.029	66.43	1.500s
BE-7	954.71	477.80	75.	34.	0.017	118.12	1.500s
TL-208	1021.32	511.10	121.	88.	0.044	53.56	2.074s
TL-208	1165.56	583.23	99.	187.	0.093	35.94	1.221
BI-214	1217.63	609.27	76.	201.	0.100	29.60	1.333
BI-212	1453.79	727.36	29.	52.	0.026	62.24	2.012s
AC-228	1822.19	911.58	51.	140.	0.070	36.79	2.038s
AC-228	1937.05	969.02	66.	140.	0.070	44.11	1.604s
BI-214	2240.51	1120.77	59.	58.	0.029	79.60	1.972s
K-40	2921.20	1461.17	35.	875.	0.438	10.40	1.976
BI-214	3528.51	1764.88	6.	45.	0.022	48.41	1.107s

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	Peak MDA Value pCi/gm	COMMENTS
BE-7		1.6662E-01					
			477.56	1.666E-01	*(	2.080E-01 6.56E-02	G
K-40		9.3129E+00					
			1460.75	9.313E+00	(P	3.210E-01 3.30E-01	G
MN-54		-2.2543E-03					
			834.81	-2.254E-03	%(P	2.752E-02 7.80E-03	G
CO-57		-1.4575E-04					
			122.07	-1.458E-04	%(P	3.865E-02 1.14E-02	G K
			136.43	4.367E-02	&	2.916E-01 8.71E-02	G
CO-60		-3.1202E-04					
			1332.51	-3.120E-04	&(P	3.130E-02 8.43E-03	G K
			1173.23	-9.173E-04	% P	3.651E-02 1.01E-02	G K
Sr-85		-6.1648E-03					
			514.00	-6.165E-03	%(	3.091E-02 9.13E-03	G
Kr-85		-1.3949E+02					
			513.99	-1.395E+02	%(	6.989E+02 2.06E+02	G
Y-88		1.2889E-03					
			1836.01	1.289E-03	&(P	2.213E-02 5.73E-03	G K
			898.02	-5.412E-04	% P	3.736E-02 1.06E-02	G
NB-94		0.0000E+00					
			871.10	0.000E+00	%(	3.269E-02 9.28E-03	G K
			702.50	-8.542E-04	%	2.637E-02 7.50E-03	G K
Ag-108M		-2.4416E-03					
			722.95	-2.442E-03	%(	2.052E-02 5.77E-03	G K
			614.37	-1.402E-02	& P	2.963E-02 8.97E-03	G
			433.93	-5.029E-05	%	2.442E-02 7.00E-03	G
CD-109		-1.2923E-02					
			88.04	-1.292E-02	%(	1.501E+00 4.46E-01	G
SN-113		2.8151E-03					
			391.71	2.815E-03	&(	3.344E-02 9.71E-03	G K
			255.04	7.839E-02	&	1.175E+00 3.46E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	7.1920E-02						
		427.95	2.747E-03	&(P	6.163E-02	1.76E-02	G K
		600.77	-1.870E-02	% P	1.338E-01	3.88E-02	G
		636.15	-2.151E-02	% P	1.896E-01	5.37E-02	G
		463.51	2.767E-01	(P	1.820E-01	6.26E-02	G
		176.29	-7.092E-03	&	3.551E-01	1.04E-01	G
I-131	-1.7178E-03						
		364.48	-1.718E-03	%(P	3.359E-02	9.74E-03	G K
		636.97	7.163E-02	%	3.152E-01	9.15E-02	G
		284.29	7.432E-02	% P	4.688E-01	1.39E-01	G
CS-134	-3.5861E-03						
		604.66	-3.586E-03	&(	2.443E-02	7.07E-03	G K
		795.76	2.612E-04	% P	3.177E-02	8.95E-03	G
		569.29	3.515E-02	% P	1.403E-01	4.09E-02	G
		801.84	-5.419E-02	% P	2.871E-01	8.09E-02	G
CS-137	1.1985E-03						
		661.62	1.198E-03	%(P	3.252E-02	9.27E-03	G
CE-139	7.6338E-03						
		165.85	7.634E-03	%(	3.301E-02	9.88E-03	G
EU-152	-9.4259E-04						
		121.78	-9.426E-04	%(P	1.097E-01	3.25E-02	G K
		344.30	-7.253E-03	% P	8.520E-02	2.49E-02	G
		1408.08	4.599E-02	%	1.075E-01	3.23E-02	G
		964.00	-2.018E-02	% P	1.835E-01	5.16E-02	G
		1112.07	1.131E-01	&	2.037E-01	6.27E-02	G
		778.90	-2.108E-02	%	1.930E-01	5.51E-02	G
EU-154	-1.0951E-02						
		123.10	-1.095E-02	&(	8.281E-02	2.47E-02	G K
		1274.80	-7.312E-03	%	6.306E-02	1.74E-02	G
		723.30	0.000E+00	%	2.174E-01	6.32E-02	G
		1004.80	8.642E-03	&	1.475E-01	4.12E-02	G
EU-155	7.0875E-02						
		86.45	7.088E-02	%(	1.660E-01	5.02E-02	G K
		105.31	5.832E-02	%	1.638E-01	4.94E-02	G
HG-203	1.3174E-02						
		279.17	1.317E-02	&(P	2.713E-02	8.23E-03	G K
		72.87	-4.459E-01	% P	1.563E+00	4.69E-01	G
		70.83	-1.057E+00	&	3.239E+00	9.75E-01	G
		82.50	7.935E-02	&	2.908E+00	8.63E-01	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments

TL-208       1.2377E-01
                          583.14 1.238E-01  (P 3.258E-02 1.52E-02 G
                          510.72 1.999E-01 + P 1.231E-01 4.66E-02 G

PB-212       4.2397E-01
                          238.63 4.144E-01  (P 6.922E-02 2.96E-02 G K
                                                          Energy duplication
                           77.11 4.184E-01 } P 2.648E-01 7.88E-02 G
                           74.81 4.586E-01  (P 5.582E-01 1.73E-01 G

PB-214       2.9037E-01
                          351.99 2.916E-01  (P 6.277E-02 2.77E-02 G K
                          295.22 2.709E-01 @(P 1.109E-01 4.12E-02 G
                                                          Energy duplication
                           77.11 0.000E+00 } P 6.444E-01 0.00E+00 G
                          241.92 3.345E-01  (  3.932E-01 1.22E-01 G

BI-212       2.9812E-01
                          727.17 2.981E-01  (P 1.599E-01 6.24E-02 G K
                         1620.56-1.998E-03 % P 1.111E+00 3.00E-01 G
                          785.42 7.787E-01 %   1.179E+00 3.69E-01 G

BI-214       2.5686E-01
                          609.32 2.569E-01  (P 5.567E-02 2.62E-02 G K
                         1764.51 3.690E-01 + P 1.186E-01 6.39E-02 G
                         1120.28 3.587E-01 + P 2.405E-01 9.83E-02 G

RA-224       7.0080E-01
                          241.00 7.008E-01  (  7.801E-01 2.42E-01 G

RA-226       6.7548E-01
                          185.99 6.755E-01  (P 8.258E-01 2.53E-01 G

AC-228       3.9913E-01
                          911.07 3.884E-01 @(P 9.964E-02 4.88E-02 G K
                          968.90 6.740E-01 + P 1.957E-01 9.92E-02 G
                          338.40 4.249E-01  (P 1.817E-01 7.00E-02 G

TH-227      -6.2026E-02
                          236.00-6.203E-02 &(  2.941E-01 8.80E-02 G K
                          256.25 6.443E-02 & P 3.314E-01 9.84E-02 G

PA-234      -2.0373E-02
                           98.44-2.037E-02 %(P 1.613E-01 4.80E-02 G K
                          946.00 3.117E-02 % P 1.293E-01 3.76E-02 G
                          131.28 2.636E-02 & P 1.593E-01 4.76E-02 G
                           94.67-7.985E-02 % P 2.853E-01 8.56E-02 G
                          883.24 6.967E-03 %   2.231E-01 6.27E-02 G
                          926.70 9.052E-02 &   2.169E-01 6.51E-02 G
```

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 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26 5.190E-02 % P 2.078E-01 6.06E-02 G

TH-234       6.1067E-01
                           63.29 6.107E-01 &(P 4.914E+00 1.46E+00 G K
                           92.80 8.317E-01 % P 1.577E+00 4.76E-01 G
                           92.38 1.022E+00 % P 1.858E+00 5.61E-01 G

AM-241      -4.9626E-03
                           59.54-4.963E-03 &(P 7.000E-01 2.06E-01 G
   ( - This peak used in the nuclide activity average.

   * - Peak is too wide, but only one peak in library.
   ! - Peak is part of a multiplet and this area went
       negative during deconvolution.
   ? - Peak is too narrow.
   @ - Peak is too wide at FW25M, but ok at FWHM.
   % - Peak fails sensitivity test.
   $ - Peak identified, but first peak of this nuclide
       failed one or more qualification tests.
   + - Peak activity higher than counting uncertainty range.
   - - Peak activity lower than counting uncertainty range.
   = - Peak outside analysis energy range.
   & - Calculated peak centroid is not close enough to the
       library energy centroid for positive identification.
   P - Peakbackground subtraction
   } - Peak is too close to another for the activity
       to be found directly.

   Nuclide Codes:                      Peak Codes:
   T - Thermal Neutron Activation      G - Gamma Ray
   F - Fast Neutron Activation         X - X-Ray
   I - Fission Product                 P - Positron Decay
   N - Naturally Occurring Isotope     S - Single-Escape
   P - Photon Reaction                 D - Double-Escape
   C - Charged Particle Reaction       K - Key Line
   M - No MDA Calculation              A - Not in Average
   R - Coincidence Corrected           C - Coincidence Peak
   H - Halflife limit exceeded

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
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***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	1.6245E-01	1.6662E-01	1.9681E-01	1.9705E-01	2.028E-01
K-40		9.3129E+00	9.3129E+00	9.8961E-01	1.1277E+00	
MN-54	#A	-2.2446E-03	-2.2543E-03	2.9779E-02	2.9779E-02	2.740E-02
CO-57	#B	-1.4502E-04	-1.4575E-04	2.9631E-02	2.9631E-02	3.846E-02
CO-60	#B	-3.1180E-04	-3.1202E-04	3.1580E-02	3.1580E-02	3.128E-02

Sr-85	#A	-6.0375E-03	-6.1648E-03	2.7376E-02	2.7378E-02	3.027E-02
Kr-85	#A	-1.3949E+02	-1.3949E+02	6.1898E+02	6.1903E+02	6.989E+02
Y-88	#B	1.2727E-03	1.2889E-03	1.7179E-02	1.7179E-02	2.185E-02
NB-94	#B	0.0000E+00	0.0000E+00	2.7848E-02	2.7848E-02	3.269E-02
Ag-108M	#B	-2.4415E-03	-2.4416E-03	1.7319E-02	1.7320E-02	2.052E-02
CD-109	#A	-1.2884E-02	-1.2923E-02	1.3373E+00	1.3373E+00	1.497E+00
SN-113	#B	2.7822E-03	2.8151E-03	2.9116E-02	2.9117E-02	3.304E-02
SB-125	#F	7.1824E-02	7.1920E-02	4.8823E-02	4.9001E-02	6.155E-02
I-131	#B	-1.4517E-03	-1.7178E-03	4.6366E-02	4.6366E-02	2.838E-02
CS-134	#B	-3.5797E-03	-3.5861E-03	2.1220E-02	2.1221E-02	2.439E-02
CS-137	#A	1.1983E-03	1.1985E-03	2.7795E-02	2.7795E-02	3.252E-02
CE-139	#A	7.5590E-03	7.6338E-03	2.9630E-02	2.9634E-02	3.269E-02
EU-152	#B	-9.4231E-04	-9.4259E-04	1.8608E-01	1.8608E-01	1.097E-01
EU-154	#B	-1.0946E-02	-1.0951E-02	7.4120E-02	7.4123E-02	8.277E-02
EU-155	#B	7.0822E-02	7.0875E-02	1.5063E-01	1.5068E-01	1.658E-01
HG-203	#B	1.2797E-02	1.3174E-02	2.4691E-02	2.4703E-02	2.635E-02
TL-208		1.2377E-01	1.2377E-01	4.5507E-02	4.6071E-02	
PB-212		4.2397E-01	4.2397E-01	9.0846E-02	9.4121E-02	
PB-214		2.9037E-01	2.9037E-01	8.2815E-02	8.4513E-02	
BI-212	#	2.9812E-01	2.9812E-01	1.8731E-01	1.8811E-01	
BI-214		2.5686E-01	2.5686E-01	7.8470E-02	7.9875E-02	
RA-224	#A	7.0080E-01	7.0080E-01	7.2513E-01	7.2627E-01	7.801E-01
RA-226	#A	6.7547E-01	6.7548E-01	7.5971E-01	7.6072E-01	8.258E-01
AC-228		3.9913E-01	3.9913E-01	1.2393E-01	1.2608E-01	
TH-227	#B	-6.2026E-02	-6.2026E-02	2.6409E-01	2.6412E-01	2.941E-01
PA-234	#B	-2.0373E-02	-2.0373E-02	1.6617E-01	1.6617E-01	1.613E-01
TH-234	#B	6.1067E-01	6.1067E-01	4.3767E+00	4.3768E+00	4.914E+00
AM-241	#A	-4.9626E-03	-4.9626E-03	1.2281E+00	1.2281E+00	7.000E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (86.9 to 2000.7 keV) 1.1105068E+01 pCi/gm
Total Decayed Activity (86.9 to 2000.7 keV) 1.1105068E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
DAT

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 103F_27JUL2006_1201.An1

Sample description
FSS-OOL-05-06-016-F

Spectrum Filename: C:\GammaVision\Spectra\103F_27JUL2006_1201.An1

Acquisition information
Start time: 27-Jul-2006 12:01:20
Live time: 2000
Real time: 2002
Dead time: 0.09 %
Detector ID: 4

Detector system
Det 103 - DSPE-471

Calibration
Filename: D3_1LSa.Clb
Detector_103 1.0 Liter Sand Geometry

Energy Calibration
Created: 08-Aug-2005 11:09:41
Zero offset: 0.409 keV
Gain: 0.500 keV/channel
Quadratic: 1.092E-08 keV/channel^2

Efficiency Calibration
Created: 08-Aug-2005 11:11:25
Type: Polynomial
Uncertainty: 0.993 %
Coefficients: -0.264059 -5.138468 0.638383
-0.089199 0.005011 -0.000129

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.41keV)
Stop channel: 4000 (2000.67keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 1.6990E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.6990E+03) =
5.8858E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	24-Jul-2006 22:05:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	103_150K_05AUG05.Pbc 08-Aug-2005 12:54:15
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 17 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.1962

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
74.84	102.	23.50	0.99	9.052E-03	74.81	9.600	9.347E-01	PB212
77.14	118.	17.20	0.99	1.011E-02	77.11	17.500	6.124E-01	PB212
186.52	100.	31.24	1.32	2.565E-02	185.99	3.280	PBC<MDA	RA226
238.84	832.	4.21	1.09	2.319E-02	238.63	43.100	6.526E-01	PB212
241.89	105.	22.40	1.10	2.302E-02	241.00	3.900	9.312E-01	RA224
					241.92	7.470	4.872E-01	PB214
295.29	226.	11.30	0.93	2.024E-02	295.22	19.200	4.545E-01	PB214
300.18	56.	31.84	1.02	2.001E-02				
338.45	176.	17.51	1.04	1.830E-02	338.40	12.010	6.329E-01	AC228
351.85	377.	7.37	1.19	1.776E-02	351.99	37.100	4.485E-01	PB214
462.90	60.	28.14	1.28	1.426E-02				
462.90	60.	28.14	1.28	1.426E-02	463.51	10.000	3.262E-01	SB125
510.90	144.	14.65	1.13	1.317E-02	510.72	22.500	3.135E-01	TL208
583.19	303.	8.41	1.32	1.184E-02	583.14	86.000	2.330E-01	TL208
609.22	278.	8.42	1.51	1.144E-02	609.32	46.090	4.096E-01	BI214
727.17	77.	24.62	1.29	9.965E-03	727.17	11.800	5.155E-01	BI212
769.12	74.	25.26	0.66	9.545E-03				
794.42	52.	35.19	1.00	9.313E-03				
911.42	185.	9.67	1.27	8.399E-03	911.07	29.000	5.943E-01	AC228
968.39	171.	12.57	1.70	8.029E-03	968.90	17.460	9.681E-01	AC228
1120.27	77.	20.58	1.14	7.212E-03	1120.28	15.040	5.530E-01	BI214
1460.89	1201.	2.96	1.89	5.932E-03	1460.75	10.700	1.481E+01	K40
1764.62	41.	16.48	1.27	5.142E-03	1764.51	15.920	3.938E-01	BI214

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

Peak Centroid	Background	Net Area	Intensity	Uncert	FWHM	Suspected

Channel	Energy	Counts	Counts	Cts/Sec	3 Sigma %	keV	Nuclide	
599.51	300.18	131.	56.	0.028	95.53	1.020	PB-212	s

Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM	Suspected	
1537.30	769.12	78.	74.	0.037	75.79	0.663	BI-214	sM
1587.90	794.42	83.	52.	0.026	84.27	1.001	AC-228	s

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.
M - Peak is close to a library peak.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-212	148.79	74.81	256.	102.	0.051	70.51	0.993D
PB-212	153.39	77.11	284.	118.	0.059	51.59	0.995A
RA-226	371.76	186.30	525.	96.	0.048	92.61	1.500s
PB-212	476.87	238.86	502.	787.	0.393	16.91	0.957
RA-224	483.09	241.97	512.	93.	0.047	107.68	1.500
PB-214	482.91	241.88	238.	60.	0.030	109.73	0.621s
PB-214	589.74	295.29	182.	222.	0.111	33.89	0.926
AC-228	676.04	338.45	259.	175.	0.087	52.54	1.043
PB-214	702.84	351.85	158.	371.	0.186	22.11	1.187s
SB-125	925.03	462.96	92.	55.	0.028	81.78	1.500
TL-208	1020.91	510.90	137.	117.	0.058	43.94	1.127s
TL-208	1165.48	583.19	116.	298.	0.149	25.22	1.319s
BI-214	1217.54	609.22	96.	272.	0.136	25.26	1.511
BI-212	1453.42	727.17	91.	76.	0.038	73.86	1.286s
AC-228	1821.87	911.42	52.	182.	0.091	29.01	1.268
AC-228	1935.79	968.39	78.	171.	0.085	37.71	1.700s
BI-214	2239.52	1120.27	59.	75.	0.038	61.74	1.136s
K-40	2920.65	1460.89	37.	1182.	0.591	8.89	1.888
BI-214	3528.00	1764.62	6.	41.	0.020	49.45	1.272s

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

Nuclide Name	Nuclide Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	Peak MDA Value pCi/gm	COMMENTS
BE-7		-1.6713E-02					
			477.56	-1.671E-02	%(	2.492E-01	7.16E-02 G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
K-40	1.4813E+01						
		1460.75	1.481E+01	(P	3.888E-01	4.46E-01	G
MN-54	6.3038E-04						
		834.81	6.304E-04	&(P	3.862E-02	1.10E-02	G
CO-57	-1.0407E-03						
		122.07	-1.041E-03	%(P	4.522E-02	1.34E-02	G K
		136.43	-7.232E-02	%	3.380E-01	1.01E-01	G
CO-60	-1.7102E-03						
		1332.51	-1.710E-03	&(P	3.275E-02	8.55E-03	G K
		1173.23	6.528E-03	% P	5.147E-02	1.48E-02	G K
Sr-85	-1.4958E-02						
		514.00	-1.496E-02	%(	4.432E-02	1.33E-02	G
Kr-85	-3.3594E+02						
		513.99	-3.359E+02	%(	9.954E+02	2.99E+02	G
Y-88	-1.1804E-04						
		1836.01	-1.180E-04	%(P	2.266E-02	5.51E-03	G K
		898.02	1.751E-02	& P	4.001E-02	1.20E-02	G
NB-94	-3.2090E-04						
		871.10	-3.209E-04	&(	3.317E-02	9.33E-03	G K
		702.50	-4.218E-03	%	3.268E-02	9.45E-03	G K
Ag-108M	-1.1280E-02						
		722.95	-1.128E-02	&(	4.329E-02	1.28E-02	G K
		614.37	-4.456E-03	% P	3.435E-02	9.95E-03	G
		433.93	9.265E-03	&	3.202E-02	9.52E-03	G
CD-109	1.0736E+00						
		88.04	1.074E+00	%(	1.784E+00	5.44E-01	G
SN-113	-6.8185E-03						
		391.71	-6.818E-03	%(	4.958E-02	1.46E-02	G K
		255.04	1.313E-01	&	1.534E+00	4.54E-01	G
SB-125	6.4764E-02						
		427.95	-1.795E-02	%(P	9.566E-02	2.81E-02	G K
		600.77	1.464E-02	& P	1.636E-01	4.72E-02	G
		636.15	-6.200E-02	% P	3.182E-01	9.31E-02	G
		463.51	3.096E-01	(P	2.653E-01	8.63E-02	G
		176.29	-1.313E-01	%	5.590E-01	1.68E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
I-131	-1.2436E-02						
		364.48	-1.244E-02	%(P	4.277E-02	1.27E-02	G K
		636.97	-1.271E-01	%	6.196E-01	1.82E-01	G
		284.29	-1.582E-01	% P	6.838E-01	2.04E-01	G
CS-134	-2.2666E-03						
		604.66	-2.267E-03	%(	7.622E-02	2.26E-02	G K
		795.76	-8.753E-05	% P	3.682E-02	1.03E-02	G
		569.29	4.705E-02	% P	1.715E-01	5.03E-02	G
		801.84	-2.919E-03	& P	4.192E-01	1.18E-01	G
CS-137	1.1933E-02						
		661.62	1.193E-02	%(P	3.668E-02	1.09E-02	G
CE-139	1.1283E-02						
		165.85	1.128E-02	%(	4.544E-02	1.36E-02	G
EU-152	3.9855E-02						
		121.78	3.986E-02	&(P	1.237E-01	3.72E-02	G K
		344.30	-1.109E-02	& P	1.083E-01	3.18E-02	G
		1408.08	-2.763E-04	%	1.125E-01	2.91E-02	G
		964.00	8.045E-03	% P	3.794E-01	1.10E-01	G
		1112.07	8.152E-02	%	2.814E-01	8.28E-02	G
		778.90	2.314E-02	%	2.331E-01	6.65E-02	G
EU-154	-8.3362E-03						
		123.10	-8.336E-03	%(	1.101E-01	3.28E-02	G K
		1274.80	3.637E-02	&	1.299E-01	3.83E-02	G
		723.30	-1.328E-02	&	1.986E-01	5.74E-02	G
		1004.80	-2.853E-02	%	2.073E-01	5.96E-02	G
EU-155	1.3271E-01						
		86.45	1.327E-01	%(	2.249E-01	6.85E-02	G K
		105.31	4.642E-02	%	2.112E-01	6.33E-02	G
HG-203	-3.6289E-03						
		279.17	-3.629E-03	&(P	4.132E-02	1.22E-02	G K
		72.87	-1.146E+00	% P	2.287E+00	6.94E-01	G
		70.83	-1.145E+00	&	4.274E+00	1.28E+00	G
		82.50	-6.965E-01	%	3.780E+00	1.13E+00	G
TL-208	2.3299E-01						
		583.14	2.330E-01	*(P	4.124E-02	1.99E-02	G
		510.72	3.135E-01	+ P	1.537E-01	5.64E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
PB-212	6.2184E-01						
		238.63	6.257E-01	(P	8.525E-02	3.58E-02	G K
							Energy duplication
		77.11	5.315E-01	} P	3.649E-01	9.14E-02	G
		74.81	9.347E-01	+ P	7.077E-01	2.26E-01	G
PB-214	4.5052E-01						
		351.99	4.485E-01	@(P	7.393E-02	3.35E-02	G K
		295.22	4.545E-01	(P	1.341E-01	5.23E-02	G
							Energy duplication
		77.11	0.000E+00	} P	8.714E-01	0.00E+00	G
		241.92	2.794E-01	-	3.448E-01	1.02E-01	G
BI-212	5.1548E-01						
		727.17	5.155E-01	*(P	3.187E-01	1.28E-01	G K
		1620.56	3.182E-01	% P	9.449E-01	2.76E-01	G
		785.42	7.464E-01	%	1.541E+00	4.68E-01	G
BI-214	4.0556E-01						
		609.32	4.096E-01	(P	7.314E-02	3.53E-02	G K
		1764.51	3.938E-01	(P	1.415E-01	7.02E-02	G
		1120.28	5.530E-01	+ P	2.814E-01	1.17E-01	G
RA-224	8.2311E-01						
		241.00	8.231E-01	(	9.561E-01	2.95E-01	G
RA-226	9.0797E-01						
		185.99	9.080E-01	(P	1.035E+00	3.18E-01	G
AC-228	6.0559E-01						
		911.07	5.943E-01	(P	1.185E-01	5.86E-02	G K
		968.90	9.681E-01	+ P	2.497E-01	1.22E-01	G
		338.40	6.329E-01	(P	2.812E-01	1.12E-01	G
TH-227	-2.1316E-01						
		236.00	-2.132E-01	%(	4.036E-01	1.23E-01	G K
		256.25	5.748E-02	% P	4.007E-01	1.19E-01	G
PA-234	5.4470E-02						
		98.44	5.447E-02	&(P	1.971E-01	5.92E-02	G K
		946.00	5.170E-03	& P	2.322E-01	6.66E-02	G
		131.28	-3.274E-03	& P	2.047E-01	6.08E-02	G
		94.67	-8.747E-02	& P	3.845E-01	1.15E-01	G
		883.24	3.838E-02	%	2.407E-01	6.89E-02	G
		926.70	4.034E-02	&	2.994E-01	8.58E-02	G
		569.26	6.959E-02	% P	2.538E-01	7.44E-02	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments

TH-234       5.0264E-01
                           63.29 5.026E-01 &(P 6.098E+00 1.81E+00 G K
                                                          Energy duplication
                           92.80 8.000E-01 % P 2.015E+00 6.05E-01 G
                           92.38 9.364E-01 % P 2.448E+00 7.35E-01 G

AM-241      -4.4000E-01
                           59.54-4.400E-01 %(P 1.123E+00 3.39E-01 G
   ( - This peak used in the nuclide activity average.

   * - Peak is too wide, but only one peak in library.
   ! - Peak is part of a multiplet and this area went
       negative during deconvolution.
   ? - Peak is too narrow.
   @ - Peak is too wide at FW25M, but ok at FWHM.
   % - Peak fails sensitivity test.
   $ - Peak identified, but first peak of this nuclide
       failed one or more qualification tests.
   + - Peak activity higher than counting uncertainty range.
   - - Peak activity lower than counting uncertainty range.
   = - Peak outside analysis energy range.
   & - Calculated peak centroid is not close enough to the
       library energy centroid for positive identification.
   P - Peakbackground subtraction
   } - Peak is too close to another for the activity
       to be found directly.

   Nuclide Codes:                      Peak Codes:
   T - Thermal Neutron Activation      G - Gamma Ray
   F - Fast Neutron Activation         X - X-Ray
   I - Fission Product                 P - Positron Decay
   N - Naturally Occurring Isotope     S - Single-Escape
   P - Photon Reaction                 D - Double-Escape
   C - Charged Particle Reaction       K - Key Line
   M - No MDA Calculation              A - Not in Average
   R - Coincidence Corrected           C - Coincidence Peak
   H - Halflife limit exceeded

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
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***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	-1.6162E-02	-1.6713E-02	2.1476E-01	2.1476E-01	2.410E-01
K-40		1.4813E+01	1.4813E+01	1.3378E+00	1.5904E+00	
MN-54	#A	6.2678E-04	6.3038E-04	3.3001E-02	3.3001E-02	3.840E-02
CO-57	#B	-1.0338E-03	-1.0407E-03	5.6120E-02	5.6120E-02	4.492E-02
CO-60	#B	-1.7086E-03	-1.7102E-03	8.0154E-02	8.0154E-02	3.272E-02

Sr-85	#A	-1.4551E-02	-1.4958E-02	3.9878E-02	3.9888E-02	4.312E-02

Kr-85	#A	-3.3594E+02	-3.3594E+02	8.9557E+02	8.9578E+02	9.954E+02
Y-88	#B	-1.1607E-04	-1.1804E-04	2.3980E-01	2.3980E-01	2.228E-02
NB-94	#B	-3.2090E-04	-3.2090E-04	2.7985E-02	2.7985E-02	3.317E-02
Ag-108M	#B	-1.1279E-02	-1.1280E-02	3.8424E-02	3.8430E-02	4.329E-02
CD-109	#A	1.0694E+00	1.0736E+00	1.6321E+00	1.6332E+00	1.777E+00
SN-113	#B	-6.7133E-03	-6.8185E-03	4.3777E-02	4.3779E-02	4.881E-02
SB-125	#B	6.4649E-02	6.4764E-02	5.4185E-02	5.4316E-02	9.550E-02
I-131	#B	-9.9552E-03	-1.2436E-02	4.1217E-02	4.1223E-02	3.424E-02
CS-134	#B	-2.2612E-03	-2.2666E-03	6.7752E-02	6.7752E-02	7.604E-02
CS-137	#A	1.1931E-02	1.1933E-02	3.2560E-02	3.2567E-02	3.668E-02
CE-139	#A	1.1137E-02	1.1283E-02	4.0897E-02	4.0903E-02	4.485E-02
EU-152	#B	3.9840E-02	3.9855E-02	1.1156E-01	1.1158E-01	1.236E-01
EU-154	#B	-8.3314E-03	-8.3362E-03	9.8477E-02	9.8478E-02	1.100E-01
EU-155	#B	1.3257E-01	1.3271E-01	2.0556E-01	2.0570E-01	2.247E-01
HG-203	#B	-3.4922E-03	-3.6289E-03	3.7019E-02	3.7019E-02	3.976E-02
TL-208	#	2.3299E-01	2.3299E-01	5.9617E-02	6.1132E-02	
PB-212		6.2184E-01	6.2184E-01	1.0673E-01	1.1267E-01	
PB-214		4.5052E-01	4.5052E-01	9.2732E-02	9.6350E-02	
BI-212	#	5.1548E-01	5.1548E-01	3.8323E-01	3.8439E-01	
BI-214		4.0556E-01	4.0556E-01	1.0489E-01	1.0750E-01	
RA-224	A	8.2311E-01	8.2311E-01	8.8636E-01	8.8765E-01	9.561E-01
RA-226	#A	9.0797E-01	9.0797E-01	9.5423E-01	9.5568E-01	1.035E+00
AC-228		6.0559E-01	6.0559E-01	1.7895E-01	1.8237E-01	
TH-227	#B	-2.1316E-01	-2.1316E-01	3.6799E-01	3.6820E-01	4.036E-01
PA-234	#B	5.4470E-02	5.4470E-02	1.7753E-01	1.7756E-01	1.971E-01
TH-234	#B	5.0264E-01	5.0264E-01	5.4273E+00	5.4273E+00	6.098E+00
AM-241	#A	-4.3999E-01	-4.4000E-01	1.0264E+00	1.0267E+00	1.123E+00

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (86.9 to 2000.7 keV) 1.8467859E+01 pCi/gm
Total Decayed Activity (86.9 to 2000.7 keV) 1.8467859E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
DAT

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 103F_27JUL2006_1257.An1

Sample description
FSS-OOL-05-06-006-F

Spectrum Filename: C:\GammaVision\Spectra\103F_27JUL2006_1257.An1

Acquisition information
Start time: 27-Jul-2006 12:57:41
Live time: 2000
Real time: 2001
Dead time: 0.07 %
Detector ID: 4

Detector system
Det 103 - DSPE-471

Calibration
Filename: D3_1LSa.Clb
Detector_103 1.0 Liter Sand Geometry

Energy Calibration
Created: 08-Aug-2005 11:09:41
Zero offset: 0.409 keV
Gain: 0.500 keV/channel
Quadratic: 1.092E-08 keV/channel^2

Efficiency Calibration
Created: 08-Aug-2005 11:11:25
Type: Polynomial
Uncertainty: 0.993 %
Coefficients: -0.264059 -5.138468 0.638383
-0.089199 0.005011 -0.000129

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.41keV)
Stop channel: 4000 (2000.67keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 1.2910E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.2910E+03) =
7.7459E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	24-Jul-2006 21:23:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	103_150K_05AUG05.Pbc 08-Aug-2005 12:54:15
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 16 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.1900

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
74.98	87.	23.98	0.99	9.052E-03	74.81	9.600	1.051E+00	PB212
77.28	122.	18.39	0.99	1.011E-02	77.11	17.500	9.324E-01	PB212
					77.11	10.700	1.525E+00	PB214
87.09	96.	22.98	1.00	1.431E-02	86.45	32.740	2.185E-01	EU155
					88.04	3.790	1.814E+00	CD109
93.77	62.	34.45	1.00	1.674E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
186.02	153.	19.88	1.26	2.567E-02	185.99	3.280	1.741E+00	RA226
209.41	63.	40.59	1.12	2.471E-02				
238.91	707.	4.37	1.09	2.319E-02	238.63	43.100	7.273E-01	PB212
241.85	113.	17.76	1.10	2.303E-02	241.00	3.900	1.315E+00	RA224
					241.92	7.470	6.881E-01	PB214
270.31	72.	25.72	1.54	2.151E-02				
295.09	171.	12.62	1.12	2.025E-02	295.22	19.200	4.503E-01	PB214
300.54	75.	28.90	1.29	1.999E-02				
328.18	67.	25.30	1.23	1.873E-02				
338.27	162.	14.90	0.81	1.831E-02	338.40	12.010	7.644E-01	AC228
352.08	270.	8.12	0.95	1.775E-02	351.99	37.100	4.201E-01	PB214
463.31	36.	29.86	0.96	1.425E-02				
463.31	36.	29.86	0.96	1.425E-02	463.51	10.000	PBC<MDA	SB125
476.83	49.	28.49	1.39	1.392E-02				
476.83	49.	28.49	1.39	1.392E-02	477.56	10.300	3.691E-01	BE7
511.05	114.	19.24	1.57	1.317E-02	510.72	22.500	3.070E-01	TL208
583.37	237.	8.57	1.36	1.184E-02	583.14	86.000	2.389E-01	TL208
609.40	232.	10.61	1.13	1.144E-02	609.32	46.090	4.478E-01	BI214
661.73	75.	27.43	1.07	1.072E-02	661.62	84.620	8.471E-02	CS137
727.20	52.	31.56	0.75	9.964E-03	727.17	11.800	4.612E-01	BI212

795.28	27.	40.25	1.50	9.301E-03	795.76	85.400	PBC<MDA	CS134
860.98	49.	35.24	0.94	8.764E-03				
911.51	151.	10.26	1.19	8.398E-03	911.07	29.000	6.326E-01	AC228
968.60	128.	14.33	1.69	8.028E-03	968.90	17.460	9.573E-01	AC228
1121.05	70.	19.78	1.20	7.208E-03	1120.28	15.040	6.534E-01	BI214
1461.04	833.	3.51	1.84	5.931E-03	1460.75	10.700	1.343E+01	K40

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
1764.70	29.	19.10	1.49	5.142E-03	1764.51	15.920	3.686E-01	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
417.97	209.41	256.	63.	0.031	121.78	1.119	AC-228	
539.77	270.31	130.	72.	0.036	77.15	1.540	AC-228	s
600.23	300.54	154.	75.	0.038	86.69	1.292	PB-212	s
655.51	328.18	101.	67.	0.034	75.89	1.228	AC-228	s
952.79	476.83	60.	49.	0.024	85.47	1.388	BE-7	l
1721.00	860.98	64.	49.	0.024	105.72	0.939	TL-208	s

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-212	148.79	74.81	193.	87.	0.044	71.93	0.993D
PB-212	153.39	77.11	203.	122.	0.061	55.17	0.995A
EU-155	173.48	87.15	516.	104.	0.052	96.82	1.500
CD-109	173.59	87.21	442.	98.	0.049	95.81	1.500s
TH-234	185.66	93.25	454.	84.	0.042	92.26	1.500
TH-234	185.72	93.28	447.	81.	0.040	94.10	1.500
RA-226	371.54	186.19	369.	119.	0.060	66.05	1.500
PB-212	476.89	238.87	422.	688.	0.344	18.21	0.906
RA-224	482.70	241.77	386.	100.	0.050	88.25	1.500
PB-214	482.69	241.77	193.	49.	0.025	121.38	1.527s
PB-214	589.33	295.09	133.	167.	0.084	37.86	1.120
AC-228	675.67	338.27	150.	161.	0.080	44.71	0.811
PB-214	703.35	352.10	111.	270.	0.135	25.22	0.961
SB-125	925.19	463.04	69.	34.	0.017	111.05	1.500
TL-208	1021.20	511.05	137.	87.	0.043	57.73	1.570s
TL-208	1165.85	583.37	72.	232.	0.116	25.70	1.356s
BI-214	1217.89	609.40	110.	226.	0.113	31.84	1.130s
CS-137	1322.54	661.73	96.	71.	0.035	83.80	1.069
BI-212	1453.47	727.20	67.	52.	0.026	94.67	0.751s
CS-134	1589.63	795.28	44.	27.	0.013	120.74	1.500s
AC-228	1822.06	911.51	34.	147.	0.074	30.78	1.192
AC-228	1936.21	968.60	57.	128.	0.064	42.99	1.691

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
BI-214	2241.08	1121.05	34.	68.	0.034	59.33	1.200s
K-40	2920.94	1461.04	25.	814.	0.407	10.54	1.838
BI-214	3528.15	1764.70	5.	29.	0.014	57.31	1.485

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Code	MDA Value pCi/gm	COMMENTS
BE-7		2.3913E-01					
			477.56	2.391E-01	%(	3.423E-01 1.07E-01 G	
K-40		1.3429E+01					
			1460.75	1.343E+01	(P	4.268E-01 4.83E-01 G	
MN-54		1.8626E-02					
			834.81	1.863E-02	%(P	3.490E-02 1.07E-02 G	
CO-57		6.6540E-03					
			122.07	6.654E-03	%(P	5.611E-02 1.67E-02 G K	
			136.43	7.544E-02	%	4.248E-01 1.27E-01 G	
CO-60		-6.1862E-03					
			1332.51	-6.186E-03	%(P	3.796E-02 9.58E-03 G K	
			1173.23	-1.914E-03	% P	5.478E-02 1.51E-02 G K	
Sr-85		-1.1977E-02					
			514.00	-1.198E-02	%(	5.050E-02 1.50E-02 G	
Kr-85		-2.6877E+02					
			513.99	-2.688E+02	%(	1.133E+03 3.36E+02 G	
Y-88		-4.5554E-03					
			1836.01	-4.555E-03	%(P	3.503E-02 9.35E-03 G K	
			898.02	-2.827E-03	% P	4.473E-02 1.25E-02 G	
NB-94		1.2825E-03					
			871.10	1.283E-03	%(	4.388E-02 1.24E-02 G K	
			702.50	5.626E-03	%	3.671E-02 1.06E-02 G K	
Ag-108M		-8.6633E-03					
			722.95	-8.663E-03	%(	4.716E-02 1.37E-02 G K	
			614.37	-9.450E-03	% P	4.231E-02 1.24E-02 G	
			433.93	-1.256E-02	%	4.150E-02 1.24E-02 G	

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CD-109	1.8480E+00						
		88.04	1.848E+00	*(	1.896E+00	5.90E-01	G
SN-113	9.6459E-03						
		391.71	9.646E-03	&(	5.580E-02	1.64E-02	G K
		255.04	-2.451E-02	%	1.948E+00	5.73E-01	G
SB-125	4.4059E-02						
		427.95	-2.541E-02	%(P	1.246E-01	3.67E-02	G K
		600.77	5.143E-03	& P	1.813E-01	5.12E-02	G
		636.15	1.100E-01	% P	2.635E-01	7.89E-02	G
		463.51	2.497E-01	?(P	3.039E-01	9.59E-02	G
		176.29	9.135E-02	%	4.725E-01	1.40E-01	G
I-131	-2.6902E-03						
		364.48	-2.690E-03	&(P	4.434E-02	1.27E-02	G K
		636.97	2.190E-01	%	4.968E-01	1.50E-01	G
		284.29	7.381E-02	& P	7.178E-01	2.11E-01	G
CS-134	1.7463E-02						
		604.66	1.989E-03	%(	8.646E-02	2.55E-02	G K
		795.76	3.515E-02	@(P	4.462E-02	1.42E-02	G
		569.29	7.480E-02	& P	2.123E-01	6.28E-02	G
		801.84	-1.326E-01	% P	5.196E-01	1.50E-01	G
CS-137	8.1477E-02						
		661.62	8.148E-02	(P	5.592E-02	2.32E-02	G
CE-139	-5.4184E-04						
		165.85	-5.418E-04	%(	5.281E-02	1.56E-02	G
EU-152	1.8637E-02						
		121.78	1.864E-02	%(P	1.636E-01	4.87E-02	G K
		344.30	1.363E-02	& P	1.214E-01	3.55E-02	G
		1408.08	3.072E-02	&	1.520E-01	4.25E-02	G
		964.00	1.428E-01	& P	3.000E-01	9.08E-02	G
		1112.07	1.143E-01	%	3.284E-01	9.74E-02	G
		778.90	-7.510E-02	%	3.405E-01	9.96E-02	G
EU-154	7.5593E-03						
		123.10	7.559E-03	%(	1.074E-01	3.18E-02	G K
		1274.80	-1.369E-02	%	1.459E-01	4.13E-02	G
		723.30	-5.920E-02	%	2.395E-01	7.06E-02	G
		1004.80	-3.911E-02	%	2.632E-01	7.56E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
EU-155	2.3692E-01						
		86.45	2.369E-01	(	2.462E-01	7.65E-02	G K
		105.31	6.930E-02	%	2.368E-01	7.11E-02	G
HG-203	8.3798E-04						
		279.17	8.380E-04	&(P	4.124E-02	1.20E-02	G K
		72.87	-1.989E-01	% P	1.947E+00	5.76E-01	G
		70.83	-1.304E+00	%	4.705E+00	1.41E+00	G
		82.50	-1.342E+00	&	3.967E+00	1.19E+00	G
TL-208	2.3891E-01						
		583.14	2.389E-01	@(P	4.328E-02	2.09E-02	G
		510.72	3.070E-01	+ P	2.023E-01	7.72E-02	G
PB-212	7.2061E-01						
		238.63	7.206E-01	(P	1.030E-01	4.45E-02	G K
							Energy duplication
		77.11	7.206E-01	} P	4.090E-01	1.33E-01	G
		74.81	1.051E+00	+ P	8.119E-01	2.61E-01	G
PB-214	4.3671E-01						
		351.99	4.297E-01	(P	8.221E-02	3.69E-02	G K
		295.22	4.503E-01	(P	1.519E-01	5.82E-02	G
							Energy duplication
		77.11	2.125E-01	} P	9.820E-01	2.49E-01	G
		241.92	2.995E-01	-	4.103E-01	1.21E-01	G
BI-212	4.6118E-01						
		727.17	4.612E-01	(P	3.642E-01	1.47E-01	G K
		1620.56	4.085E-01	% P	1.073E+00	3.17E-01	G
		785.42	7.054E-01	%	2.004E+00	5.96E-01	G
BI-214	4.2744E-01						
		609.32	4.478E-01	@(P	1.026E-01	4.89E-02	G K
		1764.51	3.686E-01	(P	1.702E-01	7.84E-02	G
		1120.28	6.534E-01	+ P	2.895E-01	1.33E-01	G
RA-224	1.1680E+00						
		241.00	1.168E+00	(	1.096E+00	3.44E-01	G
RA-226	1.4799E+00						
		185.99	1.480E+00	(P	1.147E+00	3.61E-01	G
AC-228	6.7117E-01						
		911.07	6.326E-01	(P	1.280E-01	6.64E-02	G K
		968.90	9.573E-01	+ P	2.827E-01	1.37E-01	G
		338.40	7.644E-01	(P	2.852E-01	1.15E-01	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments

TH-227      -1.1665E-01
                          236.00-1.167E-01 %(  4.469E-01 1.34E-01 G K
                          256.25-8.475E-02 % P 5.300E-01 1.57E-01 G

PA-234       9.8786E-02
                           98.44 9.879E-02 %(P 2.267E-01 6.86E-02 G K
                          946.00 3.202E-02 & P 1.852E-01 5.29E-02 G
                          131.28 3.439E-02 & P 2.233E-01 6.65E-02 G
                           94.67-2.331E-01 % P 4.525E-01 1.37E-01 G
                          883.24-4.973E-02 %   3.030E-01 8.66E-02 G
                          926.70-8.692E-02 &   4.035E-01 1.17E-01 G
                          569.26 1.107E-01 & P 3.142E-01 9.29E-02 G

TH-234       3.1528E-01
                           63.29-1.937E+00 %(P 6.898E+00 2.05E+00 G K
                           92.80 1.718E+00  (P 2.147E+00 6.56E-01 G
                           92.38 2.095E+00 &(P 2.549E+00 7.80E-01 G

AM-241      -1.6238E-01
                           59.54-1.624E-01 %(P 1.291E+00 3.84E-01 G
   ( - This peak used in the nuclide activity average.

   * - Peak is too wide, but only one peak in library.
   ! - Peak is part of a multiplet and this area went
       negative during deconvolution.
   ? - Peak is too narrow.
   @ - Peak is too wide at FW25M, but ok at FWHM.
   % - Peak fails sensitivity test.
   $ - Peak identified, but first peak of this nuclide
       failed one or more qualification tests.
   + - Peak activity higher than counting uncertainty range.
   - - Peak activity lower than counting uncertainty range.
   = - Peak outside analysis energy range.
   & - Calculated peak centroid is not close enough to the
       library energy centroid for positive identification.
   P - Peakbackground subtraction
   } - Peak is too close to another for the activity
       to be found directly.

   Nuclide Codes:                      Peak Codes:
   T - Thermal Neutron Activation      G - Gamma Ray
   F - Fast Neutron Activation         X - X-Ray
   I - Fission Product                 P - Positron Decay
   N - Naturally Occurring Isotope     S - Single-Escape
   P - Photon Reaction                 D - Double-Escape
   C - Charged Particle Reaction       K - Key Line
   M - No MDA Calculation              A - Not in Average
```

R - Coincidence Corrected C - Coincidence Peak
H - Halflife limit exceeded

- -

***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	2.3105E-01	2.3913E-01	3.1955E-01	3.1985E-01	3.307E-01
K-40		1.3429E+01	1.3429E+01	1.4483E+00	1.6448E+00	
MN-54	#A	1.8517E-02	1.8626E-02	3.2033E-02	3.2051E-02	3.469E-02
CO-57	#B	6.6089E-03	6.6540E-03	5.0098E-02	5.0099E-02	5.573E-02
CO-60	#B	-6.1803E-03	-6.1862E-03	1.6692E-01	1.6692E-01	3.792E-02
Sr-85	#A	-1.1642E-02	-1.1977E-02	4.4937E-02	4.4942E-02	4.909E-02
Kr-85	#A	-2.6876E+02	-2.6877E+02	1.0084E+03	1.0086E+03	1.133E+03
Y-88	#B	-4.4776E-03	-4.5554E-03	2.9780E-02	2.9781E-02	3.444E-02
NB-94	#B	1.2825E-03	1.2825E-03	3.7164E-02	3.7164E-02	4.388E-02
Ag-108M	#B	-8.6629E-03	-8.6633E-03	4.1193E-02	4.1196E-02	4.716E-02
CD-109	#A	1.8405E+00	1.8480E+00	1.7707E+00	1.7736E+00	1.888E+00
SN-113	#B	9.4933E-03	9.6459E-03	4.9198E-02	4.9202E-02	5.491E-02
SB-125	#B	4.3979E-02	4.4059E-02	5.0766E-02	5.0831E-02	1.244E-01
I-131	#B	-2.1409E-03	-2.6902E-03	6.2010E-02	6.2010E-02	3.528E-02
CS-134	#B	1.7421E-02	1.7463E-02	2.1154E-02	2.1179E-02	8.625E-02
CS-137		8.1464E-02	8.1477E-02	6.9621E-02	6.9781E-02	
CE-139	#A	-5.3465E-04	-5.4184E-04	4.6854E-02	4.6854E-02	5.211E-02
EU-152	#B	1.8630E-02	1.8637E-02	1.4599E-01	1.4599E-01	1.635E-01
EU-154	#B	7.5548E-03	7.5593E-03	9.5512E-02	9.5513E-02	1.074E-01
EU-155	#A	2.3668E-01	2.3692E-01	2.2938E-01	2.2975E-01	2.460E-01
HG-203	#B	8.0559E-04	8.3798E-04	3.6041E-02	3.6042E-02	3.964E-02
TL-208	#	2.3891E-01	2.3891E-01	6.2537E-02	6.4056E-02	
PB-212		7.2061E-01	7.2061E-01	1.3349E-01	1.3989E-01	
PB-214		4.3671E-01	4.3671E-01	1.0164E-01	1.0475E-01	
BI-212		4.6118E-01	4.6118E-01	4.4078E-01	4.4160E-01	
BI-214		4.2744E-01	4.2744E-01	1.4002E-01	1.4220E-01	
RA-224		1.1680E+00	1.1680E+00	1.0307E+00	1.0329E+00	1.096E+00
RA-226	#	1.4799E+00	1.4799E+00	1.0839E+00	1.0873E+00	1.147E+00
AC-228		6.7117E-01	6.7117E-01	1.8434E-01	1.8841E-01	
TH-227	#B	-1.1665E-01	-1.1665E-01	4.0228E-01	4.0233E-01	4.469E-01
PA-234	#B	9.8786E-02	9.8786E-02	2.0568E-01	2.0575E-01	2.267E-01
TH-234	#B	3.1528E-01	3.1528E-01	3.5206E-01	3.5250E-01	6.898E+00
AM-241	#A	-1.6238E-01	-1.6238E-01	1.1883E+00	1.1883E+00	1.291E+00

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.

H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (86.9 to 2000.7 keV) 1.7634058E+01 pCi/gm
Total Decayed Activity (86.9 to 2000.7 keV) 1.7634071E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
DAT

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

Sample description
FSS-OOL-05-06-006-F-RC

Spectrum Filename: C:\GammaVision\Spectra\103F_27JUL2006_1334.An1

Acquisition information

Start time:	27-Jul-2006 13:34:51
Live time:	2000
Real time:	2001
Dead time:	0.07 %
Detector ID:	4

Detector system
Det 103 - DSPE-471

Calibration

Filename:	D3_1LSa.Clb

Detector_103 1.0 Liter Sand Geometry

Energy Calibration

Created:	08-Aug-2005 11:09:41
Zero offset:	0.409 keV
Gain:	0.500 keV/channel
Quadratic:	1.092E-08 keV/channel^2

Efficiency Calibration

Created:	08-Aug-2005 11:11:25
Type:	Polynomial
Uncertainty:	0.993 %
Coefficients:	-0.264059 -5.138468 0.638383
	-0.089199 0.005011 -0.000129

Library Files

Main analysis library:	FSS_Rev_1.Lib
Library Match Width:	1.000
Peak stripping:	Library based

Analysis parameters

Analysis engine:	Env32 G53W4.20
Start channel:	100 (50.41keV)
Stop channel:	4000 (2000.67keV)
Peak rejection level:	41.667%
Peak search sensitivity:	3
Sample Size:	1.2910E+03
Activity scaling factor:	1.0000E+06/(1.0000E+00* 1.2910E+03) = 7.7459E+02
Detection limit method:	Nureg 4.16
Random error:	1.0000000E+00
Systematic error:	1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	24-Jul-2006 21:23:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	103_150K_05AUG05.Pbc 08-Aug-2005 12:54:15
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 18 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.1641

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
74.95	92.	23.58	0.99	9.052E-03	74.81	9.600	1.105E+00	PB212
77.25	129.	14.38	0.99	1.011E-02	77.11	10.700	1.268E+00	PB214
					77.11	17.500	7.751E-01	PB212
186.52	98.	29.76	1.13	2.565E-02	185.99	3.280	PBC<MDA	RA226
209.54	95.	29.07	0.99	2.470E-02				
238.94	719.	4.42	1.09	2.318E-02	238.63	43.100	7.402E-01	PB212
242.04	102.	20.29	1.10	2.302E-02	241.00	3.900	1.191E+00	RA224
					241.92	7.470	6.234E-01	PB214
270.35	60.	34.98	0.86	2.151E-02				
295.39	161.	11.16	1.13	2.024E-02	295.22	19.200	4.228E-01	PB214
300.00	70.	22.94	1.13	2.002E-02				
327.79	58.	40.98	1.51	1.875E-02				
338.36	170.	15.86	1.21	1.830E-02	338.40	12.010	8.020E-01	AC228
352.03	286.	8.24	1.21	1.775E-02	351.99	37.100	4.456E-01	PB214
462.71	43.	32.02	1.19	1.427E-02				
462.71	43.	32.02	1.19	1.427E-02	463.51	10.000	3.042E-01	SB125
510.91	137.	15.16	0.92	1.317E-02	510.72	22.500	3.907E-01	TL208
583.33	245.	7.86	1.25	1.184E-02	583.14	86.000	2.477E-01	TL208
609.50	221.	10.00	1.10	1.144E-02	609.32	46.090	4.257E-01	BI214
662.07	73.	24.61	1.36	1.072E-02	661.62	84.620	8.275E-02	CS137
727.36	60.	24.65	1.53	9.963E-03	727.17	11.800	5.333E-01	BI212
795.55	53.	19.61	1.78	9.303E-03				
795.55	53.	19.61	1.78	9.303E-03	795.76	85.400	6.937E-02	CS134
860.90	43.	31.24	0.82	8.765E-03				
911.29	157.	11.43	1.61	8.400E-03	911.07	29.000	6.601E-01	AC228
934.19	27.	33.71	0.98	8.246E-03				
964.41	32.	31.63	1.54	8.052E-03	964.00	14.580	PBC<MDA	EU152

969.44	83.	14.54	1.54	8.021E-03	968.90	17.460	6.211E-01	AC228
1120.55	52.	30.69	1.61	7.211E-03	1120.28	15.040	4.826E-01	BI214
1461.04	771.	3.67	1.89	5.931E-03	1460.75	10.700	1.241E+01	K40
1619.76	11.	40.49	1.02	5.488E-03	1620.56	2.750	PBC<MDA	BI212
1764.87	34.	17.72	0.92	5.142E-03	1764.51	15.920	4.313E-01	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
418.23	209.54	267.	95.	0.047	87.20	0.986	AC-228	s
539.86	270.35	162.	60.	0.030	104.95	0.863	AC-228	
599.13	299.99	184.	72.	0.036	96.84	1.431	TH-227	s
654.73	327.79	177.	58.	0.029	122.93	1.507	AC-228	s
1720.85	860.90	44.	43.	0.021	93.72	0.821	TL-208	s
1867.40	934.19	23.	27.	0.013	101.14	0.984	BI-214	s
1929.09	964.60	31.	36.	0.018	82.59	1.538	AC-228	D

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-212	148.79	74.81	206.	92.	0.046	70.75	0.993D
PB-212	153.39	77.11	214.	129.	0.064	43.14	0.995A
RA-226	371.73	186.28	393.	97.	0.048	80.72	1.500
PB-212	477.05	238.95	398.	762.	0.381	16.86	0.953
RA-224	482.56	241.70	447.	83.	0.041	113.60	1.500
PB-214	589.92	295.38	138.	142.	0.071	42.55	0.831
AC-228	675.87	338.36	180.	168.	0.084	47.59	1.213
PB-214	703.19	352.03	118.	280.	0.140	24.71	1.206
SB-125	925.67	463.27	54.	44.	0.022	82.22	1.500s
TL-208	1020.94	510.91	116.	111.	0.055	45.48	0.917
TL-208	1165.77	583.33	62.	241.	0.121	23.58	1.254
BI-214	1218.10	609.50	93.	214.	0.107	30.00	1.102
CS-137	1323.22	662.07	77.	72.	0.036	73.82	1.360s
BI-212	1453.79	727.36	58.	60.	0.030	73.95	1.526
CS-134	1589.93	795.44	25.	44.	0.022	65.62	1.500s
AC-228	1821.61	911.29	60.	154.	0.077	34.30	1.612
EU-152	1928.68	964.83	46.	35.	0.018	94.23	1.538s
AC-228	1936.81	968.90	32.	83.	0.042	43.50	1.541D
BI-214	2240.07	1120.55	67.	50.	0.025	92.07	1.608
K-40	2920.94	1461.04	25.	753.	0.376	11.00	1.892
BI-212	3238.33	1619.76	3.	11.	0.005	121.46	1.022s
BI-214	3528.50	1764.87	5.	34.	0.017	53.17	0.922s

s - Peak fails shape tests.
D - Peak area deconvoluted.

A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	MDA Value pCi/gm	COMMENTS
BE-7		2.6005E-02					
			477.56	2.601E-02	%(	3.182E-01 9.14E-02	G
K-40		1.2413E+01					
			1460.75	1.241E+01	(P	4.314E-01 4.66E-01	G
MN-54		6.7967E-03					
			834.81	6.797E-03	&(P	4.534E-02 1.31E-02	G
CO-57		2.3448E-03					
			122.07	2.345E-03	&(P	5.294E-02 1.57E-02	G K
			136.43	-7.868E-03	%	4.224E-01 1.25E-01	G
CO-60		-4.3684E-03					
			1332.51	-4.368E-03	&(P	5.587E-02 1.51E-02	G K
			1173.23	-2.930E-03	% P	5.777E-02 1.60E-02	G K
Sr-85		-1.7465E-02					
			514.00	-1.747E-02	&(	4.907E-02 1.47E-02	G
Kr-85		-3.9191E+02					
			513.99	-3.919E+02	&(	1.101E+03 3.30E+02	G
Y-88		-1.2308E-03					
			1836.01	-1.231E-03	&(P	3.611E-02 9.29E-03	G K
			898.02	-4.364E-03	& P	4.670E-02 1.32E-02	G
NB-94		2.6937E-03					
			871.10	2.694E-03	&(	4.072E-02 1.15E-02	G K
			702.50	9.657E-03	%	3.856E-02 1.13E-02	G K
Ag-108M		-1.6762E-02					
			722.95	-1.676E-02	%(	5.163E-02 1.54E-02	G K
			614.37	-1.325E-02	% P	4.679E-02 1.38E-02	G
			433.93	-4.488E-03	%	2.928E-02 8.46E-03	G
CD-109		1.0208E-01					
			88.04	1.021E-01	%(	2.222E+00 6.60E-01	G
SN-113		-5.9831E-03					
			391.71	-5.983E-03	%(	6.142E-02 1.80E-02	G K
			255.04	2.567E-01	&	1.697E+00 5.02E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	8.0927E-02						
		427.95	-8.703E-05	%(P	1.313E-01	3.79E-02	G K
		600.77	3.957E-02	% P	1.741E-01	5.07E-02	G
		636.15	7.877E-04	% P	3.298E-01	9.29E-02	G
		463.51	3.207E-01	*(P	2.729E-01	9.05E-02	G
		176.29	-9.484E-02	&	6.252E-01	1.86E-01	G
I-131	-8.4256E-04						
		364.48	-8.426E-04	&(P	5.412E-02	1.56E-02	G K
		636.97	2.909E-02	%	6.266E-01	1.78E-01	G
		284.29	-1.449E-01	% P	7.561E-01	2.24E-01	G
CS-134	1.7248E-02						
		604.66	-1.865E-02	&(	4.628E-02	1.39E-02	G K
		795.76	5.827E-02	@(P	3.419E-02	1.28E-02	G
		569.29	7.672E-02	% P	2.159E-01	6.39E-02	G
		801.84	2.901E-02	% P	4.061E-01	1.13E-01	G
CS-137	8.2747E-02						
		661.62	8.275E-02	*(P	5.040E-02	2.08E-02	G
CE-139	1.1704E-02						
		165.85	1.170E-02	%(	5.031E-02	1.50E-02	G
EU-152	1.1497E-01						
		121.78	1.551E-02	&(P	1.490E-01	4.42E-02	G K
		344.30	-1.705E-02	% P	1.227E-01	3.60E-02	G
		1408.08	0.000E+00	&	2.469E-01	6.83E-02	G
		964.00	3.144E-01	(P	3.057E-01	1.00E-01	G
		1112.07	2.834E-02	%	3.867E-01	1.10E-01	G
		778.90	5.317E-02	%	2.617E-01	7.55E-02	G
EU-154	2.0323E-02						
		123.10	2.032E-02	&(	1.128E-01	3.37E-02	G K
		1274.80	-1.898E-02	%	1.323E-01	3.76E-02	G
		723.30	-9.594E-02	%	2.600E-01	7.79E-02	G
		1004.80	6.293E-02	&	2.455E-01	7.17E-02	G
EU-155	1.5076E-01						
		86.45	1.508E-01	%(	2.531E-01	7.72E-02	G K
		105.31	4.832E-02	&	2.528E-01	7.55E-02	G
HG-203	-2.0562E-05						
		279.17	-2.056E-05	&(P	4.450E-02	1.30E-02	G K
		72.87	-5.639E-02	% P	2.524E+00	7.49E-01	G
		70.83	-1.447E+00	%	4.599E+00	1.38E+00	G
		82.50	-9.581E-01	%	4.315E+00	1.29E+00	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	2.4774E-01						
		583.14	2.477E-01	(P	4.046E-02	1.98E-02	G
		510.72	3.907E-01	+ P	1.871E-01	7.35E-02	G
PB-212	7.9145E-01						
		238.63	7.981E-01	(P	1.001E-01	4.56E-02	G K
							Energy duplication
		77.11	7.600E-01	} P	4.191E-01	1.09E-01	G
		74.81	1.105E+00	+ P	8.377E-01	2.69E-01	G
PB-214	4.2377E-01						
		351.99	4.456E-01	(P	8.463E-02	3.74E-02	G K
		295.22	3.816E-01	(P	1.548E-01	5.57E-02	G
							Energy duplication
		77.11	0.000E+00	} P	9.561E-01	0.00E+00	G
		241.92	4.405E-01	%	6.078E-01	1.87E-01	G
BI-212	5.7350E-01						
		727.17	5.333E-01	(P	3.403E-01	1.33E-01	G K
		1620.56	7.460E-01	(P	7.702E-01	3.03E-01	G
		785.42	6.520E-01	%	1.771E+00	5.27E-01	G
BI-214	4.3797E-01						
		609.32	4.257E-01	(P	9.440E-02	4.39E-02	G K
		1764.51	4.313E-01	(P	1.715E-01	8.39E-02	G
		1120.28	4.826E-01	(P	3.942E-01	1.54E-01	G
RA-224	9.6023E-01						
		241.00	9.602E-01	&(	1.178E+00	3.64E-01	G
RA-226	1.2022E+00						
		185.99	1.202E+00	(P	1.183E+00	3.67E-01	G
AC-228	6.7800E-01						
		911.07	6.601E-01	(P	1.672E-01	7.71E-02	G K
		968.90	6.225E-01	(P	2.161E-01	9.04E-02	G
		338.40	8.020E-01	(P	3.103E-01	1.28E-01	G
TH-227	3.3501E-02						
		236.00	3.350E-02	%(	3.341E-01	9.88E-02	G K
		256.25	-3.520E-02	& P	5.549E-01	1.63E-01	G
PA-234	-7.1190E-03						
		98.44	-7.119E-03	%(P	2.529E-01	7.49E-02	G K
		946.00	4.211E-02	% P	1.562E-01	4.52E-02	G
		131.28	9.240E-04	& P	2.284E-01	6.76E-02	G
		94.67	-1.470E-01	% P	4.603E-01	1.39E-01	G
		883.24	2.732E-02	%	2.866E-01	8.04E-02	G
		926.70	-6.000E-02	&	4.145E-01	1.19E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
		569.26	1.141E-01	% P	3.195E-01	9.46E-02	G
TH-234	1.5057E+00						
		63.29	1.506E+00	%(P	7.192E+00	2.14E+00	G K
		92.80	1.058E+00	% P	2.346E+00	7.05E-01	G
		92.38	1.292E+00	% P	2.768E+00	8.32E-01	G
AM-241	2.4746E-02						
		59.54	2.475E-02	&(P	1.404E+00	4.16E-01	G

(- This peak used in the nuclide activity average.

* - Peak is too wide, but only one peak in library.
! - Peak is part of a multiplet and this area went negative during deconvolution.
? - Peak is too narrow.
@ - Peak is too wide at FW25M, but ok at FWHM.
% - Peak fails sensitivity test.
$ - Peak identified, but first peak of this nuclide failed one or more qualification tests.
+ - Peak activity higher than counting uncertainty range.
- - Peak activity lower than counting uncertainty range.
= - Peak outside analysis energy range.
& - Calculated peak centroid is not close enough to the library energy centroid for positive identification.
P - Peakbackground subtraction
} - Peak is too close to another for the activity to be found directly.

Nuclide Codes:	Peak Codes:
T - Thermal Neutron Activation	G - Gamma Ray
F - Fast Neutron Activation	X - X-Ray
I - Fission Product	P - Positron Decay
N - Naturally Occurring Isotope	S - Single-Escape
P - Photon Reaction	D - Double-Escape
C - Charged Particle Reaction	K - Key Line
M - No MDA Calculation	A - Not in Average
R - Coincidence Corrected	C - Coincidence Peak
H - Halflife limit exceeded	

- -

***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	2.5118E-02	2.6005E-02	2.7430E-01	2.7430E-01	3.074E-01
K-40		1.2413E+01	1.2413E+01	1.3991E+00	1.5738E+00	
MN-54	#A	6.7565E-03	6.7967E-03	3.9249E-02	3.9251E-02	4.507E-02
CO-57	#B	2.3287E-03	2.3448E-03	4.7011E-02	4.7011E-02	5.258E-02
CO-60	#B	-4.3642E-03	-4.3684E-03	2.4022E-01	2.4022E-01	5.581E-02

Sr-85	#A	-1.6973E-02	-1.7465E-02	4.4131E-02	4.4142E-02	4.769E-02
Kr-85	#A	-3.9191E+02	-3.9191E+02	9.9011E+02	9.9037E+02	1.101E+03
Y-88	#B	-1.2096E-03	-1.2308E-03	3.4750E-02	3.4750E-02	3.549E-02
NB-94	#B	2.6937E-03	2.6937E-03	3.4527E-02	3.4527E-02	4.072E-02
Ag-108M	#B	-1.6762E-02	-1.6762E-02	4.6083E-02	4.6093E-02	5.162E-02
CD-109	#A	1.0166E-01	1.0208E-01	1.9813E+00	1.9813E+00	2.213E+00
SN-113	#B	-5.8875E-03	-5.9831E-03	5.3922E-02	5.3924E-02	6.044E-02
SB-125	#B	8.0779E-02	8.0927E-02	6.8483E-02	6.8644E-02	1.310E-01
I-131	#B	-6.6904E-04	-8.4256E-04	3.4817E-01	3.4817E-01	4.297E-02
CS-134	#B	1.7206E-02	1.7248E-02	1.1341E-02	1.1385E-02	4.617E-02
CS-137	#	8.2733E-02	8.2747E-02	6.2268E-02	6.2453E-02	
CE-139	#A	1.1547E-02	1.1704E-02	4.5144E-02	4.5149E-02	4.963E-02
EU-152	#B	1.1492E-01	1.1497E-01	1.1001E-01	1.1020E-01	1.489E-01
EU-154	#B	2.0311E-02	2.0323E-02	1.0096E-01	1.0097E-01	1.127E-01
EU-155	#B	1.5060E-01	1.5076E-01	2.3159E-01	2.3174E-01	2.528E-01
HG-203	#B	-1.9760E-05	-2.0562E-05	4.4762E-01	4.4762E-01	4.277E-02
TL-208		2.4774E-01	2.4774E-01	5.9468E-02	6.1182E-02	
PB-212		7.9145E-01	7.9145E-01	1.3551E-01	1.4308E-01	
PB-214		4.2377E-01	4.2377E-01	1.0681E-01	1.0960E-01	
BI-212		5.7350E-01	5.7350E-01	4.0991E-01	4.1126E-01	
BI-214		4.3797E-01	4.3797E-01	1.3534E-01	1.3770E-01	
RA-224	#A	9.6023E-01	9.6023E-01	1.0908E+00	1.0922E+00	1.178E+00
RA-226	#	1.2022E+00	1.2022E+00	1.1005E+00	1.1027E+00	1.183E+00
AC-228		6.7800E-01	6.7800E-01	1.6641E-01	1.7100E-01	
TH-227	#B	3.3501E-02	3.3501E-02	2.9634E-01	2.9635E-01	3.341E-01
PA-234	#B	-7.1190E-03	-7.1190E-03	4.3365E-01	4.3365E-01	2.529E-01
TH-234	#B	1.5057E+00	1.5057E+00	6.4276E+00	6.4281E+00	7.192E+00
AM-241	#A	2.4746E-02	2.4746E-02	1.2480E+00	1.2480E+00	1.404E+00

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (1120.0 to 2000.7 keV) 1.5647885E+01 pCi/gm
Total Decayed Activity (1120.0 to 2000.7 keV) 1.5647899E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
DAT

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 103F_27JUL2006_1415.An1

Sample description
FSS-OOL-05-06-020-F

Spectrum Filename: C:\GammaVision\Spectra\103F_27JUL2006_1415.An1

Acquisition information
Start time: 27-Jul-2006 14:15:30
Live time: 2000
Real time: 2002
Dead time: 0.09 %
Detector ID: 4

Detector system
Det 103 - DSPE-471

Calibration
Filename: D3_1LSa.Clb
Detector_103 1.0 Liter Sand Geometry

Energy Calibration
Created: 08-Aug-2005 11:09:41
Zero offset: 0.409 keV
Gain: 0.500 keV/channel
Quadratic: 1.092E-08 keV/channel^2

Efficiency Calibration
Created: 08-Aug-2005 11:11:25
Type: Polynomial
Uncertainty: 0.993 %
Coefficients: -0.264059 -5.138468 0.638383
-0.089199 0.005011 -0.000129

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.41keV)
Stop channel: 4000 (2000.67keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 1.6730E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.6730E+03) =
5.9773E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	24-Jul-2006 20:35:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	103_150K_05AUG05.Pbc 08-Aug-2005 12:54:15
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 17 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.2139

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
74.91	118.	21.34	0.99	9.052E-03	72.87	6.400	PBC<MDA	HG203
					74.81	9.600	1.101E+00	PB212
77.21	132.	16.40	0.99	1.011E-02	77.11	17.500	8.145E-01	PB212
					77.11	10.700	1.332E+00	PB214
186.49	119.	23.84	1.40	2.565E-02	185.99	3.280	1.019E+00	RA226
209.66	68.	36.20	1.09	2.470E-02				
238.94	844.	4.11	1.09	2.319E-02	238.63	43.100	6.723E-01	PB212
241.68	130.	18.40	1.09	2.304E-02	241.00	3.900	1.165E+00	RA224
					241.92	7.470	6.095E-01	PB214
270.00	74.	35.28	1.12	2.152E-02				
295.32	189.	12.81	1.02	2.024E-02	295.22	19.200	3.845E-01	PB214
300.92	80.	28.07	0.98	1.997E-02				
328.07	65.	33.29	0.95	1.874E-02				
338.47	176.	13.44	1.02	1.830E-02	338.40	12.010	6.446E-01	AC228
351.92	358.	7.93	1.17	1.776E-02	351.99	37.100	4.326E-01	PB214
462.90	78.	24.73	1.58	1.426E-02				
462.90	78.	24.73	1.58	1.426E-02	463.51	10.000	4.387E-01	SB125
511.00	148.	15.68	1.86	1.317E-02	510.72	22.500	3.307E-01	TL208
583.32	273.	8.81	1.32	1.184E-02	583.14	86.000	2.133E-01	TL208
609.49	302.	8.30	1.15	1.144E-02	609.32	46.090	4.528E-01	BI214
727.10	103.	19.51	1.13	9.965E-03	727.17	11.800	7.028E-01	BI212
768.34	41.	32.81	1.05	9.553E-03				
795.30	35.	30.21	1.50	9.301E-03	795.76	85.400	3.569E-02	CS134
911.25	211.	8.08	1.16	8.400E-03	911.07	29.000	6.871E-01	AC228
968.38	171.	13.04	1.94	8.029E-03	968.90	17.460	9.854E-01	AC228
1120.02	69.	25.38	1.52	7.213E-03	1120.28	15.040	5.012E-01	BI214
1461.15	1098.	3.17	2.03	5.931E-03	1460.75	10.700	1.373E+01	K40

1765.21	35.	16.88	1.74	5.142E-03	1764.51	15.920	3.476E-01	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
418.47	209.66	269.	68.	0.034	108.60	1.090	NP-239	s
539.16	270.00	243.	74.	0.037	105.83	1.119	AC-228	s
601.00	300.92	178.	80.	0.040	84.22	0.978	PB-212	s
655.29	328.07	168.	65.	0.032	99.87	0.950	AC-228	
1535.75	768.34	53.	41.	0.021	98.42	1.054	BI-214	M

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.
M - Peak is close to a library peak.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-212	148.79	74.81	279.	118.	0.059	64.03	0.993D
PB-212	153.39	77.11	280.	132.	0.066	49.20	0.995A
RA-226	372.14	186.49	341.	106.	0.053	71.52	1.399s
PB-212	477.09	238.97	532.	865.	0.432	16.34	1.028
RA-224	482.88	241.86	631.	104.	0.052	107.02	1.500s
PB-214	589.79	295.32	177.	185.	0.093	38.43	1.019s
AC-228	676.08	338.47	156.	175.	0.088	40.32	1.022
PB-214	702.97	351.92	172.	353.	0.176	23.80	1.175s
SB-125	924.81	462.84	86.	72.	0.036	64.14	1.500s
TL-208	1021.12	511.00	153.	121.	0.061	47.04	1.855s
TL-208	1165.73	583.32	103.	269.	0.134	26.42	1.315
BI-214	1218.07	609.49	102.	296.	0.148	24.90	1.153
BI-212	1453.27	727.10	84.	102.	0.051	58.53	1.129
CS-134	1589.65	795.30	39.	35.	0.018	90.64	1.500s
AC-228	1821.53	911.25	34.	207.	0.104	24.24	1.155s
AC-228	1935.78	968.38	99.	171.	0.085	39.11	1.938s
BI-214	2239.02	1120.02	77.	67.	0.034	76.15	1.524s
K-40	2921.18	1461.15	43.	1079.	0.539	9.50	2.031
BI-214	3529.18	1765.21	5.	35.	0.018	50.65	1.738

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	Peak MDA Value pCi/gm	COMMENTS
BE-7		-2.5586E-02					
			477.56	-2.559E-02	%(	3.113E-01 9.05E-02	G
K-40		1.3728E+01					
			1460.75	1.373E+01	(P	4.244E-01 4.42E-01	G
MN-54		7.5932E-03					
			834.81	7.593E-03	%(P	3.569E-02 1.04E-02	G
CO-57		1.0456E-02					
			122.07	1.046E-02	%(P	4.785E-02 1.43E-02	G K
			136.43	6.515E-03	%	3.819E-01 1.13E-01	G
CO-60		3.6464E-03					
			1332.51	3.646E-03	%(P	3.771E-02 1.04E-02	G K
			1173.23	-1.403E-03	% P	4.317E-02 1.20E-02	G K
Sr-85		-1.9293E-02					
			514.00	-1.929E-02	%(	4.575E-02 1.38E-02	G
Kr-85		-4.3257E+02					
			513.99	-4.326E+02	%(	1.026E+03 3.10E+02	G
Y-88		-1.6591E-03					
			1836.01	-1.659E-03	%(P	2.600E-02 6.69E-03	G K
			898.02	-1.271E-03	& P	3.202E-02 8.83E-03	G
NB-94		1.0729E-02					
			871.10	1.073E-02	&(	2.883E-02 8.59E-03	G K
			702.50	4.331E-03	%	2.920E-02 8.42E-03	G K
Ag-108M		-1.9816E-02					
			722.95	-1.982E-02	&(	4.853E-02 1.46E-02	G K
			614.37	-1.215E-02	% P	3.996E-02 1.19E-02	G
			433.93	3.226E-04	%	3.429E-02 9.92E-03	G
CD-109		6.7910E-02					
			88.04	6.791E-02	&(	1.658E+00 4.92E-01	G
SN-113		-4.3864E-03					
			391.71	-4.386E-03	%(	5.310E-02 1.56E-02	G K
			255.04	1.774E-02	&	1.271E+00 3.71E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	1.0244E-01						
		427.95	-3.534E-04	&(P	1.041E-01	3.01E-02	G K
		600.77	-8.166E-03	% P	1.377E-01	3.90E-02	G
		636.15	2.343E-03	& P	2.412E-01	6.78E-02	G
		463.51	4.067E-01	*(P	2.612E-01	8.85E-02	G
		176.29	7.209E-04	%	5.443E-01	1.61E-01	G
I-131	-9.2237E-05						
		364.48	-9.224E-05	%(P	4.467E-02	1.29E-02	G K
		636.97	-1.574E-02	&	4.979E-01	1.41E-01	G
		284.29	-1.172E-01	% P	6.563E-01	1.95E-01	G
CS-134	1.7474E-02						
		604.66	1.535E-03	%(	6.711E-02	1.98E-02	G K
		795.76	3.569E-02	*(P	3.234E-02	1.08E-02	G
		569.29	-2.371E-02	% P	2.007E-01	5.74E-02	G
		801.84	-8.615E-02	& P	3.926E-01	1.13E-01	G
CS-137	-4.9469E-03						
		661.62	-4.947E-03	%(P	4.476E-02	1.29E-02	G
CE-139	-1.3613E-02						
		165.85	-1.361E-02	&(	4.553E-02	1.37E-02	G
EU-152	3.0002E-02						
		121.78	3.000E-02	%(P	1.395E-01	4.18E-02	G K
		344.30	1.333E-02	% P	1.088E-01	3.20E-02	G
		1408.08	5.102E-02	%	1.219E-01	3.65E-02	G
		964.00	-3.749E-03	& P	5.120E-01	1.50E-01	G
		1112.07	1.429E-02	&	2.641E-01	7.42E-02	G
		778.90	4.946E-02	%	2.221E-01	6.46E-02	G
EU-154	2.6872E-02						
		123.10	2.687E-02	%(	1.031E-01	3.10E-02	G K
		1274.80	-4.075E-03	&	1.124E-01	3.15E-02	G
		723.30	2.464E-02	&	1.734E-01	5.03E-02	G
		1004.80	-4.508E-02	&	2.171E-01	6.32E-02	G
EU-155	6.0626E-02						
		86.45	6.063E-02	%(	1.898E-01	5.71E-02	G K
		105.31	7.263E-02	%	2.162E-01	6.51E-02	G
HG-203	2.1600E-02						
		279.17	2.160E-02	&(P	3.642E-02	1.11E-02	G K
		72.87	-7.766E-02	& P	2.186E+00	6.51E-01	G
		70.83	-6.750E-01	&	4.264E+00	1.28E+00	G
		82.50	-1.322E+00	%	3.695E+00	1.11E+00	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments

TL-208       2.1330E-01
                          583.14 2.133E-01  (P 3.965E-02 1.91E-02 G
                          510.72 3.307E-01 + P 1.643E-01 6.33E-02 G

PB-212       7.3212E-01
                          238.63 6.987E-01  (P 8.903E-02 3.86E-02 G K
                                                          Energy duplication
                           77.11 6.031E-01 } P 3.679E-01 9.89E-02 G
                           74.81 1.101E+00 + P 7.482E-01 2.41E-01 G

PB-214       4.1620E-01
                          351.99 4.326E-01 @(P 7.833E-02 3.49E-02 G K
                          295.22 3.845E-01 @(P 1.344E-01 5.03E-02 G
                                                          Energy duplication
                           77.11 3.181E-01 } P 8.939E-01 2.21E-01 G
                          241.92 4.048E-01 %   5.558E-01 1.70E-01 G

BI-212       7.0279E-01
                          727.17 7.028E-01  (P 3.115E-01 1.38E-01 G K
                         1620.56-5.456E-03 % P 9.538E-01 2.45E-01 G
                          785.42 7.142E-01 %   1.620E+00 4.89E-01 G

BI-214       4.6468E-01
                          609.32 4.528E-01  (P 7.642E-02 3.84E-02 G K
                         1764.51 3.476E-01 - P 1.272E-01 6.42E-02 G
                         1120.28 5.012E-01 *(P 3.241E-01 1.31E-01 G

RA-224       9.2989E-01
                          241.00 9.299E-01 &(  1.075E+00 3.32E-01 G

RA-226       1.0194E+00
                          185.99 1.019E+00  (P 8.514E-01 2.73E-01 G

AC-228       6.7462E-01
                          911.07 6.871E-01 @(P 9.876E-02 5.64E-02 G K
                          968.90 9.854E-01 + P 2.829E-01 1.29E-01 G
                          338.40 6.446E-01  (P 2.236E-01 8.72E-02 G

TH-227      -1.5355E-01
                          236.00-1.536E-01 %(  3.945E-01 1.19E-01 G K
                          256.25-6.195E-02 % P 4.802E-01 1.43E-01 G

PA-234      -2.2282E-03
                           98.44-2.228E-03 %(P 2.096E-01 6.21E-02 G K
                          946.00-9.301E-03 % P 1.794E-01 5.08E-02 G
                          131.28-4.400E-02 % P 2.114E-01 6.33E-02 G
                           94.67-2.907E-02 % P 3.931E-01 1.17E-01 G
                          883.24 4.961E-02 %   2.608E-01 7.53E-02 G
                          926.70 9.826E-02 %   2.817E-01 8.36E-02 G
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 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26-3.449E-02 % P 2.970E-01 8.49E-02 G

TH-234      -2.3595E-01
                           63.29-2.360E-01 %(P 6.332E+00 1.87E+00 G K
                           92.80 1.121E+00 % P 2.134E+00 6.45E-01 G
                           92.38 1.255E+00 % P 2.543E+00 7.68E-01 G

AM-241       1.1660E-01
                           59.54 1.166E-01 &(P 1.068E+00 3.18E-01 G
   ( - This peak used in the nuclide activity average.

   * - Peak is too wide, but only one peak in library.
   ! - Peak is part of a multiplet and this area went
       negative during deconvolution.
   ? - Peak is too narrow.
   @ - Peak is too wide at FW25M, but ok at FWHM.
   % - Peak fails sensitivity test.
   $ - Peak identified, but first peak of this nuclide
       failed one or more qualification tests.
   + - Peak activity higher than counting uncertainty range.
   - - Peak activity lower than counting uncertainty range.
   = - Peak outside analysis energy range.
   & - Calculated peak centroid is not close enough to the
       library energy centroid for positive identification.
   P - Peakbackground subtraction
   } - Peak is too close to another for the activity
       to be found directly.

   Nuclide Codes:                      Peak Codes:
   T - Thermal Neutron Activation      G - Gamma Ray
   F - Fast Neutron Activation         X - X-Ray
   I - Fission Product                 P - Positron Decay
   N - Naturally Occurring Isotope     S - Single-Escape
   P - Photon Reaction                 D - Double-Escape
   C - Charged Particle Reaction       K - Key Line
   M - No MDA Calculation              A - Not in Average
   R - Coincidence Corrected           C - Coincidence Peak
   H - Halflife limit exceeded

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
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***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	-2.4693E-02	-2.5586E-02	2.7148E-01	2.7149E-01	3.004E-01
K-40		1.3728E+01	1.3728E+01	1.3268E+00	1.5478E+00	
MN-54	#A	7.5472E-03	7.5932E-03	3.1219E-02	3.1222E-02	3.547E-02
CO-57	#B	1.0383E-02	1.0456E-02	4.3004E-02	4.3008E-02	4.752E-02
CO-60	#B	3.6428E-03	3.6464E-03	3.1236E-02	3.1237E-02	3.767E-02

Sr-85	#A	-1.8737E-02	-1.9293E-02	4.1439E-02	4.1454E-02	4.443E-02
Kr-85	#A	-4.3256E+02	-4.3257E+02	9.2908E+02	9.2942E+02	1.026E+03
Y-88	#B	-1.6299E-03	-1.6591E-03	2.2783E-02	2.2784E-02	2.554E-02
NB-94	#B	1.0729E-02	1.0729E-02	2.5762E-02	2.5769E-02	2.883E-02
Ag-108M	#B	-1.9815E-02	-1.9816E-02	4.3838E-02	4.3853E-02	4.853E-02
CD-109	#A	6.7627E-02	6.7910E-02	1.4768E+00	1.4768E+00	1.651E+00
SN-113	#B	-4.3147E-03	-4.3864E-03	4.6738E-02	4.6739E-02	5.223E-02
SB-125	#B	1.0225E-01	1.0244E-01	6.6877E-02	6.7141E-02	1.039E-01
I-131	#B	-7.2853E-05	-9.2237E-05	5.6453E-02	5.6453E-02	3.529E-02
CS-134	#B	1.7430E-02	1.7474E-02	1.5878E-02	1.5911E-02	6.694E-02
CS-137	#A	-4.9460E-03	-4.9469E-03	6.4452E-02	6.4453E-02	4.476E-02
CE-139	#A	-1.3426E-02	-1.3613E-02	4.1069E-02	4.1076E-02	4.490E-02
EU-152	#B	2.9989E-02	3.0002E-02	1.2529E-01	1.2530E-01	1.394E-01
EU-154	#B	2.6855E-02	2.6872E-02	9.2914E-02	9.2925E-02	1.031E-01
EU-155	#B	6.0563E-02	6.0626E-02	1.7129E-01	1.7132E-01	1.896E-01
HG-203	#B	2.0738E-02	2.1600E-02	3.3409E-02	3.3433E-02	3.497E-02
TL-208		2.1330E-01	2.1330E-01	5.7255E-02	5.8579E-02	
PB-212		7.3212E-01	7.3212E-01	1.2130E-01	1.2853E-01	
PB-214	#	4.1620E-01	4.1620E-01	9.5970E-02	9.8965E-02	
BI-212		7.0279E-01	7.0279E-01	4.1336E-01	4.1537E-01	
BI-214		4.6468E-01	4.6468E-01	1.1825E-01	1.2129E-01	
RA-224	#A	9.2989E-01	9.2989E-01	9.9515E-01	9.9661E-01	1.075E+00
RA-226		1.0194E+00	1.0194E+00	8.1799E-01	8.2013E-01	
AC-228		6.7462E-01	6.7462E-01	1.6011E-01	1.6483E-01	
TH-227	#B	-1.5355E-01	-1.5355E-01	3.5761E-01	3.5772E-01	3.945E-01
PA-234	#B	-2.2282E-03	-2.2282E-03	1.5293E+00	1.5293E+00	2.096E-01
TH-234	#B	-2.3595E-01	-2.3595E-01	6.6049E+01	6.6049E+01	6.332E+00
AM-241	#A	1.1660E-01	1.1660E-01	9.5314E-01	9.5316E-01	1.068E+00

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (86.4 to 2000.7 keV) 1.7951496E+01 pCi/gm
Total Decayed Activity (86.4 to 2000.7 keV) 1.7951500E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
DAT

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 103F_27JUL2006_1452.An1

Sample description
FSS-OOL-05-06-015-F

Spectrum Filename: C:\GammaVision\Spectra\103F_27JUL2006_1452.An1

Acquisition information
Start time: 27-Jul-2006 14:52:39
Live time: 2000
Real time: 2002
Dead time: 0.10 %
Detector ID: 4

Detector system
Det 103 - DSPE-471

Calibration
Filename: D3_1LSa.Clb
Detector_103 1.0 Liter Sand Geometry

Energy Calibration
Created: 08-Aug-2005 11:09:41
Zero offset: 0.409 keV
Gain: 0.500 keV/channel
Quadratic: 1.092E-08 keV/channel^2

Efficiency Calibration
Created: 08-Aug-2005 11:11:25
Type: Polynomial
Uncertainty: 0.993 %
Coefficients: -0.264059 -5.138468 0.638383
-0.089199 0.005011 -0.000129

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.41keV)
Stop channel: 4000 (2000.67keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 1.9600E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.9600E+03) =
5.1020E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	24-Jul-2006 21:26:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	103_150K_05AUG05.Pbc 08-Aug-2005 12:54:15
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 13 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.2427

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
74.98	132.	20.06	0.99	9.052E-03	74.81	9.600	1.046E+00	PB212
77.28	187.	12.38	0.99	1.011E-02	77.11	17.500	8.121E-01	PB212
87.40	99.	28.65	1.00	1.459E-02	86.45	32.740	1.481E-01	EU155
					88.04	3.790	1.229E+00	CD109
92.97	152.	18.70	1.00	1.661E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
185.90	158.	23.92	1.39	2.567E-02				
185.90	158.	23.92	1.39	2.567E-02	185.99	3.280	1.185E+00	RA226
209.39	143.	27.92	0.85	2.471E-02				
238.96	1053.	3.69	1.09	2.318E-02	238.63	43.100	7.180E-01	PB212
269.99	97.	30.79	1.62	2.152E-02				
276.97	55.	41.41	0.68	2.116E-02				
295.29	251.	12.72	0.98	2.025E-02	295.22	19.200	4.387E-01	PB214
300.38	73.	34.50	1.20	2.000E-02				
327.95	56.	39.50	0.95	1.874E-02				
338.49	230.	12.15	1.17	1.830E-02	338.40	12.010	7.180E-01	AC228
352.07	424.	7.10	1.18	1.775E-02	351.99	37.100	4.384E-01	PB214
463.65	75.	26.24	1.17	1.424E-02	463.51	10.000	3.594E-01	SB125
510.77	170.	17.37	1.15	1.317E-02	510.72	22.500	3.334E-01	TL208
583.34	324.	7.96	1.18	1.184E-02	583.14	86.000	2.165E-01	TL208
609.50	309.	8.75	1.33	1.144E-02	609.32	46.090	3.956E-01	BI214
727.17	88.	23.11	1.68	9.965E-03	727.17	11.800	5.119E-01	BI212
795.70	75.	18.88	1.63	9.302E-03				
795.70	75.	18.88	1.63	9.302E-03	795.76	85.400	6.545E-02	CS134
861.00	55.	28.23	1.04	8.764E-03				
911.70	244.	8.31	1.19	8.397E-03	911.07	29.000	6.798E-01	AC228
969.39	200.	14.30	1.49	8.023E-03	968.90	17.460	9.809E-01	AC228

1120.99	118.	17.15	1.96	7.208E-03	1120.28	15.040	7.361E-01	BI214
1191.70	48.	29.08	0.84	6.892E-03				
1461.19	1357.	2.77	1.91	5.931E-03	1460.75	10.700	1.454E+01	K40
1765.05	69.	12.04	1.67	5.141E-03	1764.51	15.920	5.536E-01	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
173.98	87.70	353.	99.	0.050	85.96	1.001	PB-214	lD
417.95	209.39	541.	143.	0.072	83.76	0.846	AC-228	s
484.03	242.42	242.	125.	0.062	59.34	1.095	XE-138	lD
539.12	269.99	318.	97.	0.049	92.37	1.617	AC-228	s
599.90	300.38	237.	73.	0.037	103.50	1.200	PB-212	
655.04	327.95	190.	56.	0.028	118.49	0.949	AC-228	s
1721.05	861.00	62.	55.	0.027	72.98	1.042	TL-208	s
2382.35	1191.70	58.	48.	0.024	87.25	0.835	-	s

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-212	148.79	74.81	302.	132.	0.066	60.18	0.993D
PB-212	153.39	77.11	331.	187.	0.094	37.14	0.995A
TH-234	185.15	92.99	854.	172.	0.086	68.37	1.500
TH-234	185.10	92.96	862.	148.	0.074	77.94	1.500
RA-226	371.68	186.26	673.	149.	0.074	71.50	1.500s
PB-212	477.02	238.93	653.	1008.	0.504	15.42	0.915
PB-214	589.72	295.29	290.	247.	0.124	38.16	0.976s
AC-228	676.11	338.49	205.	229.	0.114	36.45	1.168s
PB-214	703.23	352.04	222.	443.	0.222	22.13	1.181
SB-125	925.90	463.39	145.	59.	0.029	93.26	1.500s
TL-208	1020.65	510.77	222.	143.	0.072	52.11	1.148s
TL-208	1165.78	583.34	122.	320.	0.160	23.88	1.183s
BI-214	1218.10	609.50	138.	303.	0.151	26.26	1.333
BI-212	1453.41	727.17	102.	87.	0.044	69.32	1.676s
CS-134	1589.84	795.39	32.	47.	0.023	67.48	1.500s
AC-228	1822.43	911.70	63.	240.	0.120	24.93	1.189
AC-228	1937.80	969.39	137.	199.	0.100	42.90	1.490
BI-214	2240.96	1120.99	80.	116.	0.058	51.45	1.964s
K-40	2921.24	1461.19	34.	1338.	0.669	8.32	1.910
BI-214	3528.85	1765.05	3.	66.	0.033	36.12	1.667

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	MDA Value pCi/gm	COMMENTS
BE-7		3.3880E-02					
			477.56	3.388E-02	%(	2.928E-01 8.58E-02	G
K-40		1.4537E+01					
			1460.75	1.454E+01	(P	3.234E-01 4.09E-01	G
MN-54		3.4672E-03					
			834.81	3.467E-03	%(P	3.038E-02 8.73E-03	G
CO-57		-1.2385E-03					
			122.07	-1.238E-03	%(P	4.323E-02 1.28E-02	G K
			136.43	3.851E-02	&	3.546E-01 1.06E-01	G
CO-60		7.9450E-03					
			1332.51	7.945E-03	&(P	3.536E-02 1.01E-02	G K
			1173.23	-7.901E-03	% P	4.756E-02 1.37E-02	G K
Sr-85		-1.6571E-02					
			514.00	-1.657E-02	&(	4.172E-02 1.26E-02	G
Kr-85		-3.7157E+02					
			513.99	-3.716E+02	&(	9.354E+02 2.82E+02	G
Y-88		-1.0865E-03					
			1836.01	-1.086E-03	&(P	2.528E-02 6.60E-03	G K
			898.02	-3.973E-03	% P	3.845E-02 1.10E-02	G
NB-94		0.0000E+00					
			871.10	0.000E+00	&(	3.353E-02 9.52E-03	G K
			702.50	1.294E-02	%	3.037E-02 9.15E-03	G K
Ag-108M		2.8293E-03					
			722.95	2.829E-03	%(	2.524E-02 7.19E-03	G K
			614.37	-1.801E-02	% P	3.917E-02 1.19E-02	G
			433.93	-1.561E-05	&	3.245E-02 9.43E-03	G
CD-109		1.1567E+00					
			88.04	1.157E+00	%(	1.712E+00 5.23E-01	G
SN-113		-3.4594E-03					
			391.71	-3.459E-03	%(	4.899E-02 1.44E-02	G K
			255.04	-8.059E-02	%	1.488E+00 4.41E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	5.6726E-02						
		427.95	-2.019E-02	%(P	1.065E-01	3.16E-02	G K
		600.77	2.856E-03	& P	1.614E-01	4.64E-02	G
		636.15	3.638E-02	& P	2.789E-01	8.12E-02	G
		463.51	2.844E-01	*(P	2.851E-01	9.03E-02	G
		176.29	-1.403E-01	%	5.644E-01	1.70E-01	G
I-131	-1.2520E-02						
		364.48	-1.252E-02	&(P	4.639E-02	1.38E-02	G K
		636.97	-5.960E-03	%	5.217E-01	1.50E-01	G
		284.29	1.068E-02	& P	6.074E-01	1.79E-01	G
CS-134	-3.0388E-02						
		604.66	-3.039E-02	&(	4.103E-02	1.27E-02	G K
		795.76	4.051E-02	+ P	2.522E-02	9.13E-03	G
		569.29	1.940E-02	% P	1.935E-01	5.61E-02	G
		801.84	-9.200E-02	% P	2.870E-01	8.27E-02	G
CS-137	-1.2654E-02						
		661.62	-1.265E-02	%(P	3.679E-02	1.09E-02	G
CE-139	-5.5813E-03						
		165.85	-5.581E-03	%(	4.270E-02	1.28E-02	G
EU-152	-4.1934E-03						
		121.78	-4.193E-03	&(P	1.384E-01	4.12E-02	G K
		344.30	-5.857E-03	% P	1.036E-01	3.04E-02	G
		1408.08	9.828E-03	%	1.404E-01	3.89E-02	G
		964.00	1.757E-01	% P	2.740E-01	8.45E-02	G
		1112.07	7.929E-02	%	2.637E-01	7.79E-02	G
		778.90	-5.549E-03	%	2.081E-01	5.88E-02	G
EU-154	0.0000E+00						
		123.10	0.000E+00	%(	1.039E-01	3.09E-02	G K
		1274.80	3.630E-02	%	1.019E-01	3.03E-02	G
		723.30	-8.484E-02	%	2.124E-01	6.39E-02	G
		1004.80	-5.564E-03	&	2.255E-01	6.45E-02	G
EU-155	1.4805E-01						
		86.45	1.481E-01	%(	2.140E-01	6.54E-02	G K
		105.31	2.594E-02	%	2.173E-01	6.50E-02	G
HG-203	-3.7372E-03						
		279.17	-3.737E-03	&(P	3.977E-02	1.18E-02	G K
		72.87	-5.626E-01	% P	1.946E+00	5.86E-01	G
		70.83	6.919E-02	&	3.760E+00	1.12E+00	G
		82.50	-5.362E-01	%	3.505E+00	1.05E+00	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	2.1652E-01						
		583.14	2.165E-01	@(P	3.669E-02	1.75E-02	G
		510.72	3.334E-01	+ P	1.677E-01	6.87E-02	G
PB-212	7.2894E-01						
		238.63	6.952E-01	(P	8.397E-02	3.62E-02	G K
							Energy duplication
		77.11	7.289E-01	} P	3.406E-01	9.03E-02	G
		74.81	1.046E+00	+ P	6.640E-01	2.15E-01	G
PB-214	4.5543E-01						
		351.99	4.641E-01	(P	7.546E-02	3.47E-02	G K
		295.22	4.387E-01	@(P	1.455E-01	5.67E-02	G
							Energy duplication
		77.11	0.000E+00	} P	7.554E-01	0.00E+00	G
		241.92	-3.377E-02	%	5.209E-01	1.55E-01	G
BI-212	5.1192E-01						
		727.17	5.119E-01	(P	2.914E-01	1.19E-01	G K
		1620.56	3.149E-01	& P	7.417E-01	2.22E-01	G
		785.42	6.856E-01	%	1.347E+00	4.10E-01	G
BI-214	3.9562E-01						
		609.32	3.956E-01	(P	7.525E-02	3.54E-02	G K
		1764.51	5.536E-01	+ P	9.382E-02	7.00E-02	G
		1120.28	7.361E-01	+ P	2.825E-01	1.28E-01	G
RA-224	4.8940E-02						
		241.00	4.894E-02	&(	8.886E-01	2.64E-01	G
RA-226	1.2166E+00						
		185.99	1.217E+00	(P	1.012E+00	3.15E-01	G
AC-228	6.9102E-01						
		911.07	6.798E-01	(P	1.121E-01	5.73E-02	G K
		968.90	9.809E-01	+ P	2.814E-01	1.40E-01	G
		338.40	7.180E-01	@(P	2.178E-01	8.77E-02	G
TH-227	-1.2369E-01						
		236.00	-1.237E-01	&(	3.355E-01	1.01E-01	G K
		256.25	4.250E-02	% P	4.265E-01	1.26E-01	G
PA-234	-5.9337E-02						
		98.44	-5.934E-02	%(P	1.999E-01	6.01E-02	G K
		946.00	-5.539E-02	% P	1.946E-01	5.76E-02	G
		131.28	-2.675E-02	% P	2.048E-01	6.13E-02	G
		94.67	-1.031E-01	& P	3.817E-01	1.15E-01	G
		883.24	8.521E-03	&	2.244E-01	6.30E-02	G
		926.70	9.591E-02	&	2.566E-01	7.65E-02	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26 2.855E-02 % P 2.864E-01 8.31E-02 G

TH-234       1.9931E+00
                           63.29 1.387E+00 %(P 5.991E+00 1.79E+00 G K
                           92.80 2.069E+00  (P 1.949E+00 6.01E-01 G
                           92.38 2.825E+00  (P 2.285E+00 7.10E-01 G

AM-241      -2.3088E-01
                           59.54-2.309E-01 %(P 1.033E+00 3.10E-01 G
   ( - This peak used in the nuclide activity average.

   * - Peak is too wide, but only one peak in library.
   ! - Peak is part of a multiplet and this area went
       negative during deconvolution.
   ? - Peak is too narrow.
   @ - Peak is too wide at FW25M, but ok at FWHM.
   % - Peak fails sensitivity test.
   $ - Peak identified, but first peak of this nuclide
       failed one or more qualification tests.
   + - Peak activity higher than counting uncertainty range.
   - - Peak activity lower than counting uncertainty range.
   = - Peak outside analysis energy range.
   & - Calculated peak centroid is not close enough to the
       library energy centroid for positive identification.
   P - Peakbackground subtraction
   } - Peak is too close to another for the activity
       to be found directly.

   Nuclide Codes:                      Peak Codes:
   T - Thermal Neutron Activation      G - Gamma Ray
   F - Fast Neutron Activation         X - X-Ray
   I - Fission Product                 P - Positron Decay
   N - Naturally Occurring Isotope     S - Single-Escape
   P - Photon Reaction                 D - Double-Escape
   C - Charged Particle Reaction       K - Key Line
   M - No MDA Calculation              A - Not in Average
   R - Coincidence Corrected           C - Coincidence Peak
   H - Halflife limit exceeded

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
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***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	3.2701E-02	3.3880E-02	2.5726E-01	2.5726E-01	2.826E-01
K-40		1.4537E+01	1.4537E+01	1.2267E+00	1.4890E+00	
MN-54	#A	3.4463E-03	3.4672E-03	2.6177E-02	2.6178E-02	3.020E-02
CO-57	#B	-1.2299E-03	-1.2385E-03	4.9085E-02	4.9085E-02	4.293E-02
CO-60	#B	7.9372E-03	7.9450E-03	3.0340E-02	3.0344E-02	3.533E-02

Sr-85	#A	-1.6095E-02	-1.6571E-02	3.7729E-02	3.7741E-02	4.052E-02
Kr-85	#A	-3.7156E+02	-3.7157E+02	8.4599E+02	8.4626E+02	9.354E+02
Y-88	#B	-1.0674E-03	-1.0865E-03	2.3325E-02	2.3325E-02	2.483E-02
NB-94	#B	0.0000E+00	0.0000E+00	2.8570E-02	2.8570E-02	3.353E-02
Ag-108M	#B	2.8291E-03	2.8293E-03	2.1560E-02	2.1560E-02	2.524E-02
CD-109	#A	1.1518E+00	1.1567E+00	1.5695E+00	1.5708E+00	1.705E+00
SN-113	#B	-3.4031E-03	-3.4594E-03	4.3195E-02	4.3196E-02	4.820E-02
SB-125	#B	5.6620E-02	5.6726E-02	5.4053E-02	5.4153E-02	1.063E-01
I-131	#B	-9.8968E-03	-1.2520E-02	4.4386E-02	4.4392E-02	3.667E-02
CS-134	#B	-3.0312E-02	-3.0388E-02	3.8114E-02	3.8155E-02	4.093E-02
CS-137	#A	-1.2652E-02	-1.2654E-02	3.8565E-02	3.8572E-02	3.678E-02
CE-139	#A	-5.5051E-03	-5.5813E-03	3.8270E-02	3.8271E-02	4.212E-02
EU-152	#B	-4.1917E-03	-4.1934E-03	1.9723E-01	1.9723E-01	1.384E-01
EU-154	#B	0.0000E+00	0.0000E+00	9.2777E-02	9.2777E-02	1.038E-01
EU-155	#B	1.4790E-01	1.4805E-01	1.9627E-01	1.9644E-01	2.138E-01
HG-203	#B	-3.5886E-03	-3.7372E-03	3.5681E-02	3.5681E-02	3.819E-02
TL-208	#	2.1652E-01	2.1652E-01	5.2395E-02	5.3882E-02	
PB-212		7.2894E-01	7.2894E-01	1.1376E-01	1.2138E-01	
PB-214		4.5543E-01	4.5543E-01	1.0200E-01	1.0537E-01	
BI-212	#	5.1192E-01	5.1192E-01	3.5690E-01	3.5813E-01	
BI-214		3.9562E-01	3.9562E-01	1.0610E-01	1.0856E-01	
RA-224	#A	4.8940E-02	4.8940E-02	7.9223E-01	7.9223E-01	8.886E-01
RA-226	#	1.2166E+00	1.2166E+00	9.4569E-01	9.4832E-01	1.012E+00
AC-228		6.9102E-01	6.9102E-01	1.5376E-01	1.5891E-01	
TH-227	#B	-1.2369E-01	-1.2369E-01	3.0382E-01	3.0391E-01	3.355E-01
PA-234	#B	-5.9337E-02	-5.9337E-02	1.8963E-01	1.8966E-01	1.999E-01
TH-234	#B	1.9931E+00	1.9931E+00	1.5026E+00	1.5066E+00	5.991E+00
AM-241	#A	-2.3088E-01	-2.3088E-01	9.4277E-01	9.4286E-01	1.033E+00

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (87.4 to 2000.7 keV) 1.7536413E+01 pCi/gm
Total Decayed Activity (87.4 to 2000.7 keV) 1.7536413E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
DAT

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 107F_25JUL2006_1659.An1

Sample description
FSS-OOL-05-06-021-F-B

Spectrum Filename: C:\GammaVision\Spectra\107F_25JUL2006_1659.An1

Acquisition information
Start time: 25-Jul-2006 16:59:45
Live time: 2000
Real time: 2002
Dead time: 0.09 %
Detector ID: 2

Detector system
Det 107- DSPE- 634

Calibration
Filename: D7_1LSa.Clb
Detector 107 Calibration for 1 Liter Sand Marinelli

Energy Calibration
Created: 29-Oct-2004 06:48:53
Zero offset: 0.157 keV
Gain: 0.500 keV/channel
Quadratic: -1.676E-08 keV/channel^2

Efficiency Calibration
Created: 29-Oct-2004 06:51:32
Type: Polynomial
Uncertainty: 1.174 %
Coefficients: -0.279532 -4.778179 0.614896
-0.087174 0.005356 -0.000131

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.16keV)
Stop channel: 4000 (2000.15keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 1.8270E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.8270E+03) =
5.4735E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	25-Jul-2006 14:10:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	107_150K_28APR05.Pbc 01-May-2005 05:30:33
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 13 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.1564

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
74.67	230.	15.89	1.18	2.842E-02				
74.67	230.	15.89	1.18	2.842E-02	74.81	9.600	6.110E-01	PB212
77.03	374.	10.03	1.18	2.954E-02				
77.03	374.	10.03	1.18	2.954E-02	77.11	17.500	5.344E-01	PB212
					77.11	10.700	8.629E-01	PB214
86.93	135.	25.43	1.19	3.296E-02	86.45	32.740	9.257E-02	EU155
					88.04	3.790	PBC<MDA	CD109
90.19	73.	41.54	1.19	3.379E-02				
93.25	131.	23.75	1.19	3.447E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
186.24	163.	26.04	2.06	3.608E-02	185.99	3.280	1.018E+00	RA226
208.79	86.	30.98	1.18	3.433E-02				
238.76	832.	4.43	1.30	3.189E-02	238.63	43.100	4.394E-01	PB212
238.78	735.	5.52	1.50	3.163E-02	238.63	43.100	3.957E-01	PB212
241.74	139.	19.54	1.30	3.165E-02	241.00	3.900	8.156E-01	RA224
295.42	241.	9.31	1.34	2.767E-02	295.22	19.200	3.297E-01	PB214
300.35	59.	29.47	1.34	2.734E-02				
328.78	68.	33.77	1.05	2.556E-02				
338.45	179.	17.88	1.37	2.500E-02	338.40	12.010	4.330E-01	AC228
352.11	395.	6.75	1.47	2.425E-02	351.99	37.100	3.206E-01	PB214
510.94	182.	14.59	1.54	1.807E-02	510.72	22.500	2.693E-01	TL208
583.35	296.	8.59	1.40	1.629E-02	583.14	86.000	1.539E-01	TL208
609.51	322.	8.74	1.63	1.574E-02	609.32	46.090	3.239E-01	BI214
727.27	82.	21.59	1.42	1.374E-02	727.17	11.800	3.736E-01	BI212
795.46	38.	28.40	1.68	1.284E-02	795.76	85.400	2.585E-02	CS134
861.56	68.	33.92	1.25	1.210E-02				
911.49	209.	10.00	1.90	1.160E-02	911.07	29.000	4.499E-01	AC228

968.44	213.	11.41	1.79	1.110E-02	968.90	17.460	8.049E-01	AC228
1120.73	103.	21.79	1.62	9.967E-03	1120.28	15.040	5.017E-01	BI214
1461.25	1157.	3.05	2.28	8.189E-03	1460.75	10.700	9.727E+00	K40
1620.97	34.	25.57	1.30	7.569E-03	1620.56	2.750	1.212E+00	BI212
1764.57	67.	13.80	2.79	7.084E-03	1764.51	15.920	4.401E-01	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
149.01	74.67	552.	230.	0.115	47.68	1.178	BI-207	D
153.73	77.03	516.	374.	0.187	30.08	1.179	PB-214	D
173.52	86.91	518.	135.	0.067	76.30	1.187	BI-207	D
180.04	90.17	424.	73.	0.037	124.61	1.189	PB-214	D
186.16	93.23	416.	131.	0.065	71.26	1.191	U-235	D
417.23	208.79	297.	86.	0.043	92.93	1.182	LU-177	
477.15	238.74	265.	832.	0.416	13.30	1.297	PB-212	D
483.11	241.72	297.	139.	0.069	58.63	1.299	PB-214	D
600.18	300.28	206.	82.	0.041	91.41	1.319	PB-212	
657.18	328.78	174.	68.	0.034	101.30	1.048	LA-140	s
1722.68	861.56	102.	68.	0.034	73.10	1.246	TL-208	

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-212	149.24	74.79	1253.	201.	0.101	76.12	1.500s
PB-212	153.89	77.11	1154.	331.	0.165	46.60	1.500D
PB-214	153.89	77.11	1158.	326.	0.163	46.60	1.500D
EU-155	174.12	87.23	1043.	141.	0.071	100.15	1.500
TH-234	185.46	92.90	974.	134.	0.067	96.32	1.500s
TH-234	185.42	92.88	951.	125.	0.063	92.87	1.500s
RA-226	371.97	186.16	574.	120.	0.060	89.05	1.500s
PB-212	477.18	238.77	604.	798.	0.399	16.45	1.500s
PB-214	477.19	238.78	459.	735.	0.368	16.55	1.500
PB-214	590.45	295.41	257.	243.	0.121	33.24	1.500
AC-228	676.51	338.45	267.	176.	0.088	53.63	1.373s
PB-214	703.88	352.14	181.	389.	0.194	20.79	1.500
TL-208	1021.48	510.94	171.	148.	0.074	43.76	1.540s
TL-208	1166.27	583.35	105.	291.	0.146	25.76	1.399
BI-214	1218.59	609.51	131.	318.	0.159	26.21	1.633
BI-212	1454.10	727.27	76.	82.	0.041	64.76	1.424s
CS-134	1590.49	795.46	42.	38.	0.019	85.20	1.684
AC-228	1822.54	911.49	69.	205.	0.102	29.99	1.900
AC-228	1936.44	968.44	86.	211.	0.105	34.24	1.787s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
BI-214	2241.03	1120.73	93.	102.	0.051	65.38	1.617s
K-40	2922.09	1461.25	26.	1153.	0.576	9.15	2.281
BI-212	3241.56	1620.97	9.	34.	0.017	76.71	1.297s
BI-214	3528.80	1764.57	5.	67.	0.034	41.39	2.787s

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	Peak MDA Value pCi/gm	COMMENTS
BE-7		6.0007E-02					
			477.56	6.001E-02	%(	2.043E-01 6.08E-02	G
K-40		9.7270E+00					
			1460.75	9.727E+00	(P	2.251E-01 2.98E-01	G
MN-54		-5.5766E-03					
			834.81	-5.577E-03	%(P	2.674E-02 7.81E-03	G
CO-57		4.2998E-03					
			122.07	4.300E-03	&(P	2.988E-02 8.93E-03	G K
			136.43	-3.811E-02	& P	2.314E-01 6.92E-02	G
CO-60		-4.6979E-03					
			1332.51	-4.698E-03	&(P	2.617E-02 6.96E-03	G K
			1173.23	2.322E-03	% P	3.634E-02 1.04E-02	G K
Sr-85		-8.2148E-03					
			514.00	-8.215E-03	%(	2.817E-02 8.41E-03	G
Kr-85		-2.1801E+02					
			513.99	-2.180E+02	%(P	6.543E+02 1.94E+02	G
Y-88		-8.8279E-04					
			1836.01	-8.828E-04	&(P	1.892E-02 4.65E-03	G K
			898.02	1.954E-03	% P	2.295E-02 6.46E-03	G
NB-94		-8.3830E-05					
			871.10	-8.383E-05	%(P	2.417E-02 6.82E-03	G K
			702.50	5.862E-03	% P	2.040E-02 6.01E-03	G K
Ag-108M		-1.2889E-02					
			722.95	-1.289E-02	&(	3.247E-02 9.77E-03	G K
			614.37	-1.979E-02	%	3.143E-02 9.66E-03	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
		433.93	-3.732E-03	% P	2.261E-02	6.58E-03	G
CD-109	6.0584E-02						
		88.04	6.058E-02	%(P	9.783E-01	2.93E-01	G
SN-113	-5.3487E-03						
		391.71	-5.349E-03	%(P	3.113E-02	9.10E-03	G K
		255.04	-2.115E-01	%	1.082E+00	3.23E-01	G
SB-125	1.3038E-02						
		427.95	1.304E-02	&(P	6.527E-02	1.92E-02	G K
		600.77	7.257E-03	& P	1.076E-01	3.07E-02	G
		636.15	2.629E-03	% P	1.763E-01	4.99E-02	G
		463.51	1.163E-01	% P	1.874E-01	5.74E-02	G
		176.29	-7.381E-02	% P	3.797E-01	1.13E-01	G
I-131	3.4880E-03						
		364.48	3.488E-03	%(	2.368E-02	6.96E-03	G K
		636.97	2.561E-02	%	2.504E-01	7.16E-02	G
		284.29	7.660E-02	%	3.564E-01	1.06E-01	G
CS-134	9.7100E-03						
		604.66	-4.413E-03	%(P	2.400E-02	7.02E-03	G K
		795.76	2.585E-02	(P	2.219E-02	7.44E-03	G
		569.29	-1.718E-02	%	1.382E-01	4.02E-02	G
		801.84	1.512E-02	& P	2.576E-01	7.33E-02	G
CS-137	8.9026E-03						
		661.62	8.903E-03	&(P	2.707E-02	7.98E-03	G
CE-139	-6.2438E-03						
		165.85	-6.244E-03	%(P	3.061E-02	9.17E-03	G
EU-152	7.3021E-03						
		121.78	7.302E-03	&(P	8.594E-02	2.56E-02	G K
		344.30	-1.316E-02	% P	8.155E-02	2.41E-02	G
		1408.08	1.504E-02	% P	9.295E-02	2.58E-02	G
		964.00	-1.446E-03	% P	2.652E-01	7.67E-02	G
		1112.07	2.258E-03	& P	2.134E-01	6.03E-02	G
		778.90	1.778E-02	& P	1.897E-01	5.46E-02	G
EU-154	1.0844E-02						
		123.10	1.084E-02	&(P	6.369E-02	1.91E-02	G K
		1274.80	2.395E-02	% P	7.517E-02	2.22E-02	G
		723.30	-5.885E-02	& P	1.543E-01	4.63E-02	G
		1004.80	-7.940E-04	& P	1.581E-01	4.47E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
EU-155	9.7263E-02						
		86.45	9.726E-02	(	1.054E-01	3.25E-02	G K
							Energy duplication
		105.31	5.810E-02	% P	1.244E-01	3.77E-02	G
HG-203	8.0022E-03						
		279.17	8.002E-03	&(P	2.368E-02	7.10E-03	G K
		72.87	-9.152E-02	% P	7.936E-01	2.38E-01	G
		70.83	-6.860E-01	&	1.396E+00	4.24E-01	G
		82.50	-3.230E-01	%	1.609E+00	4.83E-01	G
TL-208	1.5388E-01						
		583.14	1.539E-01	(P	2.659E-02	1.34E-02	G
		510.72	2.693E-01	+ P	1.157E-01	4.82E-02	G
PB-212	4.4178E-01						
		238.63	4.293E-01	@(P	6.308E-02	2.40E-02	G K
							Energy duplication
		77.11	4.725E-01	*(	2.301E-01	7.34E-02	G
		74.81	5.438E-01	+ P	4.534E-01	1.41E-01	G
PB-214	3.2593E-01						
		351.99	3.196E-01	(P	5.373E-02	2.24E-02	G K
		295.22	3.382E-01	(P	1.077E-01	3.82E-02	G
							Energy duplication
		77.11	7.617E-01	+ P	3.771E-01	1.20E-01	G
		241.92	2.302E+00	+ P	3.212E-01	1.27E-01	G
BI-212	3.7362E-01						
		727.17	3.736E-01	*(P	1.978E-01	8.19E-02	G K
		1620.56	1.212E+00	+ P	5.904E-01	3.14E-01	G
		785.42	5.959E-01	% P	1.132E+00	3.44E-01	G
BI-214	3.2395E-01						
		609.32	3.239E-01	(P	5.718E-02	2.87E-02	G K
		1764.51	4.401E-01	+ P	8.540E-02	6.15E-02	G
		1120.28	5.017E-01	+ P	2.354E-01	1.10E-01	G
RA-224	3.8588E-01						
		241.00	3.859E-01	&(P	7.554E-01	2.29E-01	G
RA-226	7.4927E-01						
		185.99	7.493E-01	*(	7.142E-01	2.22E-01	G
AC-228	4.4496E-01						
		911.07	4.499E-01	(P	9.115E-02	4.59E-02	G K
		968.90	8.049E-01	+ P	1.756E-01	9.28E-02	G
		338.40	4.330E-01	*(P	1.943E-01	7.88E-02	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments

TH-227      -1.9303E-01
                          236.00-1.930E-01 %(P 2.873E-01 8.78E-02 G K
                          256.25-7.441E-02 % P 3.227E-01 9.60E-02 G

PA-234      -5.3056E-04
                           98.44-5.306E-04 &(  1.077E-01 3.20E-02 G K
                          946.00 2.303E-02 %   1.330E-01 3.86E-02 G
                          131.28 1.420E-02 &   1.232E-01 3.68E-02 G
                           94.67-5.919E-02 %   2.083E-01 6.27E-02 G
                          883.24-2.420E-02 %   1.923E-01 5.52E-02 G
                          926.70 1.899E-02 %   2.331E-01 6.67E-02 G
                          569.26-2.014E-02 %   1.985E-01 5.75E-02 G

TH-234       6.8330E-01
                           63.29 2.292E-01 %(P 1.404E+00 4.19E-01 G K
                           92.80 8.964E-01  (P 1.050E+00 3.21E-01 G
                           92.38 1.124E+00  (P 1.243E+00 3.82E-01 G

AM-241       2.2551E-02
                           59.54 2.255E-02 &(P 1.846E-01 5.52E-02 G
   ( - This peak used in the nuclide activity average.

   * - Peak is too wide, but only one peak in library.
   ! - Peak is part of a multiplet and this area went
       negative during deconvolution.
   ? - Peak is too narrow.
   @ - Peak is too wide at FW25M, but ok at FWHM.
   % - Peak fails sensitivity test.
   $ - Peak identified, but first peak of this nuclide
       failed one or more qualification tests.
   + - Peak activity higher than counting uncertainty range.
   - - Peak activity lower than counting uncertainty range.
   = - Peak outside analysis energy range.
   & - Calculated peak centroid is not close enough to the
       library energy centroid for positive identification.
   P - Peakbackground subtraction
   } - Peak is too close to another for the activity
       to be found directly.

   Nuclide Codes:                      Peak Codes:
   T - Thermal Neutron Activation      G - Gamma Ray
   F - Fast Neutron Activation         X - X-Ray
   I - Fission Product                 P - Positron Decay
   N - Naturally Occurring Isotope     S - Single-Escape
   P - Photon Reaction                 D - Double-Escape
   C - Charged Particle Reaction       K - Key Line
   M - No MDA Calculation              A - Not in Average
```

R - Coincidence Corrected C - Coincidence Peak
H - Halflife limit exceeded

- -

***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	5.9915E-02	6.0007E-02	1.8233E-01	1.8236E-01	2.039E-01
K-40		9.7270E+00	9.7270E+00	8.9380E-01	1.0625E+00	
MN-54	#A	-5.5751E-03	-5.5766E-03	2.5689E-02	2.5692E-02	2.674E-02
CO-57	#B	4.2985E-03	4.2998E-03	2.6802E-02	2.6803E-02	2.987E-02
CO-60	#B	-4.6977E-03	-4.6979E-03	1.0779E-01	1.0779E-01	2.617E-02
Sr-85	#A	-8.2044E-03	-8.2148E-03	2.5242E-02	2.5247E-02	2.814E-02
Kr-85	#A	-2.1801E+02	-2.1801E+02	7.5780E+02	7.5791E+02	6.543E+02
Y-88	#B	-8.8211E-04	-8.8279E-04	2.2680E-02	2.2680E-02	1.891E-02
NB-94	#B	-8.3830E-05	-8.3830E-05	5.5663E-03	5.5663E-03	2.417E-02
Ag-108M	#B	-1.2889E-02	-1.2889E-02	2.9299E-02	2.9309E-02	3.247E-02
CD-109	#A	6.0573E-02	6.0584E-02	8.7800E-01	8.7800E-01	9.782E-01
SN-113	#B	-5.3449E-03	-5.3487E-03	3.8884E-02	3.8885E-02	3.111E-02
SB-125	#B	1.3037E-02	1.3038E-02	5.7541E-02	5.7547E-02	6.527E-02
I-131	#B	3.4528E-03	3.4880E-03	2.0892E-02	2.0893E-02	2.344E-02
CS-134	#B	9.7089E-03	9.7100E-03	8.3865E-03	8.4061E-03	2.400E-02
CS-137	#A	8.9026E-03	8.9026E-03	2.3951E-02	2.3957E-02	2.707E-02
CE-139	#A	-6.2401E-03	-6.2438E-03	2.8256E-02	2.8258E-02	3.059E-02
EU-152	#B	7.3020E-03	7.3021E-03	7.6880E-02	7.6882E-02	8.594E-02
EU-154	#B	1.0844E-02	1.0844E-02	5.7199E-02	5.7202E-02	6.369E-02
EU-155	#A	9.7258E-02	9.7263E-02	9.7405E-02	9.7554E-02	1.054E-01
HG-203	#B	7.9882E-03	8.0022E-03	2.1290E-02	2.1295E-02	2.364E-02
TL-208		1.5388E-01	1.5388E-01	4.0258E-02	4.1271E-02	
PB-212	#	4.4178E-01	4.4178E-01	7.4107E-02	7.8566E-02	6.308E-02
PB-214	#	3.2593E-01	3.2593E-01	6.4984E-02	6.7775E-02	5.373E-02
BI-212		3.7362E-01	3.7362E-01	2.4575E-01	2.4674E-01	
BI-214		3.2395E-01	3.2395E-01	8.6049E-02	8.8151E-02	
RA-224	#A	3.8588E-01	3.8588E-01	6.8772E-01	6.8810E-01	7.554E-01
RA-226	#	7.4927E-01	7.4927E-01	6.6722E-01	6.6868E-01	7.142E-01
AC-228		4.4496E-01	4.4496E-01	1.3620E-01	1.3871E-01	
TH-227	#B	-1.9303E-01	-1.9303E-01	2.6486E-01	2.6511E-01	2.873E-01
PA-234	#B	-5.3056E-04	-5.3056E-04	9.6005E-02	9.6005E-02	1.077E-01
TH-234	#B	6.8330E-01	6.8330E-01	6.9733E-01	6.9836E-01	1.404E+00
AM-241	#A	2.2551E-02	2.2551E-02	1.6569E-01	1.6569E-01	1.846E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.

H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (295.2 to 2000.1 keV) 1.1023402E+01 pCi/gm
Total Decayed Activity (295.2 to 2000.1 keV) 1.1023402E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
DAT

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 107F_26JUL2006_1911.An1

Sample description
FSS-OOL-05-06-009-F

Spectrum Filename: C:\GammaVision\Spectra\107F_26JUL2006_1911.An1

Acquisition information
Start time: 26-Jul-2006 19:11:27
Live time: 2000
Real time: 2002
Dead time: 0.12 %
Detector ID: 2

Detector system
Det 107- DSPE- 634

Calibration
Filename: D7_1LSa.Clb
Detector 107 Calibration for 1 Liter Sand Marinelli

Energy Calibration
Created: 29-Oct-2004 06:48:53
Zero offset: 0.157 keV
Gain: 0.500 keV/channel
Quadratic: -1.676E-08 keV/channel^2

Efficiency Calibration
Created: 29-Oct-2004 06:51:32
Type: Polynomial
Uncertainty: 1.174 %
Coefficients: -0.279532 -4.778179 0.614896
-0.087174 0.005356 -0.000131

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.16keV)
Stop channel: 4000 (2000.15keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 1.6540E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.6540E+03) =
6.0459E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	24-Jul-2006 21:15:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	107_150K_28APR05.Pbc 01-May-2005 05:30:33
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 22 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.2154

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
62.93	127.	36.91	1.55	1.977E-02				
62.93	127.	36.91	1.55	1.977E-02	63.29	3.900	PBC<MDA	TH234
74.79	389.	11.00	1.18	2.849E-02	74.81	9.600	1.163E+00	PB212
77.09	497.	7.49	1.18	2.957E-02	77.11	10.700	1.594E+00	PB214
					77.11	17.500	9.820E-01	PB212
86.41	143.	27.46	1.19	3.284E-02				
86.41	143.	27.46	1.19	3.284E-02	86.45	32.740	1.089E-01	EU155
89.56	136.	27.28	1.19	3.366E-02				
93.47	226.	16.35	1.19	3.453E-02	92.38	2.570	2.022E+00	TH234
					92.80	3.000	1.634E+00	TH234
129.15	139.	37.52	1.62	3.818E-02				
129.15	139.	37.52	1.62	3.818E-02	131.28	20.000	1.487E-01	PA234
185.90	227.	19.15	1.35	3.611E-02	185.99	3.280	1.569E+00	RA226
209.55	142.	24.50	1.40	3.426E-02				
238.78	1335.	3.37	1.30	3.188E-02	238.63	43.100	7.838E-01	PB212
242.02	231.	14.77	1.30	3.163E-02	241.00	3.900	1.512E+00	RA224
					241.92	7.470	7.940E-01	PB214
270.36	124.	31.08	1.36	2.944E-02				
295.41	333.	8.13	1.34	2.768E-02	295.22	19.200	5.054E-01	PB214
300.74	73.	28.50	1.34	2.732E-02				
328.11	75.	32.61	1.20	2.560E-02				
338.56	300.	12.96	1.50	2.499E-02	338.40	12.010	8.086E-01	AC228
352.09	573.	7.76	1.59	2.425E-02	351.99	37.100	5.159E-01	PB214
463.03	122.	24.80	1.32	1.954E-02				
463.03	122.	24.80	1.32	1.954E-02	463.51	10.000	4.981E-01	SB125
510.88	240.	13.38	1.54	1.808E-02	510.72	22.500	4.138E-01	TL208
583.37	482.	7.08	1.83	1.628E-02	583.14	86.000	2.783E-01	TL208

609.54	437.	8.02	1.90	1.574E-02	609.32	46.090	4.872E-01	BI214
727.65	148.	19.63	2.03	1.374E-02	727.17	11.800	7.392E-01	BI212
768.98	50.	40.02	0.70	1.317E-02				
795.13	66.	25.58	1.25	1.285E-02				
795.13	66.	25.58	1.25	1.285E-02	795.76	85.400	4.902E-02	CS134
860.65	109.	19.42	1.78	1.211E-02				
911.55	354.	7.72	1.78	1.160E-02	911.07	29.000	8.499E-01	AC228
964.72	57.	21.26	1.80	1.113E-02				
969.30	175.	9.70	1.80	1.109E-02	968.90	17.460	7.275E-01	AC228
1120.91	123.	16.35	2.04	9.966E-03	1120.28	15.040	6.637E-01	BI214
1461.25	1804.	2.37	2.33	8.189E-03	1460.75	10.700	1.677E+01	K40
1620.99	36.	20.19	0.81	7.569E-03	1620.56	2.750	1.405E+00	BI212

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
1765.47	83.	10.91	2.83	7.084E-03	1764.51	15.920	6.021E-01	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
125.53	62.93	894.	127.	0.063	110.74	1.548	PA-234	l
172.48	86.45	702.	143.	0.072	82.37	1.186	BI-207	lD
178.78	89.60	625.	136.	0.068	81.85	1.189	PB-214	lD
418.73	209.55	467.	142.	0.071	73.51	1.398	AC-228	
540.34	270.36	466.	124.	0.062	93.24	1.360	AC-228	
600.63	300.50	254.	78.	0.039	99.49	1.784	PB-212	sM
655.83	328.11	229.	75.	0.038	97.84	1.197	AC-228	
1537.53	768.98	116.	50.	0.025	99.67	0.701	BI-214	s
1720.86	860.65	91.	105.	0.052	48.55	1.781	TL-208	s
1929.99	964.87	46.	57.	0.028	64.37	1.797	AC-228	D

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.
M - Peak is close to a library peak.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-212	149.29	74.81	743.	389.	0.195	33.00	1.178D
PB-212	153.89	77.11	819.	497.	0.248	22.46	1.179A
TH-234	185.95	93.14	1374.	225.	0.112	70.14	1.500s
TH-234	185.93	93.14	1334.	214.	0.107	68.63	1.500s
PA-234	257.91	129.13	737.	102.	0.051	116.41	1.500s
RA-226	371.44	185.90	642.	227.	0.114	57.44	1.351s
PB-212	476.89	238.63	301.	1319.	0.659	9.81	1.297D
RA-224	483.39	241.88	948.	156.	0.078	85.67	1.500
PB-214	483.47	241.92	471.	227.	0.113	44.90	1.299D
PB-214	590.19	295.28	496.	439.	0.220	31.81	1.594s
AC-228	676.73	338.56	361.	297.	0.149	38.89	1.497
PB-214	703.79	352.09	375.	568.	0.284	23.27	1.587
SB-125	926.17	463.29	166.	71.	0.035	81.42	1.500s
TL-208	1021.36	510.88	247.	206.	0.103	40.15	1.541s
TL-208	1166.32	583.37	184.	477.	0.239	21.23	1.831
BI-214	1218.66	609.54	202.	433.	0.216	24.07	1.896s
Ag-108M	1223.41	611.92	316.	-96.	-0.048	84.47	1.561s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
BI-212	1454.87	727.65	175.	147.	0.073	58.89	2.027s
CS-134	1589.78	795.11	72.	71.	0.036	61.47	1.684
AC-228	1822.67	911.55	108.	350.	0.175	23.15	1.780
AC-228	1937.36	968.90	81.	172.	0.086	31.27	1.799D
BI-214	2241.39	1120.91	91.	122.	0.061	49.06	2.038
K-40	2922.10	1461.25	14.	1799.	0.899	7.12	2.328
BI-212	3241.60	1620.99	4.	36.	0.018	60.56	0.815s
BI-214	3530.59	1765.47	1.	83.	0.042	32.73	2.833s

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	Peak MDA Value pCi/gm	COMMENTS
BE-7		3.4001E-02					
			477.56	3.400E-02	%(	2.224E-01 6.51E-02 G	
K-40		1.6768E+01					
			1460.75	1.677E+01	(P	1.891E-01 3.99E-01 G	
MN-54		-2.2075E-03					
			834.81	-2.208E-03	&(P	3.480E-02 1.01E-02 G	
CO-57		6.9384E-03					
			122.07	6.938E-03	%(P	3.884E-02 1.17E-02 G K	
			136.43	3.231E-03	& P	2.900E-01 8.64E-02 G	
CO-60		-8.4651E-03					
			1332.51	-8.465E-03	%(P	3.466E-02 9.65E-03 G K	
			1173.23	-3.534E-03	% P	6.206E-02 1.80E-02 G K	
Sr-85		-2.1764E-02					
			514.00	-2.176E-02	%(	3.968E-02 1.21E-02 G	
Kr-85		-5.2386E+02					
			513.99	-5.239E+02	%(P	9.017E+02 2.73E+02 G	
Y-88		3.0321E-03					
			1836.01	3.032E-03	%(P	2.582E-02 7.02E-03 G K	
			898.02	-8.236E-03	% P	3.624E-02 1.06E-02 G	
NB-94		6.5872E-03					
			871.10	6.587E-03	%(P	1.728E-02 5.13E-03 G K	
			702.50	9.487E-03	% P	3.018E-02 8.98E-03 G K	

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
Ag-108M	-7.1607E-03						
		722.95	-7.161E-03	%(	4.134E-02	1.22E-02	G K
		614.37	-5.539E-02	+	4.946E-02	1.56E-02	G
		433.93	-4.026E-03	% P	3.000E-02	8.79E-03	G
CD-109	1.8676E-02						
		88.04	1.868E-02	%(P	1.248E+00	3.73E-01	G
SN-113	-4.2677E-03						
		391.71	-4.268E-03	%(P	3.891E-02	1.14E-02	G K
		255.04	3.251E-01	%	1.278E+00	3.83E-01	G
SB-125	7.3388E-02						
		427.95	-2.122E-03	&(P	7.040E-02	2.02E-02	G K
		600.77	-4.752E-03	% P	1.560E-01	4.48E-02	G
		636.15	-4.504E-02	% P	2.374E-01	6.94E-02	G
		463.51	2.969E-01	@(P	2.628E-01	8.38E-02	G
		176.29	-8.398E-02	% P	4.750E-01	1.42E-01	G
I-131	2.4253E-03						
		364.48	2.425E-03	&(	3.362E-02	9.85E-03	G K
		636.97	-3.521E-02	%	3.851E-01	1.11E-01	G
		284.29	3.842E-02	%	5.285E-01	1.56E-01	G
CS-134	1.5421E-02						
		604.66	-1.749E-02	%(P	3.740E-02	1.13E-02	G K
		795.76	5.303E-02	(P	3.160E-02	1.09E-02	G
		569.29	9.066E-03	%	1.719E-01	4.98E-02	G
		801.84	2.434E-02	% P	3.536E-01	1.02E-01	G
CS-137	-2.6819E-03						
		661.62	-2.682E-03	&(P	3.766E-02	1.08E-02	G
CE-139	8.3862E-04						
		165.85	8.386E-04	&(P	3.604E-02	1.07E-02	G
EU-152	2.2470E-02						
		121.78	2.247E-02	%(P	1.119E-01	3.36E-02	G K
		344.30	1.104E-04	% P	1.014E-01	2.98E-02	G
		1408.08	4.108E-02	% P	1.190E-01	3.49E-02	G
		964.00	-1.777E-01	% P	3.688E-01	1.12E-01	G
		1112.07	9.899E-02	% P	2.929E-01	8.73E-02	G
		778.90	5.917E-02	& P	2.226E-01	6.57E-02	G
EU-154	1.6518E-02						
		123.10	1.652E-02	%(P	7.669E-02	2.30E-02	G K
		1274.80	-8.507E-04	% P	1.319E-01	3.79E-02	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          723.30-1.822E-02 & P 1.789E-01 5.22E-02 G
                         1004.80-2.126E-02 & P 2.112E-01 6.12E-02 G

EU-155       1.0119E-01
                                                            Energy duplication
                           86.45 1.012E-01 %(  1.419E-01 4.33E-02 G K
                          105.31 3.713E-02 % P 1.614E-01 4.85E-02 G

HG-203       9.9776E-03
                          279.17 9.978E-03 %(P 3.193E-02 9.58E-03 G K
                           72.87-4.758E-01 & P 1.094E+00 3.31E-01 G
                           70.83 5.587E-01 %   1.570E+00 4.74E-01 G
                           82.50-8.282E-01 &   2.142E+00 6.48E-01 G

TL-208       2.7834E-01
                          583.14 2.783E-01  (P 3.842E-02 1.99E-02 G
                          510.72 4.138E-01 + P 1.525E-01 6.44E-02 G

PB-212       7.8381E-01
                          238.63 7.838E-01  (P 4.968E-02 2.59E-02 G K
                                                            Energy duplication
                           77.11 7.838E-01 }   2.148E-01 5.87E-02 G
                           74.81 1.163E+00 + P 3.874E-01 1.29E-01 G

PB-214       5.1590E-01
                          351.99 5.159E-01  (P 8.435E-02 4.04E-02 G K
                          295.22 6.751E-01 + P 1.637E-01 7.23E-02 G
                                                            Energy duplication
                           77.11 2.788E-01 } P 4.432E-01 1.36E-01 G
                          241.92 7.845E-01 + P 3.591E-01 1.18E-01 G

BI-212       7.3917E-01
                          727.17 7.392E-01  (P 3.245E-01 1.46E-01 G K
                         1620.56 1.405E+00 + P 4.813E-01 2.88E-01 G
                          785.42 5.322E-01 % P 1.702E+00 5.06E-01 G

BI-214       5.1671E-01
                          609.32 4.872E-01  (P 7.769E-02 3.95E-02 G K
                         1764.51 6.021E-01  (P 5.340E-02 6.64E-02 G
                         1120.28 6.637E-01 + P 2.572E-01 1.09E-01 G

RA-224       1.0330E+00
                          241.00 1.033E+00  (P 9.661E-01 2.99E-01 G

RA-226       1.5690E+00
                          185.99 1.569E+00 *(  8.331E-01 3.00E-01 G

AC-228       8.0475E-01
                          911.07 8.499E-01  (P 1.240E-01 6.64E-02 G K
                          968.90 7.272E-01  (P 1.879E-01 7.68E-02 G
                          338.40 8.086E-01  (P 2.482E-01 1.06E-01 G
```

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TH-227	-1.7951E-01						
		236.00	-1.795E-01	%(P	3.453E-01	1.05E-01	G K
		256.25	6.873E-02	% P	4.030E-01	1.20E-01	G
PA-234	5.2089E-02						
		98.44	6.496E-03	%(	1.418E-01	4.23E-02	G K
		946.00	-2.005E-02	&	1.774E-01	5.16E-02	G
		131.28	1.093E-01	&(	1.380E-01	4.24E-02	G
		94.67	-1.049E-01	%	2.534E-01	7.67E-02	G
		883.24	-7.960E-02	%	2.825E-01	8.38E-02	G
		926.70	5.994E-02	%	2.327E-01	6.82E-02	G
		569.26	1.340E-02	%	2.545E-01	7.38E-02	G
TH-234	1.5339E+00						
		63.29	1.046E+00	%(P	1.771E+00	5.38E-01	G K
		92.80	1.696E+00	(P	1.370E+00	4.24E-01	G
		92.38	2.085E+00	(P	1.626E+00	5.05E-01	G
AM-241	-2.6802E-02						
		59.54	-2.680E-02	&(P	2.431E-01	7.28E-02	G

(- This peak used in the nuclide activity average.

* - Peak is too wide, but only one peak in library.
! - Peak is part of a multiplet and this area went negative during deconvolution.
? - Peak is too narrow.
@ - Peak is too wide at FW25M, but ok at FWHM.
% - Peak fails sensitivity test.
$ - Peak identified, but first peak of this nuclide failed one or more qualification tests.
\+ - Peak activity higher than counting uncertainty range.
\- - Peak activity lower than counting uncertainty range.
= - Peak outside analysis energy range.
& - Calculated peak centroid is not close enough to the library energy centroid for positive identification.
P - Peakbackground subtraction
} - Peak is too close to another for the activity to be found directly.

Nuclide Codes:	Peak Codes:
T - Thermal Neutron Activation	G - Gamma Ray
F - Fast Neutron Activation	X - X-Ray
I - Fission Product	P - Positron Decay
N - Naturally Occurring Isotope	S - Single-Escape
P - Photon Reaction	D - Double-Escape
C - Charged Particle Reaction	K - Key Line
M - No MDA Calculation	A - Not in Average

R - Coincidence Corrected C - Coincidence Peak
H - Halflife limit exceeded

- -

***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	3.3167E-02	3.4001E-02	1.9536E-01	1.9537E-01	2.170E-01
K-40		1.6768E+01	1.6768E+01	1.1967E+00	1.5533E+00	
MN-54	#A	-2.1981E-03	-2.2075E-03	3.9103E-02	3.9103E-02	3.465E-02
CO-57	#B	6.9044E-03	6.9384E-03	3.4964E-02	3.4966E-02	3.865E-02
CO-60	#B	-8.4593E-03	-8.4651E-03	6.9922E-02	6.9924E-02	3.464E-02
Sr-85	#A	-2.1323E-02	-2.1764E-02	3.6261E-02	3.6284E-02	3.888E-02
Kr-85	#A	-5.2385E+02	-5.2386E+02	9.2547E+02	9.2598E+02	9.017E+02
Y-88	#B	2.9946E-03	3.0321E-03	2.1049E-02	2.1050E-02	2.550E-02
NB-94	#B	6.5872E-03	6.5872E-03	1.5402E-02	1.5407E-02	1.728E-02
Ag-108M	#B	-7.1605E-03	-7.1607E-03	3.6606E-02	3.6609E-02	4.134E-02
CD-109	#A	1.8621E-02	1.8676E-02	1.1204E+00	1.1204E+00	1.244E+00
SN-113	#B	-4.2188E-03	-4.2677E-03	5.6233E-02	5.6233E-02	3.846E-02
SB-125	#F	7.3292E-02	7.3388E-02	6.2129E-02	6.2280E-02	7.031E-02
I-131	#B	2.0564E-03	2.4253E-03	2.9559E-02	2.9559E-02	2.851E-02
CS-134	#B	1.5394E-02	1.5421E-02	9.5505E-03	9.5938E-03	3.733E-02
CS-137	#A	-2.6816E-03	-2.6819E-03	4.3254E-01	4.3254E-01	3.765E-02
CE-139	#A	8.3057E-04	8.3862E-04	3.2157E-02	3.2157E-02	3.569E-02
EU-152	#B	2.2464E-02	2.2470E-02	1.0084E-01	1.0084E-01	1.119E-01
EU-154	#B	1.6511E-02	1.6518E-02	6.9077E-02	6.9083E-02	7.666E-02
EU-155	#B	1.0112E-01	1.0119E-01	1.2998E-01	1.3010E-01	1.418E-01
HG-203	#B	9.6974E-03	9.9776E-03	2.8728E-02	2.8735E-02	3.104E-02
TL-208		2.7834E-01	2.7834E-01	5.9660E-02	6.1883E-02	
PB-212		7.8381E-01	7.8381E-01	7.7832E-02	9.0558E-02	
PB-214		5.1590E-01	5.1590E-01	1.2112E-01	1.2489E-01	
BI-212		7.3917E-01	7.3917E-01	4.3911E-01	4.4127E-01	
BI-214		5.1671E-01	5.1671E-01	1.0607E-01	1.1037E-01	
RA-224	#	1.0330E+00	1.0330E+00	8.9769E-01	8.9976E-01	9.661E-01
RA-226	#	1.5690E+00	1.5690E+00	9.0120E-01	9.0595E-01	
AC-228		8.0475E-01	8.0475E-01	1.4931E-01	1.5669E-01	
TH-227	#B	-1.7951E-01	-1.7951E-01	3.1677E-01	3.1694E-01	3.453E-01
PA-234	#B	5.2089E-02	5.2089E-02	6.0636E-02	6.0705E-02	1.418E-01
TH-234	#B	1.5339E+00	1.5339E+00	9.5193E-01	9.5573E-01	1.771E+00
AM-241	#A	-2.6802E-02	-2.6802E-02	2.3366E-01	2.3366E-01	2.431E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.

H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (1120.2 to 2000.1 keV) 2.1976019E+01 pCi/gm
Total Decayed Activity (1120.2 to 2000.1 keV) 2.1976021E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
DAT

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

Sample description
FSS-OOL-05-06-010-F

Spectrum Filename: C:\GammaVision\Spectra\107F_26JUL2006_1948.An1

Acquisition information

Start time:	26-Jul-2006 19:48:29
Live time:	2000
Real time:	2002
Dead time:	0.10 %
Detector ID:	2

Detector system
Det 107- DSPE- 634

Calibration

Filename:	D7_1LSa.Clb

Detector 107 Calibration for 1 Liter Sand Marinelli

Energy Calibration

Created:	29-Oct-2004 06:48:53
Zero offset:	0.157 keV
Gain:	0.500 keV/channel
Quadratic:	-1.676E-08 keV/channel^2

Efficiency Calibration

Created:	29-Oct-2004 06:51:32
Type:	Polynomial
Uncertainty:	1.174 %
Coefficients:	-0.279532 -4.778179 0.614896
	-0.087174 0.005356 -0.000131

Library Files

Main analysis library:	FSS_Rev_1.Lib
Library Match Width:	1.000
Peak stripping:	Library based

Analysis parameters

Analysis engine:	Env32 G53W4.20
Start channel:	100 (50.16keV)
Stop channel:	4000 (2000.15keV)
Peak rejection level:	41.667%
Peak search sensitivity:	3
Sample Size:	1.4850E+03
Activity scaling factor:	1.0000E+06/(1.0000E+00* 1.4850E+03) = 6.7340E+02
Detection limit method:	Nureg 4.16
Random error:	1.0000000E+00
Systematic error:	1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	24-Jul-2006 20:20:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	107_150K_28APR05.Pbc 01-May-2005 05:30:33
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 23 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.1834

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
69.73	132.	36.00	1.50	2.625E-02	70.83	3.520	PBC<MDA	HG203
74.81	315.	12.15	1.18	2.849E-02	74.81	9.600	1.049E+00	PB212
77.10	135.	34.57	1.50	2.957E-02	77.11	17.500	PBC<MDA	PB212
					77.11	10.700	PBC<MDA	PB214
77.11	259.	13.71	1.18	2.957E-02	77.11	17.500	8.297E-01	PB212
					77.11	10.700	1.343E+00	PB214
86.88	203.	17.09	1.19	3.300E-02	86.45	32.740	1.719E-01	EU155
					88.04	3.790	1.467E+00	CD109
90.00	143.	23.24	1.19	3.379E-02				
90.00	143.	23.24	1.19	3.379E-02	92.38	2.570	PBC<MDA	TH234
93.16	196.	16.95	1.19	3.449E-02	92.80	3.000	1.554E+00	TH234
129.03	136.	30.17	1.16	3.818E-02				
185.71	202.	19.20	1.75	3.612E-02	185.99	3.280	1.556E+00	RA226
209.67	125.	26.81	1.48	3.425E-02				
238.76	1251.	3.52	1.30	3.187E-02	238.63	43.100	8.174E-01	PB212
242.03	167.	15.94	1.30	3.161E-02	241.00	3.900	1.214E+00	RA224
					241.92	7.470	6.386E-01	PB214
270.12	129.	27.20	2.02	2.945E-02				
277.89	85.	32.75	0.84	2.889E-02	279.17	81.500	3.343E-02	HG203
295.49	237.	10.14	1.34	2.766E-02	295.22	19.200	3.978E-01	PB214
300.60	99.	19.24	1.34	2.732E-02				
327.88	84.	29.56	1.25	2.561E-02				
338.60	262.	14.24	1.32	2.499E-02	338.40	12.010	7.854E-01	AC228
352.05	442.	9.04	1.51	2.426E-02	351.99	37.100	4.418E-01	PB214
463.17	47.	34.41	1.50	1.953E-02	463.51	10.000	PBC<MDA	SB125
511.02	218.	13.25	1.36	1.807E-02	510.72	22.500	4.117E-01	TL208
583.36	416.	6.37	1.69	1.629E-02	583.14	86.000	2.675E-01	TL208

609.53	330.	8.77	1.60	1.574E-02	609.32	46.090	4.088E-01	BI214
662.30	168.	13.81	1.77	1.476E-02	661.62	84.620	1.200E-01	CS137
727.57	167.	15.72	0.97	1.374E-02	727.17	11.800	9.294E-01	BI212
769.48	70.	23.39	1.35	1.317E-02				
795.46	42.	32.06	1.68	1.284E-02	795.76	85.400	PBC<MDA	CS134
859.98	78.	23.82	1.22	1.212E-02				
911.53	294.	7.24	1.74	1.160E-02	911.07	29.000	7.847E-01	AC228

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
965.58	62.	22.36	1.80	1.112E-02	964.00	14.580	PBC<MDA	EU152
969.34	178.	9.24	1.80	1.109E-02	968.90	17.460	8.278E-01	AC228
1120.87	153.	19.00	1.70	9.966E-03	1120.28	15.040	9.207E-01	BI214
1461.28	1491.	2.64	2.31	8.189E-03	1460.75	10.700	1.543E+01	K40
1765.03	49.	15.92	1.27	7.084E-03	1764.51	15.920	3.946E-01	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
173.40	87.04	508.	203.	0.101	51.70	1.187	BI-207	D
179.65	90.17	483.	144.	0.072	69.47	1.189	PB-214	D
185.96	93.32	453.	196.	0.098	50.70	1.191	U-235	D
257.72	129.03	619.	164.	0.082	68.66	1.157	AC-228	s
418.99	209.67	419.	125.	0.063	80.42	1.482	NP-239	s
539.87	270.12	380.	129.	0.064	81.59	2.023	AC-228	s
600.59	300.49	162.	92.	0.046	67.55	0.812	PB-212	sM
655.38	327.88	213.	84.	0.042	88.68	1.251	AC-228	s
1538.54	769.48	66.	70.	0.035	60.91	1.347	BI-214	
1719.53	859.98	78.	78.	0.039	71.47	1.219	TL-208	s
1931.75	965.69	75.	52.	0.026	81.47	1.797	TB-160	D

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.
M - Peak is close to a library peak.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
HG-203	139.13	69.73	1070.	132.	0.066	108.00	1.500
PB-212	149.29	74.81	596.	315.	0.158	36.44	1.178D
PB-212	153.89	77.11	678.	259.	0.130	41.13	1.179A
PB-214	153.89	77.11	1152.	135.	0.067	103.70	1.500A
EU-155	173.91	87.12	1250.	175.	0.087	88.80	1.500s
TH-234	185.79	93.07	1121.	156.	0.078	83.43	1.500
RA-226	371.07	185.71	524.	202.	0.101	57.59	1.749s
TH-227	472.59	236.48	1257.	-162.	-0.081	96.13	1.500s
PB-212	476.89	238.63	301.	1226.	0.613	10.28	1.297D
RA-224	481.71	241.04	770.	102.	0.051	117.07	1.500s
PB-214	483.47	241.92	452.	164.	0.082	59.18	1.299D
HG-203	555.40	277.89	277.	84.	0.042	98.25	0.838s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
PB-214	590.39	295.38	207.	257.	0.128	30.98	1.570s
AC-228	676.81	338.60	337.	259.	0.130	42.73	1.325s
PB-214	703.72	352.05	335.	437.	0.218	27.12	1.509
SB-125	925.93	463.17	126.	47.	0.024	103.24	1.500s
TL-208	1021.63	511.02	220.	184.	0.092	39.76	1.361s
TL-208	1166.30	583.36	107.	412.	0.206	19.11	1.688
BI-214	1218.63	609.53	142.	326.	0.163	26.32	1.598s
CS-137	1324.18	662.30	116.	165.	0.082	41.43	1.773s
BI-212	1454.70	727.57	128.	166.	0.083	47.15	0.972s
CS-134	1590.48	795.46	72.	42.	0.021	96.19	1.684s
AC-228	1822.62	911.53	64.	290.	0.145	21.73	1.737
AC-228	1937.36	968.90	76.	175.	0.088	30.40	1.799D
BI-214	2241.30	1120.87	141.	152.	0.076	57.00	1.696s
K-40	2922.16	1461.28	16.	1486.	0.743	7.91	2.310
BI-214	3529.72	1765.03	5.	49.	0.024	47.75	1.267s

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	MDA Value pCi/gm	COMMENTS
BE-7		4.2629E-02					
			477.56	4.263E-02	%(	2.641E-01 7.76E-02	G
K-40		1.5428E+01					
			1460.75	1.543E+01	(P	2.225E-01 4.08E-01	G
MN-54		-6.8246E-03					
			834.81	-6.825E-03	%(P	3.506E-02 1.02E-02	G
CO-57		6.2323E-03					
			122.07	6.232E-03	&(P	3.789E-02 1.13E-02	G K
			136.43	-4.982E-02	& P	2.994E-01 8.96E-02	G
CO-60		3.6536E-03					
			1332.51	3.654E-03	%(P	3.412E-02 9.49E-03	G K
			1173.23	3.909E-03	& P	3.942E-02 1.12E-02	G K
Sr-85		-1.9654E-02					
			514.00	-1.965E-02	&(	4.276E-02 1.29E-02	G
Kr-85		-4.7954E+02					
			513.99	-4.795E+02	&(P	9.713E+02 2.93E+02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
Y-88	-2.7169E-03						
		1836.01	-2.717E-03	%(P	2.766E-02	7.23E-03	G K
		898.02	1.140E-03	% P	3.734E-02	1.06E-02	G
NB-94	-2.6913E-03						
		871.10	-2.691E-03	&(P	2.960E-02	8.47E-03	G K
		702.50	5.899E-03	% P	2.865E-02	8.38E-03	G K
Ag-108M	-1.6907E-03						
		722.95	-1.691E-03	%(	7.103E-02	2.10E-02	G K
		614.37	-1.672E-02	%	3.778E-02	1.14E-02	G
		433.93	-9.150E-04	& P	2.994E-02	8.64E-03	G
CD-109	-4.0849E-02						
		88.04	-4.085E-02	%(P	1.300E+00	3.89E-01	G
SN-113	7.2248E-03						
		391.71	7.225E-03	%(P	4.250E-02	1.25E-02	G K
		255.04	-2.371E-01	%	1.397E+00	4.16E-01	G
SB-125	3.7772E-02						
		427.95	-2.388E-02	%(P	8.925E-02	2.64E-02	G K
		600.77	2.885E-02	% P	1.579E-01	4.62E-02	G
		636.15	7.229E-03	% P	2.435E-01	6.97E-02	G
		463.51	2.203E-01	(P	2.567E-01	8.03E-02	G
		176.29	8.945E-02	% P	4.562E-01	1.36E-01	G
I-131	5.9959E-03						
		364.48	5.996E-03	&(	4.041E-02	1.19E-02	G K
		636.97	2.970E-02	%	4.506E-01	1.30E-01	G
		284.29	-6.670E-03	&	5.646E-01	1.66E-01	G
CS-134	-2.1728E-02						
		604.66	-2.173E-02	%(P	3.900E-02	1.19E-02	G K
		795.76	3.487E-02	+ P	3.513E-02	1.13E-02	G
		569.29	5.138E-02	&	1.832E-01	5.44E-02	G
		801.84	7.614E-03	% P	3.729E-01	1.07E-01	G
CS-137	1.1997E-01						
		661.62	1.200E-01	*(P	3.855E-02	1.69E-02	G
CE-139	6.3213E-04						
		165.85	6.321E-04	%(P	3.878E-02	1.15E-02	G
EU-152	2.3065E-02						
		121.78	2.307E-02	&(P	1.120E-01	3.36E-02	G K
		344.30	-1.453E-02	% P	1.107E-01	3.27E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
		1408.08	1.694E-02	& P	1.373E-01	3.84E-02	G
		964.00	8.289E-03	% P	3.868E-01	1.13E-01	G
		1112.07	-6.811E-02	& P	2.589E-01	7.57E-02	G
		778.90	3.401E-03	% P	2.198E-01	6.23E-02	G
EU-154	1.4783E-02						
		123.10	1.478E-02	&(P	7.461E-02	2.23E-02	G K
		1274.80	-3.331E-03	% P	1.041E-01	2.93E-02	G
		723.30	-1.070E-01	& P	2.331E-01	7.05E-02	G
		1004.80	2.115E-02	% P	1.746E-01	5.00E-02	G
EU-155	1.4800E-01						
		86.45	1.480E-01	(	1.419E-01	4.38E-02	G K
		105.31	4.606E-02	& P	1.587E-01	4.78E-02	G
HG-203	3.3429E-02						
		279.17	3.343E-02	@(P	3.207E-02	1.11E-02	G K
		72.87	-8.182E-01	% P	1.129E+00	3.45E-01	G
		70.83	1.343E+00	+	1.574E+00	4.84E-01	G
		82.50	-6.583E-01	%	2.199E+00	6.63E-01	G
TL-208	2.6753E-01						
		583.14	2.675E-01	(P	3.309E-02	1.72E-02	G
		510.72	4.117E-01	+ P	1.607E-01	6.46E-02	G
PB-212	8.1700E-01						
		238.63	8.118E-01	(P	5.528E-02	2.82E-02	G K
							Energy duplication
		77.11	4.561E-01	}	2.181E-01	6.25E-02	G
		74.81	1.049E+00	+ P	3.874E-01	1.29E-01	G
PB-214	4.4100E-01						
		351.99	4.418E-01	(P	8.900E-02	4.04E-02	G K
		295.22	4.396E-01	*(P	1.196E-01	4.62E-02	G
							Energy duplication
		77.11	3.871E-01	} P	4.626E-01	1.34E-01	G
		241.92	6.320E-01	+ P	3.920E-01	1.26E-01	G
BI-212	9.2935E-01						
		727.17	9.294E-01	*(P	3.115E-01	1.47E-01	G K
		1620.56	5.401E-02	% P	9.812E-01	2.64E-01	G
		785.42	4.155E-01	% P	1.558E+00	4.58E-01	G
BI-214	4.0519E-01						
		609.32	4.088E-01	@(P	7.305E-02	3.64E-02	G K
		1764.51	3.946E-01	@(P	1.068E-01	6.40E-02	G
		1120.28	9.207E-01	+ P	3.526E-01	1.76E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
RA-224	7.4709E-01						
		241.00	7.471E-01	?(P	9.715E-01	2.98E-01	G
RA-226	1.5562E+00						
		185.99	1.556E+00	(	8.402E-01	2.99E-01	G
AC-228	7.9671E-01						
		911.07	7.847E-01	(P	1.079E-01	5.77E-02	G K
		968.90	8.245E-01	(P	2.030E-01	8.46E-02	G
		338.40	7.854E-01	*(P	2.674E-01	1.13E-01	G
TH-227	-4.0915E-01						
		236.00	-4.091E-01	?(P	4.249E-01	1.31E-01	G K
		256.25	-6.278E-03	% P	3.949E-01	1.16E-01	G
PA-234	1.0902E-02						
		98.44	1.090E-02	%(	1.462E-01	4.37E-02	G K
		946.00	0.000E+00	&	2.041E-01	5.86E-02	G
		131.28	-3.832E-02	&	1.750E-01	5.26E-02	G
		94.67	-1.263E-01	%	2.697E-01	8.18E-02	G
		883.24	-4.845E-02	%	2.729E-01	7.95E-02	G
		926.70	-6.328E-02	%	3.209E-01	9.39E-02	G
		569.26	7.598E-02	&	2.713E-01	8.05E-02	G
TH-234	8.5361E-01						
		63.29	4.540E-01	%(P	1.792E+00	5.37E-01	G K
		92.80	1.373E+00	(P	1.400E+00	4.30E-01	G
		92.38	1.445E-01	% P	1.541E+00	4.60E-01	G
AM-241	-4.9938E-02						
		59.54	-4.994E-02	%(P	2.117E-01	6.35E-02	G

(- This peak used in the nuclide activity average.

* - Peak is too wide, but only one peak in library.
! - Peak is part of a multiplet and this area went negative during deconvolution.
? - Peak is too narrow.
@ - Peak is too wide at FW25M, but ok at FWHM.
% - Peak fails sensitivity test.
$ - Peak identified, but first peak of this nuclide failed one or more qualification tests.
+ - Peak activity higher than counting uncertainty range.
- - Peak activity lower than counting uncertainty range.
= - Peak outside analysis energy range.
& - Calculated peak centroid is not close enough to the library energy centroid for positive identification.

P - Peakbackground subtraction
} - Peak is too close to another for the activity
to be found directly.

Nuclide Codes:	Peak Codes:
T - Thermal Neutron Activation	G - Gamma Ray
F - Fast Neutron Activation	X - X-Ray
I - Fission Product	P - Positron Decay
N - Naturally Occurring Isotope	S - Single-Escape
P - Photon Reaction	D - Double-Escape
C - Charged Particle Reaction	K - Key Line
M - No MDA Calculation	A - Not in Average
R - Coincidence Corrected	C - Coincidence Peak
H - Halflife limit exceeded	

- -

***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	4.1549E-02	4.2629E-02	2.3266E-01	2.3267E-01	2.574E-01
K-40		1.5428E+01	1.5428E+01	1.2245E+00	1.5263E+00	
MN-54	#A	-6.7946E-03	-6.8246E-03	3.3735E-02	3.3738E-02	3.491E-02
CO-57	#B	6.2007E-03	6.2323E-03	3.4030E-02	3.4031E-02	3.770E-02
CO-60	#B	3.6510E-03	3.6536E-03	2.8462E-02	2.8462E-02	3.410E-02
Sr-85	#A	-1.9243E-02	-1.9654E-02	3.8848E-02	3.8865E-02	4.186E-02
Kr-85	#A	-4.7953E+02	-4.7954E+02	1.0172E+03	1.0176E+03	9.713E+02
Y-88	#B	-2.6822E-03	-2.7169E-03	5.1164E-02	5.1164E-02	2.731E-02
NB-94	#B	-2.6913E-03	-2.6913E-03	2.7420E-02	2.7420E-02	2.960E-02
Ag-108M	#B	-1.6907E-03	-1.6907E-03	6.2959E-02	6.2959E-02	7.103E-02
CD-109	#A	-4.0725E-02	-4.0849E-02	1.3068E+00	1.3068E+00	1.296E+00
SN-113	#B	7.1392E-03	7.2248E-03	3.7576E-02	3.7578E-02	4.200E-02
SB-125	#B	3.7721E-02	3.7772E-02	4.1319E-02	4.1379E-02	8.913E-02
I-131	#B	5.0558E-03	5.9959E-03	3.5829E-02	3.5831E-02	3.407E-02
CS-134	#B	-2.1689E-02	-2.1728E-02	3.6668E-02	3.6690E-02	3.893E-02
CS-137	#	1.1996E-01	1.1997E-01	5.0770E-02	5.1263E-02	
CE-139	#A	6.2586E-04	6.3213E-04	3.4575E-02	3.4575E-02	3.840E-02
EU-152	#B	2.3059E-02	2.3065E-02	1.0076E-01	1.0076E-01	1.119E-01
EU-154	#B	1.4776E-02	1.4783E-02	6.7040E-02	6.7045E-02	7.457E-02
EU-155	#	1.4789E-01	1.4800E-01	1.3142E-01	1.3168E-01	1.417E-01
HG-203		3.2460E-02	3.3429E-02	3.3354E-02	3.3412E-02	
TL-208		2.6753E-01	2.6753E-01	5.1693E-02	5.4054E-02	
PB-212		8.1700E-01	8.1700E-01	8.5073E-02	9.7804E-02	
PB-214		4.4100E-01	4.4100E-01	9.2166E-02	9.5775E-02	
BI-212	#	9.2935E-01	9.2935E-01	4.4158E-01	4.4497E-01	
BI-214	#	4.0519E-01	4.0519E-01	1.0807E-01	1.1068E-01	
RA-224	#A	7.4709E-01	7.4709E-01	8.9383E-01	8.9492E-01	9.715E-01
RA-226		1.5562E+00	1.5562E+00	8.9625E-01	9.0095E-01	
AC-228		7.9671E-01	7.9671E-01	1.5268E-01	1.5977E-01	
TH-227	#A	-4.0915E-01	-4.0915E-01	3.9396E-01	3.9470E-01	4.249E-01

PA-234 #B	1.0902E-02	1.0902E-02	1.3096E-01	1.3096E-01	1.462E-01

TH-234 #B	8.5361E-01	8.5361E-01	8.0239E-01	8.0378E-01	1.792E+00
AM-241 #A	-4.9937E-02	-4.9938E-02	1.9834E-01	1.9836E-01	2.117E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (1120.2 to 2000.1 keV) 2.0793205E+01 pCi/gm
Total Decayed Activity (1120.2 to 2000.1 keV) 2.0794195E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
DAT

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 107F_27JUL2006_1434.An1

Sample description
FSS-OOL-05-06-019-F

Spectrum Filename: C:\GammaVision\Spectra\107F_27JUL2006_1434.An1

Acquisition information
Start time: 27-Jul-2006 14:35:03
Live time: 2000
Real time: 2002
Dead time: 0.10 %
Detector ID: 2

Detector system
Det 107- DSPE- 634

Calibration
Filename: D7_1LSa.Clb
Detector 107 Calibration for 1 Liter Sand Marinelli

Energy Calibration
Created: 29-Oct-2004 06:48:53
Zero offset: 0.157 keV
Gain: 0.500 keV/channel
Quadratic: -1.676E-08 keV/channel^2

Efficiency Calibration
Created: 29-Oct-2004 06:51:32
Type: Polynomial
Uncertainty: 1.174 %
Coefficients: -0.279532 -4.778179 0.614896
-0.087174 0.005356 -0.000131

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.16keV)
Stop channel: 4000 (2000.15keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 1.7630E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.7630E+03) =
5.6721E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	24-Jul-2006 20:45:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	107_150K_28APR05.Pbc 01-May-2005 05:30:33
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 19 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.2136

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
74.79	324.	12.19	1.18	2.849E-02				
74.79	324.	12.19	1.18	2.849E-02	74.81	9.600	8.966E-01	PB212
77.11	491.	8.51	1.18	2.958E-02	77.11	17.500	7.279E-01	PB212
					77.11	10.700	1.179E+00	PB214
84.51	79.	41.29	1.18	3.237E-02				
87.42	173.	20.03	1.19	3.319E-02	86.45	32.740	1.235E-01	EU155
89.41	126.	27.28	1.19	3.369E-02	88.04	3.790	PBC<MDA	CD109
93.05	216.	15.88	1.19	3.450E-02	92.38	2.570	1.808E+00	TH234
					92.80	3.000	1.457E+00	TH234
128.89	83.	39.83	1.51	3.818E-02				
185.96	192.	20.87	1.35	3.610E-02	185.99	3.280	1.246E+00	RA226
209.59	108.	24.64	1.11	3.426E-02				
238.80	1233.	3.33	1.30	3.188E-02	238.63	43.100	6.785E-01	PB212
241.72	187.	15.23	1.30	3.165E-02	241.00	3.900	1.143E+00	RA224
					241.92	7.470	6.005E-01	PB214
270.51	80.	32.09	1.01	2.942E-02				
277.70	81.	30.81	0.68	2.890E-02				
295.48	282.	8.45	1.34	2.766E-02	295.22	19.200	3.999E-01	PB214
300.38	87.	22.59	1.34	2.733E-02				
328.46	74.	35.78	1.49	2.558E-02				
338.23	251.	13.33	1.59	2.501E-02	338.40	12.010	6.317E-01	AC228
352.17	447.	6.89	1.35	2.425E-02	351.99	37.100	3.761E-01	PB214
462.94	114.	19.93	1.37	1.955E-02				
462.94	114.	19.93	1.37	1.955E-02	463.51	10.000	4.373E-01	SB125
510.86	189.	15.13	1.67	1.808E-02	510.72	22.500	2.929E-01	TL208
583.39	418.	7.07	1.52	1.628E-02	583.14	86.000	2.262E-01	TL208
609.57	388.	7.20	1.52	1.574E-02	609.32	46.090	4.051E-01	BI214

727.64	106.	21.11	1.79	1.374E-02	727.17	11.800	4.940E-01	BI212
772.37	55.	34.74	1.52	1.313E-02				
795.43	45.	28.34	1.29	1.284E-02				
795.43	45.	28.34	1.29	1.284E-02	795.76	85.400	3.117E-02	CS134
860.52	93.	21.89	1.36	1.211E-02				
911.51	292.	9.85	1.40	1.160E-02	911.07	29.000	6.552E-01	AC228
968.31	242.	12.75	1.77	1.110E-02	968.90	17.460	9.497E-01	AC228
1119.68	92.	21.15	0.91	9.970E-03	1120.28	15.040	4.724E-01	BI214
1377.56	48.	26.50	0.67	8.559E-03				
1461.21	1779.	2.45	2.17	8.189E-03	1460.75	10.700	1.552E+01	K40
1621.15	11.	41.65	2.00	7.569E-03	1620.56	2.750	PBC<MDA	BI212
1765.24	75.	11.55	1.97	7.081E-03	1764.51	15.920	5.037E-01	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
149.25	74.80	617.	324.	0.162	36.57	1.178	BI-207	D
153.89	77.12	630.	491.	0.246	25.54	1.179	PB-214	D
168.69	84.83	495.	79.	0.040	123.86	1.185	BI-207	lD
178.49	89.73	529.	126.	0.063	81.84	1.188	PB-214	lD
257.43	128.89	488.	100.	0.050	98.47	1.510	AC-228	s
418.83	209.59	300.	108.	0.054	73.91	1.107	NP-239	
477.23	238.79	224.	1233.	0.616	9.98	1.297	PB-212	D
483.07	241.70	310.	187.	0.093	45.69	1.299	PB-214	D
540.64	270.51	260.	80.	0.040	96.27	1.010	AC-228	
600.36	300.37	260.	68.	0.034	116.79	1.235	PB-212	
656.53	328.46	238.	74.	0.037	107.34	1.494	RH-106M	
1544.30	772.37	101.	55.	0.028	87.15	1.521	J-132	sM
1720.60	860.52	88.	93.	0.046	53.18	1.356	TL-208	
2754.71	1377.56	28.	48.	0.024	79.50	0.666	BI-214	s

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.
M - Peak is close to a library peak.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-212	149.29	74.81	1583.	255.	0.128	67.73	1.500D
PB-212	153.89	77.11	1377.	400.	0.200	42.16	1.500D
PB-214	153.89	77.11	1382.	395.	0.197	42.16	1.500D
EU-155	174.01	87.17	1245.	146.	0.073	105.79	1.500
TH-234	185.85	93.09	1154.	191.	0.095	70.96	1.500s
RA-226	371.55	185.96	568.	192.	0.096	62.60	1.353
PB-212	477.21	238.79	693.	945.	0.472	15.03	1.500s
RA-224	483.01	241.69	803.	121.	0.060	101.34	1.500
PB-214	590.52	295.45	317.	260.	0.130	33.80	1.500
AC-228	676.07	338.23	283.	247.	0.124	39.99	1.589
PB-214	703.92	352.15	171.	448.	0.224	18.53	1.500
SB-125	925.91	463.16	124.	92.	0.046	58.01	1.500
TL-208	1021.30	510.86	225.	155.	0.078	45.40	1.674s
TL-208	1166.37	583.39	135.	413.	0.207	21.21	1.524
BI-214	1218.72	609.57	120.	383.	0.192	21.60	1.516

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
BI-212	1454.85	727.64	110.	105.	0.052	63.34	1.785
CS-134	1590.18	795.30	61.	43.	0.021	88.91	1.684
AC-228	1822.59	911.51	123.	288.	0.144	29.55	1.401
AC-228	1936.17	968.31	157.	240.	0.120	38.26	1.767s
BI-214	2238.93	1119.68	91.	92.	0.046	63.44	0.909s
K-40	2922.01	1461.21	36.	1774.	0.887	7.34	2.172
BI-214	3530.13	1765.24	1.	74.	0.037	34.64	1.966

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	Peak MDA Value pCi/gm	COMMENTS
BE-7		2.2904E-02					
			477.56	2.290E-02	%(	2.295E-01 6.70E-02 G	
K-40		1.5519E+01					
			1460.75	1.552E+01	(P	2.666E-01 3.81E-01 G	
MN-54		1.6068E-02					
			834.81	1.607E-02	%(P	2.595E-02 8.00E-03 G	
CO-57		7.5755E-03					
			122.07	7.575E-03	%(P	3.209E-02 9.63E-03 G K	
			136.43	6.098E-02	& P	2.660E-01 7.99E-02 G	
CO-60		-1.1209E-02					
			1332.51	-1.121E-02	%(P	3.440E-02 9.78E-03 G K	
			1173.23	1.990E-03	& P	4.863E-02 1.41E-02 G K	
Sr-85		-8.4896E-03					
			514.00	-8.490E-03	%(	3.117E-02 9.30E-03 G	
Kr-85		-2.1991E+02					
			513.99	-2.199E+02	%(P	7.035E+02 2.08E+02 G	
Y-88		-1.9722E-03					
			1836.01	-1.972E-03	%(P	2.326E-02 6.04E-03 G K	
			898.02	6.221E-03	& P	2.969E-02 8.64E-03 G	
NB-94		-4.0331E-03					
			871.10	-4.033E-03	&(P	2.583E-02 7.48E-03 G K	
			702.50	9.920E-03	% P	2.381E-02 7.15E-03 G K	

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
Ag-108M	3.6153E-03						
		722.95	3.615E-03	%(	3.110E-02	9.06E-03	G K
		614.37	-7.255E-03	%	3.035E-02	8.99E-03	G
		433.93	-7.062E-03	% P	2.592E-02	7.66E-03	G
CD-109	3.6291E-01						
		88.04	3.629E-01	%(P	1.012E+00	3.06E-01	G
SN-113	7.7513E-03						
		391.71	7.751E-03	&(P	3.447E-02	1.02E-02	G K
		255.04	3.505E-01	%	1.189E+00	3.57E-01	G
SB-125	1.0718E-01						
		427.95	2.096E-02	&(P	6.502E-02	1.93E-02	G K
		600.77	-4.428E-02	% P	1.366E-01	4.04E-02	G
		636.15	4.349E-02	& P	1.984E-01	5.81E-02	G
		463.51	3.624E-01	(P	2.147E-01	7.22E-02	G
		176.29	-7.280E-03	& P	4.138E-01	1.23E-01	G
I-131	-7.4767E-03						
		364.48	-7.477E-03	&(	3.710E-02	1.10E-02	G K
		636.97	-1.054E-03	&	3.349E-01	9.45E-02	G
		284.29	6.014E-03	&	5.020E-01	1.48E-01	G
CS-134	1.8834E-02						
		604.66	9.146E-03	%(P	2.032E-02	6.13E-03	G K
		795.76	2.991E-02	(P	2.738E-02	8.97E-03	G
		569.29	4.339E-03	&	1.507E-01	4.34E-02	G
		801.84	-1.843E-03	% P	4.143E-01	1.20E-01	G
CS-137	2.9976E-03						
		661.62	2.998E-03	&(P	3.592E-02	1.04E-02	G
CE-139	6.7138E-03						
		165.85	6.714E-03	&(P	3.385E-02	1.01E-02	G
EU-152	-9.5554E-05						
		121.78	-9.555E-05	%(P	9.850E-02	2.93E-02	G K
		344.30	-4.573E-03	% P	8.992E-02	2.64E-02	G
		1408.08	-7.494E-04	% P	1.205E-01	3.28E-02	G
		964.00	-2.081E-02	& P	3.411E-01	1.00E-01	G
		1112.07	-2.887E-03	% P	2.979E-01	8.56E-02	G
		778.90	-5.553E-04	& P	2.046E-01	5.83E-02	G
EU-154	-2.6985E-04						
		123.10	-2.698E-04	%(P	7.089E-02	2.11E-02	G K
		1274.80	-7.983E-04	% P	1.294E-01	3.73E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
		723.30	-7.913E-03	% P	1.213E-01	3.47E-02	G
		1004.80	-1.996E-02	& P	1.427E-01	4.09E-02	G
EU-155	1.0391E-01						
		86.45	1.039E-01	(	1.193E-01	3.66E-02	G K
		105.31	1.112E-02	% P	1.416E-01	4.23E-02	G
HG-203	-8.3209E-03						
		279.17	-8.321E-03	%(P	3.341E-02	9.98E-03	G K
		72.87	-3.852E-01	& P	9.055E-01	2.74E-01	G
		70.83	3.496E-01	%	1.295E+00	3.90E-01	G
		82.50	-5.994E-01	&	1.890E+00	5.70E-01	G
TL-208	2.2622E-01						
		583.14	2.262E-01	(P	3.106E-02	1.62E-02	G
		510.72	2.929E-01	+ P	1.367E-01	5.39E-02	G
PB-212	5.4564E-01						
		238.63	5.269E-01	@(P	6.993E-02	2.68E-02	G K
							Energy duplication
		77.11	5.918E-01	@(	2.601E-01	8.32E-02	G
							Energy duplication
		74.81	7.147E-01	& P	5.271E-01	1.64E-01	G
PB-214	3.7965E-01						
		351.99	3.819E-01	(P	5.418E-02	2.39E-02	G K
		295.22	3.754E-01	(P	1.236E-01	4.30E-02	G
							Energy duplication
		77.11	9.565E-01	+ P	4.261E-01	1.36E-01	G
		241.92	2.690E-01	% P	4.529E-01	1.38E-01	G
BI-212	4.9400E-01						
		727.17	4.940E-01	(P	2.443E-01	1.06E-01	G K
		1620.56	3.939E-01	% P	4.949E-01	1.72E-01	G
		785.42	3.652E-01	% P	1.441E+00	4.25E-01	G
BI-214	4.2168E-01						
		609.32	4.051E-01	(P	5.669E-02	2.95E-02	G K
		1764.51	5.037E-01	+ P	5.009E-02	5.89E-02	G
		1120.28	4.724E-01	(P	2.406E-01	1.01E-01	G
RA-224	7.4809E-01						
		241.00	7.481E-01	(P	8.352E-01	2.57E-01	G
RA-226	1.2461E+00						
		185.99	1.246E+00	(	7.368E-01	2.60E-01	G
AC-228	6.4835E-01						
		911.07	6.552E-01	(P	1.240E-01	6.55E-02	G K
		968.90	9.497E-01	+ P	2.419E-01	1.22E-01	G
		338.40	6.317E-01	(P	2.069E-01	8.53E-02	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments

TH-227      -1.5785E-01
                          236.00-1.578E-01 %(P 3.201E-01 9.71E-02 G K
                          256.25 9.007E-02 % P 3.653E-01 1.09E-01 G

PA-234      -8.7672E-04
                           98.44-8.767E-04 %(  1.183E-01 3.52E-02 G K
                          946.00 0.000E+00 %   1.582E-01 4.52E-02 G
                          131.28-1.988E-02 &   1.492E-01 4.47E-02 G
                           94.67 8.206E-03 %   2.089E-01 6.23E-02 G
                          883.24 4.233E-02 %   1.978E-01 5.76E-02 G
                          926.70 4.424E-02 %   2.354E-01 6.84E-02 G
                          569.26-7.489E-02 &   2.590E-01 7.71E-02 G

TH-234       8.2111E-01
                           63.29 3.622E-01 %(P 1.586E+00 4.75E-01 G K
                           92.80 1.418E+00  (P 1.197E+00 3.70E-01 G
                           92.38 1.158E-01 % P 1.411E+00 4.22E-01 G

AM-241       1.0146E-02
                           59.54 1.015E-02 &(P 2.122E-01 6.34E-02 G
   ( - This peak used in the nuclide activity average.

   * - Peak is too wide, but only one peak in library.
   ! - Peak is part of a multiplet and this area went
       negative during deconvolution.
   ? - Peak is too narrow.
   @ - Peak is too wide at FW25M, but ok at FWHM.
   % - Peak fails sensitivity test.
   $ - Peak identified, but first peak of this nuclide
       failed one or more qualification tests.
   + - Peak activity higher than counting uncertainty range.
   - - Peak activity lower than counting uncertainty range.
   = - Peak outside analysis energy range.
   & - Calculated peak centroid is not close enough to the
       library energy centroid for positive identification.
   P - Peakbackground subtraction
   } - Peak is too close to another for the activity
       to be found directly.

   Nuclide Codes:                      Peak Codes:
   T - Thermal Neutron Activation      G - Gamma Ray
   F - Fast Neutron Activation         X - X-Ray
   I - Fission Product                 P - Positron Decay
   N - Naturally Occurring Isotope     S - Single-Escape
   P - Photon Reaction                 D - Double-Escape
   C - Charged Particle Reaction       K - Key Line
   M - No MDA Calculation              A - Not in Average
```

R - Coincidence Corrected C - Coincidence Peak
H - Halflife limit exceeded

- -

***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	2.2103E-02	2.2904E-02	2.0109E-01	2.0110E-01	2.215E-01
K-40		1.5519E+01	1.5519E+01	1.1425E+00	1.4647E+00	
MN-54	#A	1.5970E-02	1.6068E-02	2.4011E-02	2.4030E-02	2.579E-02
CO-57	#B	7.5223E-03	7.5755E-03	2.8905E-02	2.8908E-02	3.186E-02
CO-60	#B	-1.1198E-02	-1.1209E-02	5.3730E-02	5.3734E-02	3.437E-02
Sr-85	#A	-8.2442E-03	-8.4896E-03	2.7901E-02	2.7905E-02	3.027E-02
Kr-85	#A	-2.1990E+02	-2.1991E+02	8.2038E+02	8.2049E+02	7.035E+02
Y-88	#B	-1.9374E-03	-1.9722E-03	5.0491E-02	5.0492E-02	2.284E-02
NB-94	#B	-4.0331E-03	-4.0331E-03	2.3419E-02	2.3420E-02	2.583E-02
Ag-108M	#B	3.6152E-03	3.6153E-03	2.7168E-02	2.7169E-02	3.110E-02
CD-109	#A	3.6139E-01	3.6291E-01	9.1722E-01	9.1744E-01	1.008E+00
SN-113	#B	7.6243E-03	7.7513E-03	3.0586E-02	3.0589E-02	3.390E-02
SB-125	#F	1.0698E-01	1.0718E-01	6.4073E-02	6.4385E-02	6.490E-02
I-131	#B	-5.9021E-03	-7.4767E-03	3.3051E-02	3.3054E-02	2.929E-02
CS-134	#B	1.8786E-02	1.8834E-02	1.6953E-02	1.6990E-02	2.026E-02
CS-137	#A	2.9971E-03	2.9976E-03	3.1265E-02	3.1266E-02	3.592E-02
CE-139	#A	6.6216E-03	6.7138E-03	3.0430E-02	3.0433E-02	3.338E-02
EU-152	#B	-9.5515E-05	-9.5554E-05	2.4298E-02	2.4298E-02	9.846E-02
EU-154	#B	-2.6968E-04	-2.6985E-04	6.8412E-02	6.8412E-02	7.085E-02
EU-155	#A	1.0380E-01	1.0391E-01	1.0992E-01	1.1008E-01	1.192E-01
HG-203	#B	-7.9881E-03	-8.3209E-03	3.3285E-02	3.3289E-02	3.207E-02
TL-208		2.2622E-01	2.2622E-01	4.8498E-02	5.0305E-02	
PB-212	#	5.4564E-01	5.4564E-01	8.3363E-02	8.9375E-02	6.993E-02
PB-214	#	3.7965E-01	3.7965E-01	7.1169E-02	7.4618E-02	5.418E-02
BI-212		4.9400E-01	4.9400E-01	3.1674E-01	3.1808E-01	
BI-214		4.2168E-01	4.2168E-01	9.2102E-02	9.5410E-02	
RA-224	#A	7.4809E-01	7.4809E-01	7.7211E-01	7.7337E-01	8.352E-01
RA-226		1.2461E+00	1.2461E+00	7.8011E-01	7.8357E-01	
AC-228		6.4835E-01	6.4835E-01	1.6338E-01	1.6781E-01	
TH-227	#B	-1.5785E-01	-1.5785E-01	2.9355E-01	2.9370E-01	3.201E-01
PA-234	#B	-8.7672E-04	-8.7672E-04	1.0558E-01	1.0558E-01	1.183E-01
TH-234	#B	8.2111E-01	8.2111E-01	6.4292E-01	6.4453E-01	1.586E+00
AM-241	#A	1.0146E-02	1.0146E-02	1.9019E-01	1.9019E-01	2.122E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.

H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (270.2 to 2000.1 keV) 1.8555418E+01 pCi/gm
Total Decayed Activity (270.2 to 2000.1 keV) 1.8555422E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
DAT

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 101F_5SEPT2006_1112.An1

Sample description
FSS-OOL-05-07-016-F-B

Spectrum Filename: C:\GammaVision\Spectra\101F_5SEPT2006_1112.An1

Acquisition information
Start time: 05-Sep-2006 11:12:37
Live time: 2000
Real time: 2002
Dead time: 0.10 %
Detector ID: 1

Detector system
Det 101- DSPE-633

Calibration
Filename: D1_1LSa.Clb
Detector 101 1.0 Liter Marinelli Sand

Energy Calibration
Created: 03-Sep-2004 08:50:48
Zero offset: 0.244 keV
Gain: 0.500 keV/channel
Quadratic: -2.493E-08 keV/channel^2

Efficiency Calibration
Created: 03-Sep-2004 08:52:26
Type: Polynomial
Uncertainty: 0.626 %
Coefficients: -0.321775 -5.816463 0.734234
-0.099357 0.006049 -0.000149

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.23keV)
Stop channel: 4000 (1999.11keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 1.3530E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.3530E+03) =
7.3910E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	31-Aug-2006 15:49:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	101_150K_28APR05.Pbc 01-May-2005 05:24:47
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 14 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.1650

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
74.41	119.	22.19	1.00	1.654E-02	74.81	9.600	PBC<MDA	PB212
77.27	261.	10.17	1.01	1.736E-02	77.11	10.700	1.397E+00	PB214
					77.11	17.500	8.667E-01	PB212
87.29	99.	23.81	1.01	1.926E-02	86.45	32.740	1.586E-01	EU155
93.04	97.	22.48	1.02	1.995E-02	92.80	3.000	PBC<MDA	TH234
185.94	73.	33.21	1.25	1.859E-02				
185.94	73.	33.21	1.25	1.859E-02	185.99	3.280	1.196E+00	RA226
238.71	511.	5.24	1.12	1.557E-02	238.63	43.100	7.506E-01	PB212
241.70	91.	21.20	1.12	1.541E-02	241.00	3.900	1.491E+00	RA224
					241.92	7.470	PBC<MDA	PB214
295.25	155.	13.15	1.19	1.292E-02	295.22	19.200	6.165E-01	PB214
338.46	90.	21.83	0.92	1.135E-02	338.40	12.010	6.464E-01	AC228
351.90	251.	10.66	1.04	1.093E-02				
351.90	251.	10.66	1.04	1.093E-02	351.99	37.100	6.129E-01	PB214
462.85	33.	31.24	1.50	8.342E-03	463.51	10.000	3.914E-01	SB125
511.19	119.	15.27	1.30	7.584E-03	510.72	22.500	6.022E-01	TL208
582.96	143.	11.12	1.33	6.686E-03	583.14	86.000	2.447E-01	TL208
609.09	194.	9.39	1.36	6.415E-03	609.32	46.090	6.505E-01	BI214
661.62	166.	11.29	1.57	5.937E-03	661.62	84.620	3.273E-01	CS137
727.19	25.	37.05	1.50	5.443E-03	727.17	11.800	PBC<MDA	BI212
794.71	34.	34.12	1.39	5.022E-03				
794.71	34.	34.12	1.39	5.022E-03	795.76	85.400	7.818E-02	CS134
910.94	80.	13.82	1.05	4.447E-03	911.07	29.000	6.036E-01	AC228
968.20	81.	19.95	1.41	4.215E-03	968.90	17.460	1.085E+00	AC228
1119.80	49.	31.75	1.40	3.712E-03	1120.28	15.040	8.772E-01	BI214
1460.42	504.	4.53	1.77	2.943E-03	1460.75	10.700	1.590E+01	K40

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
148.39	74.82	291.	119.	0.060	66.56	1.005	PB-214	D
154.11	77.69	222.	261.	0.131	30.51	1.007	PB-214	D
174.15	87.56	229.	99.	0.050	71.44	1.014	PB-214	lD
477.11	238.69	103.	511.	0.255	15.73	1.122	PB-212	D
483.09	241.68	139.	91.	0.045	63.61	1.124	PB-214	D
1589.64	794.71	34.	34.	0.017	102.35	1.390	AC-228	l

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-212	149.25	74.84	707.	129.	0.064	87.83	1.499s
PB-214	153.79	77.11	633.	214.	0.107	53.05	1.499D
PB-212	153.79	77.11	630.	217.	0.109	53.05	1.499D
TH-234	185.68	93.05	524.	94.	0.047	100.65	1.499
RA-226	371.63	185.99	321.	75.	0.037	107.56	1.499s
PB-212	477.10	238.70	293.	388.	0.194	23.67	1.499
RA-224	483.20	241.75	335.	80.	0.040	101.98	1.499
PB-214	590.46	295.36	149.	148.	0.074	42.09	1.499s
AC-228	676.71	338.46	127.	88.	0.044	65.49	0.925
PB-214	703.65	351.93	96.	214.	0.107	27.90	1.499
SB-125	925.59	462.85	41.	33.	0.016	93.72	1.499s
TL-208	1022.32	511.19	82.	103.	0.051	45.81	1.296s
TL-208	1165.93	582.96	43.	141.	0.070	33.35	1.332
BI-214	1218.21	609.09	43.	192.	0.096	28.16	1.362s
CS-137	1323.34	661.62	53.	165.	0.082	33.88	1.571
BI-212	1454.54	727.19	32.	25.	0.012	111.14	1.499s
AC-228	1822.24	910.94	20.	78.	0.039	41.47	1.053s
AC-228	1936.81	968.20	44.	80.	0.040	59.85	1.415
BI-214	2240.19	1119.80	55.	49.	0.025	95.24	1.401
K-40	2921.85	1460.42	6.	501.	0.251	13.58	1.766

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	MDA Value pCi/gm	COMMENTS
BE-7		3.8714E-02					
			477.56	3.871E-02	%(	4.845E-01 1.38E-01	G
K-40		1.5900E+01					
			1460.75	1.590E+01	(P	4.414E-01 7.23E-01	G
MN-54		2.0087E-02					
			834.81	2.009E-02	%(P	5.539E-02 1.64E-02	G
CO-57		-1.5289E-02					
			122.07	-1.529E-02	%(	5.987E-02 1.80E-02	G K
			136.43	-6.675E-02	%	4.762E-01 1.42E-01	G
CO-60		2.8599E-02					
			1332.51	2.860E-02	%(P	8.413E-02 2.48E-02	G K
			1173.23	1.680E-02	& P	8.768E-02 2.52E-02	G K
Sr-85		-1.5232E-02					
			514.00	-1.523E-02	%(	7.665E-02 2.26E-02	G
Kr-85		-3.7025E+02					
			513.99	-3.703E+02	%(P	1.689E+03 4.95E+02	G
Y-88		1.1466E-02					
			1836.01	1.147E-02	%(	5.137E-02 1.39E-02	G K
			898.02	-5.818E-03	% P	7.009E-02 1.96E-02	G
NB-94		1.0070E-02					
			871.10	1.007E-02	&(P	5.125E-02 1.45E-02	G K
			702.50	1.035E-02	% P	5.722E-02 1.65E-02	G K
Ag-108M		-1.3097E-03					
			722.95	-1.310E-03	&(	6.506E-02 1.82E-02	G K
			614.37	-9.613E-03	% P	6.200E-02 1.78E-02	G
			433.93	-8.232E-03	%	5.232E-02 1.52E-02	G
CD-109		3.3294E-01					
			88.04	3.329E-01	%(P	1.647E+00 4.93E-01	G
SN-113		-4.5200E-03					
			391.71	-4.520E-03	&(	8.899E-02 2.58E-02	G K
			255.04	-1.167E-01	% P	2.278E+00 6.66E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	6.6003E-02						
		427.95	-4.394E-02	&(P	1.881E-01	5.54E-02	G K
		600.77	-4.009E-03	& P	2.450E-01	6.74E-02	G
		636.15	2.024E-02	% P	4.484E-01	1.25E-01	G
		463.51	3.914E-01	*(P	3.908E-01	1.28E-01	G
		176.29	1.829E-01	% P	7.159E-01	2.14E-01	G
I-131	-5.5820E-03						
		364.48	-5.582E-03	&(	9.391E-02	2.72E-02	G K
		636.97	1.050E-03	%	1.084E+00	3.01E-01	G
		284.29	-1.889E-01	&	1.109E+00	3.27E-01	G
CS-134	-9.8395E-04						
		604.66	-9.839E-04	%(P	1.468E-01	4.32E-02	G K
		795.76	4.180E-02	% P	6.094E-02	1.92E-02	G
		569.29	1.399E-01	% P	2.762E-01	8.41E-02	G
		801.84	-9.586E-02	&	7.167E-01	2.04E-01	G
CS-137	3.2734E-01						
		661.62	3.273E-01	(P	7.309E-02	3.72E-02	G
CE-139	1.1689E-03						
		165.85	1.169E-03	%(P	6.132E-02	1.81E-02	G
EU-152	-5.3852E-02						
		121.78	-5.385E-02	%(P	1.744E-01	5.24E-02	G K
		344.30	4.844E-02	% P	1.800E-01	5.33E-02	G
		1408.08	-3.809E-02	% P	2.651E-01	7.10E-02	G
		964.00	-1.590E-01	& P	7.005E-01	2.05E-01	G
		1112.07	8.590E-02	& P	5.766E-01	1.64E-01	G
		778.90	-7.972E-02	% P	4.693E-01	1.34E-01	G
EU-154	-2.9845E-02						
		123.10	-2.984E-02	&(P	1.174E-01	3.51E-02	G K
		1274.80	-1.294E-02	& P	2.431E-01	6.76E-02	G
		723.30	-1.167E-01	& P	3.575E-01	1.06E-01	G
		1004.80	-6.936E-02	% P	4.440E-01	1.27E-01	G
EU-155	-2.2148E-02						
		86.45	-2.215E-02	%(	2.070E-01	6.18E-02	G K
		105.31	5.703E-02	%	2.240E-01	6.71E-02	G
HG-203	6.0329E-04						
		279.17	6.033E-04	&(	6.481E-02	1.89E-02	G K
		72.87	-4.239E-01	% P	1.339E+00	4.02E-01	G
		70.83	-4.291E-02	&	3.055E+00	9.11E-01	G
		82.50	1.897E-02	&	2.814E+00	8.33E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	2.4467E-01						
		583.14	2.447E-01	(P	5.791E-02	2.76E-02	G
		510.72	6.022E-01	+ P	2.627E-01	1.06E-01	G
PB-212	5.7739E-01						
		238.63	5.774E-01	(P	1.227E-01	4.63E-02	G K
							Energy duplication
		77.11	7.210E-01	+	3.969E-01	1.27E-01	G
		74.81	8.094E-01	& P	7.964E-01	2.47E-01	G
PB-214	5.5141E-01						
		351.99	5.276E-01	(P	1.191E-01	4.95E-02	G K
		295.22	5.974E-01	@(P	2.396E-01	8.48E-02	G
							Energy duplication
		77.11	1.159E+00	+ P	6.511E-01	2.09E-01	G
		241.92	4.211E-01	% P	8.195E-01	2.49E-01	G
BI-212	3.8491E-01						
		727.17	3.849E-01	(P	4.543E-01	1.47E-01	G K
		1620.56	1.967E-01	%	1.944E+00	5.06E-01	G
		785.42	6.989E-02	& P	2.654E+00	7.28E-01	G
BI-214	6.5048E-01						
		609.32	6.505E-01	@(P	1.118E-01	6.14E-02	G K
		1764.51	1.588E-01	% P	4.467E-01	1.30E-01	G
		1120.28	8.772E-01	+ P	6.669E-01	2.81E-01	G
RA-224	1.3237E+00						
		241.00	1.324E+00	(P	1.460E+00	4.54E-01	G
RA-226	1.2232E+00						
		185.99	1.223E+00	*(	1.412E+00	4.39E-01	G
AC-228	6.1615E-01						
		911.07	6.036E-01	(P	1.827E-01	8.54E-02	G K
		968.90	1.085E+00	+ P	4.572E-01	2.18E-01	G
		338.40	6.464E-01	(P	4.043E-01	1.45E-01	G
TH-227	-1.4195E-01						
		236.00	-1.420E-01	%(P	5.497E-01	1.64E-01	G K
		256.25	-8.783E-03	& P	5.922E-01	1.71E-01	G
PA-234	1.5185E-02						
		98.44	1.519E-02	%(	1.702E-01	5.03E-02	G K
		946.00	1.100E-03	&	3.429E-01	9.46E-02	G
		131.28	-3.923E-03	&	2.552E-01	7.56E-02	G
		94.67	-1.125E-01	%	3.750E-01	1.13E-01	G
		883.24	1.240E-01	%	3.975E-01	1.16E-01	G
		926.70	-6.095E-02	%	5.976E-01	1.68E-01	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26 2.129E-01 %   4.054E-01 1.24E-01 G

TH-234       1.0431E+00
                           63.29 6.317E-01 &(P 2.446E+00 7.30E-01 G K
                           92.80 1.578E+00  (P 1.831E+00 5.64E-01 G
                           92.38 2.370E-01 % P 1.962E+00 5.80E-01 G

AM-241      -3.2715E-02
                           59.54-3.272E-02 %(P 2.679E-01 7.91E-02 G
   ( - This peak used in the nuclide activity average.

   * - Peak is too wide, but only one peak in library.
   ! - Peak is part of a multiplet and this area went
       negative during deconvolution.
   ? - Peak is too narrow.
   @ - Peak is too wide at FW25M, but ok at FWHM.
   % - Peak fails sensitivity test.
   $ - Peak identified, but first peak of this nuclide
       failed one or more qualification tests.
   + - Peak activity higher than counting uncertainty range.
   - - Peak activity lower than counting uncertainty range.
   = - Peak outside analysis energy range.
   & - Calculated peak centroid is not close enough to the
       library energy centroid for positive identification.
   P - Peakbackground subtraction
   } - Peak is too close to another for the activity
       to be found directly.

   Nuclide Codes:                      Peak Codes:
   T - Thermal Neutron Activation      G - Gamma Ray
   F - Fast Neutron Activation         X - X-Ray
   I - Fission Product                 P - Positron Decay
   N - Naturally Occurring Isotope     S - Single-Escape
   P - Photon Reaction                 D - Double-Escape
   C - Charged Particle Reaction       K - Key Line
   M - No MDA Calculation              A - Not in Average
   R - Coincidence Corrected           C - Coincidence Peak
   H - Halflife limit exceeded

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
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***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	3.6372E-02	3.8714E-02	4.1504E-01	4.1504E-01	4.552E-01
K-40		1.5900E+01	1.5900E+01	2.1686E+00	2.3474E+00	
MN-54	#A	1.9874E-02	2.0087E-02	4.9094E-02	4.9107E-02	5.480E-02
CO-57	#B	-1.5101E-02	-1.5289E-02	5.3851E-02	5.3858E-02	5.914E-02
CO-60	#B	2.8549E-02	2.8599E-02	7.4433E-02	7.4451E-02	8.398E-02

Sr-85	#A	-1.4469E-02	-1.5232E-02	6.7760E-02	6.7766E-02	7.281E-02
Kr-85	#A	-3.7024E+02	-3.7025E+02	1.8083E+03	1.8084E+03	1.689E+03
Y-88	#B	1.1113E-02	1.1466E-02	4.1815E-02	4.1820E-02	4.979E-02
NB-94	#B	1.0070E-02	1.0070E-02	4.3572E-02	4.3576E-02	5.125E-02
Ag-108M	#B	-1.3096E-03	-1.3097E-03	5.4473E-02	5.4474E-02	6.505E-02
CD-109	#A	3.3050E-01	3.3294E-01	1.4797E+00	1.4798E+00	1.635E+00
SN-113	#B	-4.3910E-03	-4.5200E-03	7.7432E-02	7.7432E-02	8.645E-02
SB-125	#B	6.5786E-02	6.6003E-02	6.4606E-02	6.4714E-02	1.875E-01
I-131	#B	-3.6878E-03	-5.5820E-03	8.1699E-02	8.1700E-02	6.205E-02
CS-134	#B	-9.7961E-04	-9.8395E-04	1.6027E-01	1.6027E-01	1.461E-01
CS-137		3.2724E-01	3.2734E-01	1.1149E-01	1.1301E-01	
CE-139	#A	1.1409E-03	1.1689E-03	5.4277E-02	5.4277E-02	5.985E-02
EU-152	#B	-5.3814E-02	-5.3852E-02	1.6470E-01	1.6472E-01	1.743E-01
EU-154	#B	-2.9813E-02	-2.9845E-02	1.1312E-01	1.1314E-01	1.172E-01
EU-155	#B	-2.2108E-02	-2.2148E-02	1.8538E-01	1.8538E-01	2.066E-01
HG-203	#B	5.6165E-04	6.0329E-04	5.6668E-02	5.6668E-02	6.034E-02
TL-208		2.4467E-01	2.4467E-01	8.2965E-02	8.4109E-02	
PB-212	#	5.7739E-01	5.7739E-01	1.3883E-01	1.4261E-01	1.227E-01
PB-214	#	5.5141E-01	5.5141E-01	1.4077E-01	1.4418E-01	1.191E-01
BI-212	#A	3.8491E-01	3.8491E-01	4.3951E-01	4.4005E-01	4.543E-01
BI-214		6.5048E-01	6.5048E-01	1.8422E-01	1.8786E-01	
RA-224	#A	1.3237E+00	1.3237E+00	1.3620E+00	1.3640E+00	1.460E+00
RA-226	#A	1.2232E+00	1.2232E+00	1.3157E+00	1.3175E+00	1.412E+00
AC-228		6.1615E-01	6.1615E-01	2.4466E-01	2.4713E-01	
TH-227	#B	-1.4195E-01	-1.4195E-01	5.1099E-01	5.1106E-01	5.497E-01
PA-234	#B	1.5185E-02	1.5185E-02	1.5099E-01	1.5099E-01	1.702E-01
TH-234	#B	1.0431E+00	1.0431E+00	1.1188E+00	1.1203E+00	2.446E+00
AM-241	#A	-3.2715E-02	-3.2715E-02	2.8292E-01	2.8292E-01	2.679E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (295.1 to 1999.1 keV) 1.7738811E+01 pCi/gm
Total Decayed Activity (295.1 to 1999.1 keV) 1.7738911E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JPK

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 101F_5SEPT2006_1254.An1

Sample description
FSS-OOL-05-07-008-F

Spectrum Filename: C:\GammaVision\Spectra\101F_5SEPT2006_1254.An1

Acquisition information
Start time: 05-Sep-2006 12:55:19
Live time: 2000
Real time: 2002
Dead time: 0.09 %
Detector ID: 1

Detector system
Det 101- DSPE-633

Calibration
Filename: D1_1LSa.Clb
Detector 101 1.0 Liter Marinelli Sand

Energy Calibration
Created: 03-Sep-2004 08:50:48
Zero offset: 0.244 keV
Gain: 0.500 keV/channel
Quadratic: -2.493E-08 keV/channel^2

Efficiency Calibration
Created: 03-Sep-2004 08:52:26
Type: Polynomial
Uncertainty: 0.626 %
Coefficients: -0.321775 -5.816463 0.734234
-0.099357 0.006049 -0.000149

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.23keV)
Stop channel: 4000 (1999.11keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 1.3410E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.3410E+03) =
7.4571E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	31-Aug-2006 14:36:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	101_150K_28APR05.Pbc 01-May-2005 05:24:47
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 13 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.0331

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
74.69	121.	29.65	1.50	1.654E-02	74.81	9.600	7.648E-01	PB212
77.19	146.	25.22	1.50	1.720E-02	77.11	10.700	7.994E-01	PB214
					77.11	17.500	PBC<MDA	PB212
77.19	150.	25.22	1.50	1.720E-02	77.11	10.700	7.994E-01	PB214
					77.11	17.500	5.012E-01	PB212
87.28	80.	27.99	1.01	1.926E-02	86.45	32.740	1.293E-01	EU155
89.54	56.	37.75	1.02	1.956E-02	88.04	3.790	PBC<MDA	CD109
92.94	113.	20.68	1.02	1.994E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	1.808E+00	TH234
128.84	71.	31.02	1.03	2.110E-02				
186.09	75.	33.22	1.22	1.858E-02	185.99	3.280	1.242E+00	RA226
208.72	84.	31.06	1.12	1.725E-02				
238.74	440.	5.60	1.12	1.557E-02	238.63	43.100	6.511E-01	PB212
241.51	94.	19.10	1.12	1.542E-02	241.00	3.900	1.568E+00	RA224
295.32	155.	10.31	1.16	1.292E-02				
295.32	155.	10.31	1.16	1.292E-02	295.22	19.200	6.223E-01	PB214
327.40	41.	36.70	1.59	1.172E-02				
338.32	99.	17.51	1.04	1.135E-02	338.40	12.010	7.157E-01	AC228
352.02	221.	12.27	0.78	1.092E-02	351.99	37.100	5.446E-01	PB214
510.73	79.	16.82	1.17	7.590E-03	510.72	22.500	3.716E-01	TL208
583.08	108.	14.87	1.20	6.685E-03	583.14	86.000	1.846E-01	TL208
609.18	192.	10.52	1.25	6.414E-03	609.32	46.090	6.509E-01	BI214
661.71	134.	11.32	1.38	5.937E-03	661.62	84.620	2.667E-01	CS137
727.17	30.	29.93	1.50	5.443E-03	727.17	11.800	4.761E-01	BI212
911.32	81.	13.53	1.40	4.445E-03	911.07	29.000	6.161E-01	AC228
968.94	74.	17.90	0.75	4.212E-03	968.90	17.460	1.010E+00	AC228
1120.11	59.	26.69	1.48	3.711E-03	1120.28	15.040	1.058E+00	BI214

1460.68	337.	5.52	2.18	2.943E-03	1460.75	10.700	1.073E+01	K40
1764.21	20.	26.07	2.11	2.481E-03	1764.51	15.920	5.009E-01	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide
174.14	87.56	211.	80.	0.040	83.98	1.014	PB-214 lD
178.65	89.82	195.	56.	0.028	113.26	1.015	PB-214 lD
417.12	208.72	221.	84.	0.042	93.18	1.116	LU-177 s
477.17	238.69	84.	440.	0.220	16.81	1.122	PB-212 D
482.72	241.46	116.	94.	0.047	57.30	1.124	RA-224 D
654.57	327.40	79.	41.	0.020	110.09	1.587	AC-228 s

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-212	148.94	74.69	638.	121.	0.060	88.96	1.499
PB-214	153.79	77.11	642.	146.	0.073	75.65	1.499D
PB-212	153.79	77.11	638.	150.	0.075	75.65	1.499D
TH-234	185.34	92.88	519.	106.	0.053	86.61	1.499s
TH-234	185.33	92.87	486.	115.	0.057	81.61	1.499s
RA-226	371.87	186.11	290.	86.	0.043	90.02	1.499
PB-212	477.09	238.69	240.	338.	0.169	24.85	1.499
RA-224	483.28	241.79	237.	99.	0.050	71.86	1.499
PB-214	590.39	295.32	123.	129.	0.065	44.36	1.499
AC-228	676.42	338.32	86.	97.	0.048	52.54	1.038s
PB-214	703.86	352.03	103.	166.	0.083	34.42	1.499
TL-208	1021.39	510.73	55.	63.	0.031	50.45	1.166s
TL-208	1166.18	583.08	54.	105.	0.053	44.61	1.201
BI-214	1218.39	609.18	55.	191.	0.095	31.56	1.251s
CS-137	1323.52	661.71	35.	133.	0.066	33.97	1.381s
BI-212	1454.50	727.17	28.	30.	0.015	89.79	1.499s
AC-228	1822.98	911.32	15.	79.	0.039	40.60	1.396s
AC-228	1938.29	968.94	29.	74.	0.037	53.70	0.752s
BI-214	2240.81	1120.11	42.	59.	0.029	80.07	1.480s
K-40	2922.38	1460.68	5.	335.	0.168	16.56	2.180
BI-214	3529.86	1764.21	4.	20.	0.010	78.20	2.106s

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Code	MDA Value pCi/gm		COMMENTS
BE-7		2.8299E-02						
			477.56	2.830E-02	%(	4.163E-01	1.17E-01	G
K-40		1.0726E+01						
			1460.75	1.073E+01	(P	4.162E-01	5.96E-01	G
MN-54		2.5507E-02						
			834.81	2.551E-02	&(P	5.134E-02	1.56E-02	G
CO-57		-9.3794E-04						
			122.07	-9.379E-04	%(	5.169E-02	1.52E-02	G K
			136.43	1.420E-03	%	3.901E-01	1.15E-01	G
CO-60		1.2065E-02						
			1332.51	1.207E-02	&(P	5.327E-02	1.49E-02	G K
			1173.23	2.721E-02	% P	7.154E-02	2.12E-02	G K
Sr-85		-2.0264E-02						
			514.00	-2.026E-02	%(	6.971E-02	2.07E-02	G
Kr-85		-4.8073E+02						
			513.99	-4.807E+02	%(P	1.535E+03	4.53E+02	G
Y-88		-7.2658E-03						
			1836.01	-7.266E-03	%(	6.351E-02	1.67E-02	G K
			898.02	-1.053E-02	& P	7.166E-02	2.03E-02	G
NB-94		-7.6703E-03						
			871.10	-7.670E-03	%(P	5.191E-02	1.45E-02	G K
			702.50	-7.973E-05	& P	6.025E-02	1.68E-02	G K
Ag-108M		1.0751E-02						
			722.95	1.075E-02	&(	5.162E-02	1.48E-02	G K
			614.37	-1.931E-02	% P	7.207E-02	2.12E-02	G
			433.93	0.000E+00	&	5.856E-02	1.67E-02	G
CD-109		1.2405E-01						
			88.04	1.241E-01	%(P	1.657E+00	4.93E-01	G
SN-113		-1.0323E-02						
			391.71	-1.032E-02	&(	7.863E-02	2.29E-02	G K
			255.04	-3.084E-01	% P	2.181E+00	6.42E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	-1.6075E-02						
		427.95	-1.608E-02	%(P	1.428E-01	4.08E-02	G K
		600.77	8.926E-02	% P	1.993E-01	6.00E-02	G
		636.15	1.331E-02	& P	3.834E-01	1.05E-01	G
		463.51	3.156E-01	% P	4.561E-01	1.42E-01	G
		176.29	3.172E-02	& P	7.047E-01	2.07E-01	G
I-131	-1.5765E-02						
		364.48	-1.576E-02	%(	7.587E-02	2.22E-02	G K
		636.97	1.290E-01	&	9.436E-01	2.67E-01	G
		284.29	-6.634E-02	&	1.064E+00	3.09E-01	G
CS-134	-2.7433E-03						
		604.66	-2.743E-03	%(P	6.001E-02	1.69E-02	G K
		795.76	-2.507E-03	% P	5.613E-02	1.51E-02	G
		569.29	3.180E-02	% P	3.017E-01	8.52E-02	G
		801.84	-3.892E-02	%	6.257E-01	1.73E-01	G
CS-137	2.6667E-01						
		661.62	2.667E-01	*(P	6.082E-02	3.04E-02	G
CE-139	-5.2236E-03						
		165.85	-5.224E-03	%(P	5.563E-02	1.64E-02	G
EU-152	2.5540E-03						
		121.78	2.554E-03	%(P	1.448E-01	4.26E-02	G K
		344.30	4.460E-02	& P	1.521E-01	4.50E-02	G
		1408.08	3.787E-02	& P	2.655E-01	7.17E-02	G
		964.00	1.726E-01	% P	4.819E-01	1.43E-01	G
		1112.07	-5.772E-02	% P	5.723E-01	1.61E-01	G
		778.90	-4.183E-02	% P	4.037E-01	1.13E-01	G
EU-154	-6.5644E-04						
		123.10	-6.564E-04	%(P	1.056E-01	3.10E-02	G K
		1274.80	-1.536E-02	& P	2.182E-01	6.02E-02	G
		723.30	-1.578E-01	& P	3.996E-01	1.19E-01	G
		1004.80	1.431E-01	% P	3.204E-01	9.66E-02	G
EU-155	1.7190E-02						
		86.45	1.719E-02	&(	2.056E-01	6.13E-02	G K
		105.31	9.995E-02	%	2.060E-01	6.25E-02	G
HG-203	5.9972E-03						
		279.17	5.997E-03	&(	4.460E-02	1.30E-02	G K
		72.87	-3.131E-01	& P	1.311E+00	3.92E-01	G
		70.83	1.084E-01	%	1.966E+00	5.82E-01	G
		82.50	2.283E-02	%	2.841E+00	8.41E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	1.8463E-01						
		583.14	1.846E-01	(P	6.460E-02	2.81E-02	G
		510.72	3.716E-01	+ P	2.200E-01	7.84E-02	G
PB-212	5.0536E-01						
		238.63	5.070E-01	(P	1.124E-01	4.28E-02	G K
							Energy duplication
		77.11	5.012E-01	(	4.031E-01	1.26E-01	G
		74.81	7.648E-01	& P	7.640E-01	2.37E-01	G
PB-214	4.5003E-01						
		351.99	4.117E-01	(P	1.243E-01	4.78E-02	G K
		295.22	5.241E-01	(P	2.213E-01	7.86E-02	G
							Energy duplication
		77.11	7.994E-01	+ P	6.611E-01	2.07E-01	G
		241.92	3.355E-01	% P	8.108E-01	2.45E-01	G
BI-212	4.7609E-01						
		727.17	4.761E-01	*(P	4.313E-01	1.46E-01	G K
		1620.56	1.943E-02	%	2.177E+00	5.51E-01	G
		785.42	8.945E-01	% P	2.776E+00	8.16E-01	G
BI-214	6.5085E-01						
		609.32	6.509E-01	@(P	1.272E-01	6.89E-02	G K
		1764.51	5.009E-01	- P	3.096E-01	1.33E-01	G
		1120.28	1.058E+00	+ P	5.967E-01	2.84E-01	G
RA-224	1.6599E+00						
		241.00	1.660E+00	&(P	1.246E+00	4.00E-01	G
RA-226	1.4212E+00						
		185.99	1.421E+00	(	1.356E+00	4.26E-01	G
AC-228	6.4526E-01						
		911.07	6.161E-01	@(P	1.630E-01	8.54E-02	G K
		968.90	1.010E+00	+ P	3.829E-01	1.82E-01	G
		338.40	7.157E-01	@(P	3.399E-01	1.28E-01	G
TH-227	-8.5915E-03						
		236.00	-8.591E-03	%(P	4.685E-01	1.37E-01	G K
		256.25	-7.801E-02	% P	6.097E-01	1.78E-01	G
PA-234	9.0773E-03						
		98.44	9.077E-03	%(	1.886E-01	5.58E-02	G K
		946.00	-1.801E-02	%	3.090E-01	8.54E-02	G
		131.28	-6.292E-02	%	2.324E-01	6.96E-02	G
		94.67	-1.067E-01	%	3.675E-01	1.10E-01	G
		883.24	0.000E+00	&	5.399E-01	1.49E-01	G
		926.70	1.335E-01	%	4.438E-01	1.29E-01	G

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 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26 5.326E-02 %   4.431E-01 1.26E-01 G

TH-234       1.6413E+00
                           63.29 1.121E+00 %(P 2.343E+00 7.07E-01 G K
                           92.80 1.935E+00 @(P 1.780E+00 5.55E-01 G
                           92.38 2.088E+00 @(P 2.150E+00 6.65E-01 G

AM-241      -4.0553E-03
                           59.54-4.055E-03 &(P 3.322E-01 9.81E-02 G
   ( - This peak used in the nuclide activity average.

   * - Peak is too wide, but only one peak in library.
   ! - Peak is part of a multiplet and this area went
       negative during deconvolution.
   ? - Peak is too narrow.
   @ - Peak is too wide at FW25M, but ok at FWHM.
   % - Peak fails sensitivity test.
   $ - Peak identified, but first peak of this nuclide
       failed one or more qualification tests.
   + - Peak activity higher than counting uncertainty range.
   - - Peak activity lower than counting uncertainty range.
   = - Peak outside analysis energy range.
   & - Calculated peak centroid is not close enough to the
       library energy centroid for positive identification.
   P - Peakbackground subtraction
   } - Peak is too close to another for the activity
       to be found directly.

   Nuclide Codes:                      Peak Codes:
   T - Thermal Neutron Activation      G - Gamma Ray
   F - Fast Neutron Activation         X - X-Ray
   I - Fission Product                 P - Positron Decay
   N - Naturally Occurring Isotope     S - Single-Escape
   P - Photon Reaction                 D - Double-Escape
   C - Charged Particle Reaction       K - Key Line
   M - No MDA Calculation              A - Not in Average
   R - Coincidence Corrected           C - Coincidence Peak
   H - Halflife limit exceeded

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
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***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	2.6544E-02	2.8299E-02	3.5190E-01	3.5190E-01	3.904E-01
K-40		1.0726E+01	1.0726E+01	1.7881E+00	1.8880E+00	
MN-54	#A	2.5230E-02	2.5507E-02	4.6826E-02	4.6848E-02	5.078E-02
CO-57	#B	-9.2615E-04	-9.3794E-04	4.5721E-02	4.5721E-02	5.104E-02
CO-60	#B	1.2044E-02	1.2065E-02	4.4628E-02	4.4633E-02	5.318E-02

Sr-85	#A	-1.9223E-02	-2.0264E-02	6.2084E-02	6.2094E-02	6.613E-02
Kr-85	#A	-4.8071E+02	-4.8073E+02	1.5836E+03	1.5838E+03	1.535E+03
Y-88	#B	-7.0366E-03	-7.2658E-03	4.9969E-02	4.9971E-02	6.151E-02
NB-94	#B	-7.6703E-03	-7.6703E-03	4.6866E-02	4.6868E-02	5.191E-02
Ag-108M	#B	1.0750E-02	1.0751E-02	4.4261E-02	4.4265E-02	5.162E-02
CD-109	#A	1.2312E-01	1.2405E-01	1.4795E+00	1.4795E+00	1.645E+00
SN-113	#B	-1.0021E-02	-1.0323E-02	6.8655E-02	6.8658E-02	7.633E-02
SB-125	#B	-1.6021E-02	-1.6075E-02	1.4273E-01	1.4274E-01	1.423E-01
I-131	#B	-1.0306E-02	-1.5765E-02	6.6580E-02	6.6586E-02	4.960E-02
CS-134	#B	-2.7309E-03	-2.7433E-03	1.0809E-01	1.0809E-01	5.974E-02
CS-137	#	2.6659E-01	2.6667E-01	9.1195E-02	9.2431E-02	
CE-139	#A	-5.0954E-03	-5.2236E-03	5.3527E-02	5.3528E-02	5.426E-02
EU-152	#B	2.5522E-03	2.5540E-03	1.2787E-01	1.2787E-01	1.447E-01
EU-154	#B	-6.5572E-04	-6.5644E-04	3.8434E-01	3.8434E-01	1.054E-01
EU-155	#B	1.7158E-02	1.7190E-02	1.8386E-01	1.8386E-01	2.052E-01
HG-203	#B	5.5731E-03	5.9972E-03	3.8873E-02	3.8874E-02	4.144E-02
TL-208		1.8463E-01	1.8463E-01	8.4220E-02	8.4863E-02	
PB-212	#	5.0536E-01	5.0536E-01	1.2785E-01	1.3100E-01	1.124E-01
PB-214	#	4.5003E-01	4.5003E-01	1.2800E-01	1.3050E-01	1.243E-01
BI-212	#	4.7609E-01	4.7609E-01	4.3703E-01	4.3785E-01	4.313E-01
BI-214	#	6.5085E-01	6.5085E-01	2.0661E-01	2.0985E-01	
RA-224	#	1.6599E+00	1.6599E+00	1.2014E+00	1.2050E+00	1.246E+00
RA-226	#	1.4212E+00	1.4212E+00	1.2794E+00	1.2819E+00	1.356E+00
AC-228		6.4526E-01	6.4526E-01	2.1914E-01	2.2215E-01	
TH-227	#B	-8.5915E-03	-8.5915E-03	7.5048E-01	7.5048E-01	4.685E-01
PA-234	#B	9.0773E-03	9.0773E-03	1.6730E-01	1.6730E-01	1.886E-01
TH-234	#B	1.6413E+00	1.6413E+00	1.2519E+00	1.2552E+00	2.343E+00
AM-241	#A	-4.0553E-03	-4.0553E-03	1.7446E+00	1.7446E+00	3.322E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (295.1 to 1999.1 keV) 1.2473514E+01 pCi/gm
Total Decayed Activity (295.1 to 1999.1 keV) 1.2473597E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JPK

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 101F_5SEPT2006_1417.An1

Sample description
FSS-OOL-05-07-007-F

Spectrum Filename: C:\GammaVision\Spectra\101F_5SEPT2006_1417.An1

Acquisition information
Start time: 05-Sep-2006 14:17:06
Live time: 2000
Real time: 2002
Dead time: 0.09 %
Detector ID: 1

Detector system
Det 101- DSPE-633

Calibration
Filename: D1_1LSa.Clb
Detector 101 1.0 Liter Marinelli Sand

Energy Calibration
Created: 03-Sep-2004 08:50:48
Zero offset: 0.244 keV
Gain: 0.500 keV/channel
Quadratic: -2.493E-08 keV/channel^2

Efficiency Calibration
Created: 03-Sep-2004 08:52:26
Type: Polynomial
Uncertainty: 0.626 %
Coefficients: -0.321775 -5.816463 0.734234
-0.099357 0.006049 -0.000149

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.23keV)
Stop channel: 4000 (1999.11keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 1.3300E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.3300E+03) =
7.5188E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	31-Aug-2006 14:15:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	101_150K_28APR05.Pbc 01-May-2005 05:24:47
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 14 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.0785

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
74.74	195.	14.42	1.00	1.651E-02				
74.74	195.	14.42	1.00	1.651E-02	74.81	9.600	1.214E+00	PB212
77.01	184.	20.77	1.50	1.720E-02	77.11	10.700	1.015E+00	PB214
					77.11	17.500	PBC<MDA	PB212
77.01	188.	20.77	1.50	1.720E-02	77.11	10.700	1.015E+00	PB214
					77.11	17.500	6.334E-01	PB212
84.18	60.	37.49	1.01	1.874E-02				
87.13	120.	19.83	1.01	1.920E-02	86.45	32.740	1.950E-01	EU155
89.78	55.	38.15	1.02	1.955E-02	88.04	3.790	PBC<MDA	CD109
93.22	103.	21.76	1.02	1.994E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
129.31	103.	28.79	1.32	2.109E-02				
129.31	103.	28.79	1.32	2.109E-02	131.28	20.000	2.489E-01	PA234
186.02	114.	24.68	1.00	1.858E-02	185.99	3.280	1.892E+00	RA226
238.79	608.	4.72	1.12	1.557E-02	238.63	43.100	9.113E-01	PB212
238.85	328.	9.35	1.50	1.540E-02	238.63	43.100	PBC<MDA	PB212
241.72	75.	26.09	1.12	1.541E-02	241.00	3.900	PBC<MDA	RA224
270.42	87.	25.95	1.30	1.399E-02				
277.30	48.	36.64	1.32	1.368E-02				
295.36	121.	12.96	1.16	1.291E-02	295.22	19.200	4.901E-01	PB214
300.08	32.	37.97	1.16	1.272E-02				
338.51	114.	13.94	0.89	1.135E-02	338.40	12.010	8.335E-01	AC228
351.95	178.	10.08	0.87	1.093E-02				
351.95	178.	10.08	0.87	1.093E-02	351.99	37.100	4.408E-01	PB214
462.83	40.	31.62	1.17	8.354E-03				
462.83	40.	31.62	1.17	8.354E-03	463.51	10.000	4.712E-01	SB125
511.01	78.	21.76	1.57	7.586E-03	510.72	22.500	3.687E-01	TL208

583.24	168.	9.93	1.44	6.683E-03	583.14	86.000	2.927E-01	TL208
609.45	167.	10.73	1.38	6.411E-03	609.32	46.090	5.717E-01	BI214
661.96	90.	16.96	1.40	5.935E-03	661.62	84.620	1.809E-01	CS137
727.39	56.	19.23	1.43	5.441E-03	727.17	11.800	8.752E-01	BI212
795.00	23.	32.18	1.50	5.016E-03	795.76	85.400	5.484E-02	CS134
911.25	124.	11.11	1.59	4.446E-03	911.07	29.000	9.639E-01	AC228
968.07	93.	14.06	2.36	4.215E-03	968.90	17.460	1.275E+00	AC228

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
1120.23	45.	25.00	2.09	3.711E-03	1120.28	15.040	8.123E-01	BI214
1460.74	402.	5.04	1.81	2.942E-03	1460.75	10.700	1.288E+01	K40
1764.82	13.	37.96	2.11	2.481E-03	1764.51	15.920	PBC<MDA	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
179.13	89.81	192.	55.	0.027	114.44	1.016	PB-214	lD
477.28	238.73	108.	608.	0.304	14.16	1.122	PB-212	D
483.14	241.66	155.	75.	0.038	78.27	1.124	PB-214	D
540.57	270.42	149.	87.	0.043	77.84	1.296	AC-228	s
554.34	277.30	109.	52.	0.026	95.76	1.322	TL-208	
599.91	300.11	59.	32.	0.016	113.92	1.165	PB-212	lD

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-212	149.28	74.85	722.	163.	0.082	71.28	1.499s
PB-214	153.79	77.11	670.	184.	0.092	62.31	1.499D
PB-212	153.79	77.11	666.	188.	0.094	62.31	1.499D
EU-155	173.78	87.10	608.	91.	0.045	119.56	1.499s
TH-234	185.70	93.06	489.	124.	0.062	76.41	1.499
PA-234	257.60	129.00	317.	70.	0.035	114.15	1.499
RA-226	371.76	186.05	296.	105.	0.053	75.26	1.499s
PB-212	477.25	238.78	285.	470.	0.235	20.25	1.499
PB-214	477.41	238.85	308.	328.	0.164	28.05	1.499s
PB-214	590.39	295.32	120.	92.	0.046	58.07	1.499
AC-228	676.81	338.51	68.	112.	0.056	41.82	0.889
PB-214	703.68	351.94	87.	173.	0.086	31.93	1.499
SB-125	925.81	462.96	50.	34.	0.017	96.54	1.499
TL-208	1021.97	511.01	86.	62.	0.031	65.27	1.575s
TL-208	1166.49	583.24	40.	166.	0.083	29.78	1.445s
BI-214	1218.95	609.45	47.	166.	0.083	32.18	1.381s
CS-137	1324.00	661.96	45.	89.	0.045	50.88	1.404s
BI-212	1454.93	727.39	25.	55.	0.028	57.70	1.429
CS-134	1590.23	795.00	17.	23.	0.012	96.54	1.502s
AC-228	1822.85	911.25	25.	122.	0.061	33.32	1.592

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
AC-228	1936.55	968.07	27.	92.	0.046	42.18	2.361s
BI-214	2241.04	1120.23	24.	45.	0.022	75.01	2.086s
K-40	2922.49	1460.74	5.	399.	0.200	15.13	1.812
BI-214	3531.08	1764.82	6.	13.	0.006	113.89	2.106s

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	Peak MDA Value pCi/gm	COMMENTS
BE-7		1.7698E-01					
			477.56	1.770E-01	%(	4.818E-01 1.44E-01 G	
K-40		1.2884E+01					
			1460.75	1.288E+01	(P	4.162E-01 6.54E-01 G	
MN-54		-9.9329E-03					
			834.81	-9.933E-03	&(P	6.823E-02 1.94E-02 G	
CO-57		5.4336E-03					
			122.07	5.434E-03	%(	4.631E-02 1.37E-02 G K	
			136.43	1.731E-01	%	4.471E-01 1.35E-01 G	
CO-60		1.1020E-02					
			1332.51	1.102E-02	%(P	6.641E-02 1.85E-02 G K	
			1173.23	2.099E-02	% P	6.059E-02 1.78E-02 G K	
Sr-85		-2.7235E-02					
			514.00	-2.723E-02	%(	7.420E-02 2.22E-02 G	
Kr-85		-6.4612E+02					
			513.99	-6.461E+02	%(P	1.646E+03 4.91E+02 G	
Y-88		0.0000E+00					
			1836.01	0.000E+00	&(	7.322E-02 1.86E-02 G K	
			898.02	-7.454E-03	% P	5.750E-02 1.59E-02 G	
NB-94		-1.4601E-02					
			871.10	-1.460E-02	%(P	6.805E-02 1.96E-02 G K	
			702.50	1.337E-02	& P	5.951E-02 1.73E-02 G K	
Ag-108M		-2.5137E-02					
			722.95	-2.514E-02	%(	8.328E-02 2.47E-02 G K	
			614.37	-1.237E-02	% P	6.781E-02 1.97E-02 G	

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
		433.93	-1.239E-02	%	5.542E-02	1.63E-02	G
CD-109	-1.1424E-01						
		88.04	-1.142E-01	%(P	1.591E+00	4.73E-01	G
SN-113	-6.7574E-03						
		391.71	-6.757E-03	%(	7.807E-02	2.26E-02	G K
		255.04	-5.689E-01	% P	2.215E+00	6.59E-01	G
SB-125	8.8238E-02						
		427.95	-2.424E-02	&(P	1.476E-01	4.26E-02	G K
		600.77	-1.101E-02	& P	3.046E-01	8.57E-02	G
		636.15	4.841E-02	& P	3.998E-01	1.12E-01	G
		463.51	4.212E-01	(P	4.369E-01	1.41E-01	G
		176.29	5.865E-02	& P	6.287E-01	1.85E-01	G
I-131	1.3979E-02						
		364.48	1.398E-02	%(	8.079E-02	2.36E-02	G K
		636.97	0.000E+00	&	1.123E+00	3.12E-01	G
		284.29	6.733E-03	%	8.307E-01	2.37E-01	G
CS-134	2.5059E-02						
		604.66	-1.001E-03	%(P	1.201E-01	3.51E-02	G K
		795.76	5.484E-02	(P	5.242E-02	1.80E-02	G
		569.29	3.065E-02	& P	2.629E-01	7.36E-02	G
		801.84	-5.596E-02	%	6.554E-01	1.83E-01	G
CS-137	1.8088E-01						
		661.62	1.809E-01	@(P	6.843E-02	3.10E-02	G
CE-139	8.5719E-03						
		165.85	8.572E-03	%(P	5.856E-02	1.74E-02	G
EU-152	2.3068E-02						
		121.78	2.307E-02	%(P	1.647E-01	4.90E-02	G K
		344.30	2.377E-02	& P	1.790E-01	5.22E-02	G
		1408.08	7.523E-02	% P	2.907E-01	8.25E-02	G
		964.00	1.127E-02	% P	1.173E+00	3.43E-01	G
		1112.07	1.114E-01	% P	3.865E-01	1.11E-01	G
		778.90	9.019E-03	% P	3.768E-01	1.02E-01	G
EU-154	-1.6230E-02						
		123.10	-1.623E-02	&(P	9.768E-02	2.89E-02	G K
		1274.80	-1.920E-04	% P	2.804E-01	7.80E-02	G
		723.30	-4.958E-02	% P	3.381E-01	9.68E-02	G
		1004.80	-3.468E-02	% P	3.473E-01	9.61E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
EU-155	1.4770E-01						
		86.45	1.477E-01	*(	1.915E-01	5.89E-02	G K
		105.31	5.479E-02	%	2.324E-01	6.96E-02	G
HG-203	-5.5930E-03						
		279.17	-5.593E-03	%(	6.037E-02	1.77E-02	G K
		72.87	-1.604E-01	% P	1.397E+00	4.16E-01	G
		70.83	9.331E-03	&	2.143E+00	6.34E-01	G
		82.50	-1.666E+00	%	3.260E+00	9.90E-01	G
TL-208	3.0849E-01						
		583.14	2.927E-01	*(P	5.713E-02	2.95E-02	G
		510.72	3.687E-01	*(P	2.733E-01	1.01E-01	G
PB-212	6.8939E-01						
		238.63	7.121E-01	(P	1.232E-01	4.87E-02	G K
							Energy duplication
		77.11	6.334E-01	@(	4.150E-01	1.32E-01	G
		74.81	1.044E+00	& P	8.187E-01	2.56E-01	G
PB-214	4.1406E-01						
		351.99	4.329E-01	(P	1.160E-01	4.66E-02	G K
		295.22	3.776E-01	(P	2.204E-01	7.45E-02	G
							Energy duplication
		77.11	1.015E+00	+ P	6.806E-01	2.15E-01	G
		241.92	2.895E+00	+ P	7.460E-01	2.71E-01	G
BI-212	8.7519E-01						
		727.17	8.752E-01	(P	4.091E-01	1.70E-01	G K
		1620.56	5.882E-01	&	2.008E+00	5.72E-01	G
		785.42	1.705E+00	% P	2.297E+00	7.39E-01	G
BI-214	5.7167E-01						
		609.32	5.717E-01	@(P	1.188E-01	6.17E-02	G K
		1764.51	3.235E-01	- P	3.666E-01	1.27E-01	G
		1120.28	8.123E-01	+ P	4.682E-01	2.05E-01	G
RA-224	9.4679E-01						
		241.00	9.468E-01	%(P	1.564E+00	4.78E-01	G
RA-226	1.7552E+00						
		185.99	1.755E+00	@(	1.382E+00	4.40E-01	G
AC-228	1.0808E+00						
		911.07	9.639E-01	(P	2.037E-01	1.09E-01	G K
		968.90	1.275E+00	*(P	3.702E-01	1.81E-01	G
		338.40	8.335E-01	- P	3.070E-01	1.19E-01	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments

TH-227      -2.0201E-01
                          236.00-2.020E-01 %(P 5.459E-01 1.64E-01 G K
                          256.25-1.643E-01 % P 6.367E-01 1.89E-01 G

PA-234       8.0887E-02
                           98.44 1.134E-02 %(  2.012E-01 5.96E-02 G K
                          946.00 3.161E-02 %   2.909E-01 8.09E-02 G
                          131.28 1.682E-01 &(  2.067E-01 6.40E-02 G
                           94.67 6.951E-03 %   3.627E-01 1.07E-01 G
                          883.24-6.358E-02 &   5.095E-01 1.44E-01 G
                          926.70 5.668E-03 &   4.869E-01 1.31E-01 G
                          569.26 5.015E-02 &   3.859E-01 1.09E-01 G

TH-234       1.0120E+00
                           63.29 1.689E-01 %(P 2.602E+00 7.70E-01 G K
                           92.80 2.108E+00  (P 1.801E+00 5.64E-01 G
                           92.38-3.222E-01 % P 2.390E+00 7.04E-01 G

AM-241       3.3795E-02
                           59.54 3.380E-02 &(P 3.384E-01 1.01E-01 G
   ( - This peak used in the nuclide activity average.

   * - Peak is too wide, but only one peak in library.
   ! - Peak is part of a multiplet and this area went
       negative during deconvolution.
   ? - Peak is too narrow.
   @ - Peak is too wide at FW25M, but ok at FWHM.
   % - Peak fails sensitivity test.
   $ - Peak identified, but first peak of this nuclide
       failed one or more qualification tests.
   + - Peak activity higher than counting uncertainty range.
   - - Peak activity lower than counting uncertainty range.
   = - Peak outside analysis energy range.
   & - Calculated peak centroid is not close enough to the
       library energy centroid for positive identification.
   P - Peakbackground subtraction
   } - Peak is too close to another for the activity
       to be found directly.

   Nuclide Codes:                      Peak Codes:
   T - Thermal Neutron Activation      G - Gamma Ray
   F - Fast Neutron Activation         X - X-Ray
   I - Fission Product                 P - Positron Decay
   N - Naturally Occurring Isotope     S - Single-Escape
   P - Photon Reaction                 D - Double-Escape
   C - Charged Particle Reaction       K - Key Line
   M - No MDA Calculation              A - Not in Average
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R - Coincidence Corrected C - Coincidence Peak
H - Halflife limit exceeded

- -

***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	1.6585E-01	1.7698E-01	4.3128E-01	4.3139E-01	4.515E-01
K-40		1.2884E+01	1.2884E+01	1.9610E+00	2.0917E+00	
MN-54	#A	-9.8232E-03	-9.9329E-03	6.9538E-02	6.9540E-02	6.748E-02
CO-57	#B	5.3643E-03	5.4336E-03	4.1102E-02	4.1103E-02	4.572E-02
CO-60	#B	1.1000E-02	1.1020E-02	5.5441E-02	5.5445E-02	6.629E-02
Sr-85	#A	-2.5817E-02	-2.7235E-02	6.6711E-02	6.6728E-02	7.034E-02
Kr-85	#A	-6.4610E+02	-6.4612E+02	1.6514E+03	1.6518E+03	1.646E+03
Y-88	#B	0.0000E+00	0.0000E+00	5.5765E-02	5.5765E-02	7.088E-02
NB-94	#B	-1.4601E-02	-1.4601E-02	6.1296E-02	6.1302E-02	6.805E-02
Ag-108M	#B	-2.5135E-02	-2.5137E-02	7.3966E-02	7.3979E-02	8.327E-02
CD-109	#A	-1.1337E-01	-1.1424E-01	1.5913E+00	1.5913E+00	1.579E+00
SN-113	#B	-6.5569E-03	-6.7574E-03	6.7739E-02	6.7740E-02	7.576E-02
SB-125	#B	8.7936E-02	8.8238E-02	8.8762E-02	8.8902E-02	1.471E-01
I-131	#B	9.0825E-03	1.3979E-02	7.0698E-02	7.0702E-02	5.249E-02
CS-134	#B	2.4944E-02	2.5059E-02	2.4632E-02	2.4672E-02	1.196E-01
CS-137	#	1.8082E-01	1.8088E-01	9.2936E-02	9.3496E-02	
CE-139	#A	8.3585E-03	8.5719E-03	5.2165E-02	5.2167E-02	5.710E-02
EU-152	#B	2.3051E-02	2.3068E-02	1.4702E-01	1.4703E-01	1.646E-01
EU-154	#B	-1.6212E-02	-1.6230E-02	9.9244E-02	9.9248E-02	9.758E-02
EU-155	#A	1.4742E-01	1.4770E-01	1.7659E-01	1.7678E-01	1.912E-01
HG-203	#B	-5.1919E-03	-5.5930E-03	5.2999E-02	5.3000E-02	5.604E-02
TL-208	#	3.0849E-01	3.0849E-01	9.3200E-02	9.4816E-02	
PB-212	#	6.8939E-01	6.8939E-01	1.4142E-01	1.4668E-01	1.232E-01
PB-214	#	4.1406E-01	4.1406E-01	1.3372E-01	1.3575E-01	1.160E-01
BI-212		8.7519E-01	8.7519E-01	5.1115E-01	5.1354E-01	
BI-214		5.7167E-01	5.7167E-01	1.8519E-01	1.8799E-01	
RA-224	#A	9.4679E-01	9.4679E-01	1.4331E+00	1.4341E+00	1.564E+00
RA-226	#	1.7552E+00	1.7552E+00	1.3209E+00	1.3247E+00	1.382E+00
AC-228		1.0808E+00	1.0808E+00	2.9360E-01	2.9988E-01	
TH-227	#B	-2.0201E-01	-2.0201E-01	5.0556E-01	5.0569E-01	5.459E-01
PA-234	#B	8.0887E-02	8.0887E-02	9.2331E-02	9.2440E-02	2.012E-01
TH-234	#B	1.0120E+00	1.0120E+00	8.1193E-01	8.1387E-01	2.602E+00
AM-241	#A	3.3795E-02	3.3795E-02	3.0153E-01	3.0154E-01	3.384E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.

H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (270.1 to 1999.1 keV) 1.5900490E+01 pCi/gm
Total Decayed Activity (270.1 to 1999.1 keV) 1.5900547E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JPK

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 101F_5SEPT2006_1544.An1

Sample description
FSS-OOL-05-07-005-F

Spectrum Filename: C:\GammaVision\Spectra\101F_5SEPT2006_1544.An1

Acquisition information

Start time:	05-Sep-2006 15:44:24
Live time:	2000
Real time:	2002
Dead time:	0.10 %
Detector ID:	1

Detector system
Det 101- DSPE-633

Calibration

Filename:	D1_1LSa.Clb

Detector 101 1.0 Liter Marinelli Sand

Energy Calibration

Created:	03-Sep-2004 08:50:48
Zero offset:	0.244 keV
Gain:	0.500 keV/channel
Quadratic:	-2.493E-08 keV/channel^2

Efficiency Calibration

Created:	03-Sep-2004 08:52:26
Type:	Polynomial
Uncertainty:	0.626 %
Coefficients:	-0.321775 -5.816463 0.734234
	-0.099357 0.006049 -0.000149

Library Files

Main analysis library:	FSS_Rev_1.Lib
Library Match Width:	1.000
Peak stripping:	Library based

Analysis parameters

Analysis engine:	Env32 G53W4.20
Start channel:	100 (50.23keV)
Stop channel:	4000 (1999.11keV)
Peak rejection level:	41.667%
Peak search sensitivity:	3
Sample Size:	1.8350E+03
Activity scaling factor:	1.0000E+06/(1.0000E+00* 1.8350E+03) = 5.4496E+02
Detection limit method:	Nureg 4.16
Random error:	1.0000000E+00
Systematic error:	1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	31-Aug-2006 14:02:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	101_150K_28APR05.Pbc 01-May-2005 05:24:47
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 15 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.1267

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
74.81	178.	24.66	1.50	1.654E-02				
74.81	178.	24.66	1.50	1.654E-02	74.81	9.600	8.269E-01	PB212
77.09	275.	15.82	1.50	1.720E-02	77.11	10.700	1.101E+00	PB214
					77.11	17.500	6.732E-01	PB212
77.09	279.	15.82	1.50	1.720E-02	77.11	10.700	1.101E+00	PB214
					77.11	17.500	6.823E-01	PB212
87.00	126.	21.59	1.01	1.917E-02	86.45	32.740	1.487E-01	EU155
90.07	79.	26.36	0.49	1.959E-02				
93.23	130.	21.16	1.02	1.993E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
129.50	74.	34.64	1.18	2.109E-02				
185.78	105.	28.54	0.88	1.860E-02	185.99	3.280	1.271E+00	RA226
209.24	88.	27.28	0.98	1.722E-02				
238.79	773.	4.16	1.12	1.557E-02	238.63	43.100	8.417E-01	PB212
241.62	105.	20.47	1.12	1.542E-02	241.00	3.900	1.271E+00	RA224
					241.92	7.470	PBC<MDA	PB214
270.48	82.	29.56	1.17	1.399E-02				
295.19	138.	18.01	1.15	1.292E-02				
295.19	138.	18.01	1.15	1.292E-02	295.22	19.200	4.056E-01	PB214
338.52	165.	12.25	1.22	1.135E-02	338.40	12.010	8.818E-01	AC228
352.05	220.	12.36	1.25	1.092E-02	351.99	37.100	3.965E-01	PB214
409.72	39.	40.75	0.81	9.415E-03				
462.93	79.	22.78	0.97	8.352E-03				
462.93	79.	22.78	0.97	8.352E-03	463.51	10.000	6.835E-01	SB125
510.47	120.	19.00	1.85	7.594E-03	510.72	22.500	4.483E-01	TL208
583.10	211.	8.68	1.43	6.685E-03	583.14	86.000	2.673E-01	TL208
600.66	18.	34.91	1.50	6.459E-03	600.77	18.400	PBC<MDA	SB125

					604.66	97.600	PBC<MDA	CS134
609.26	185.	10.27	1.49	6.413E-03	609.32	46.090	4.582E-01	BI214
661.68	82.	21.87	1.02	5.937E-03	661.62	84.620	1.182E-01	CS137
727.62	74.	21.91	1.63	5.440E-03	727.17	11.800	8.384E-01	BI212
794.88	24.	36.41	1.50	5.016E-03	795.76	85.400	PBC<MDA	CS134
911.13	134.	13.20	1.61	4.446E-03	911.07	29.000	7.558E-01	AC228
968.42	124.	15.01	1.60	4.214E-03	968.90	17.460	1.236E+00	AC228

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
1119.92	43.	35.64	0.75	3.711E-03	1120.28	15.040	5.676E-01	BI214
1174.01	45.	31.18	0.80	3.565E-03	1173.23	99.860	9.378E-02	CO60
1332.56	45.	21.47	0.82	3.190E-03	1332.51	99.980	1.050E-01	CO60
1460.81	547.	4.36	1.90	2.942E-03	1460.75	10.700	1.275E+01	K40
1764.70	23.	22.91	2.71	2.481E-03	1764.51	15.920	4.243E-01	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide
173.58	86.95	307.	126.	0.063	64.76	1.014	TB-160 lD
418.15	209.24	222.	88.	0.044	81.85	0.983	AC-228 s
477.29	238.63	131.	773.	0.387	12.48	1.122	PB-212 D
482.94	241.46	177.	105.	0.052	61.42	1.124	RA-224 D
540.68	270.48	189.	82.	0.041	88.68	1.166	AC-228 s
819.28	409.72	78.	39.	0.019	122.24	0.808	AC-228 s

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
HG-203	146.14	73.29	925.	-108.	-0.054	123.19	1.499
PB-212	149.18	74.81	938.	178.	0.089	73.98	1.499
PB-214	153.79	77.11	838.	275.	0.138	47.45	1.499D
PB-212	153.79	77.11	834.	279.	0.139	47.45	1.499D
TH-234	185.88	93.15	772.	144.	0.072	79.28	1.499s
TH-234	185.83	93.13	747.	150.	0.075	77.91	1.499s
RA-226	371.67	186.01	287.	101.	0.051	80.21	0.881s
PB-212	476.96	238.63	346.	626.	0.313	17.20	1.499D
RA-224	482.86	241.58	444.	85.	0.042	109.65	1.499
PB-214	590.36	295.31	201.	129.	0.065	52.65	1.499s
AC-228	676.83	338.52	109.	163.	0.082	36.75	1.222
PB-214	704.04	352.12	119.	179.	0.089	33.85	1.499
SB-125	926.06	463.08	75.	66.	0.033	65.11	1.499s
TL-208	1020.87	510.47	124.	104.	0.052	56.99	1.846s
TL-208	1166.22	583.10	50.	209.	0.104	26.05	1.430
CS-134	1201.35	600.66	13.	18.	0.009	104.73	1.499s
BI-214	1218.55	609.26	56.	184.	0.092	30.81	1.489s
CS-137	1323.45	661.68	68.	81.	0.040	65.62	1.024

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
BI-212	1455.39	727.62	56.	73.	0.037	65.73	1.628s
CS-134	1589.99	794.88	27.	24.	0.012	109.23	1.502s
AC-228	1822.61	911.13	55.	132.	0.066	39.59	1.609s
AC-228	1937.25	968.42	60.	123.	0.062	45.04	1.602s
BI-214	2240.43	1119.92	58.	43.	0.022	106.92	0.748s
CO-60	2348.66	1174.01	46.	45.	0.023	93.55	0.796s
CO-60	2665.98	1332.56	14.	45.	0.023	64.42	0.817s
K-40	2922.63	1460.81	8.	545.	0.272	13.09	1.905
BI-214	3530.84	1764.70	2.	23.	0.011	68.72	2.714s

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	Peak MDA Value pCi/gm	COMMENTS
BE-7		-5.8333E-03					
			477.56	-5.833E-03	&(	4.089E-01 1.17E-01	G
K-40		1.2746E+01					
			1460.75	1.275E+01	(P	3.732E-01 5.58E-01	G
MN-54		9.8153E-03					
			834.81	9.815E-03	&(P	4.333E-02 1.25E-02	G
CO-57		6.3721E-03					
			122.07	6.372E-03	%(	4.459E-02 1.33E-02	G K
			136.43	1.437E-02	&	3.583E-01 1.06E-01	G
CO-60		9.9417E-02					
			1332.51	1.050E-01	(P	4.600E-02 2.26E-02	G K
			1173.23	9.378E-02	(P	7.094E-02 2.94E-02	G K
Sr-85		-1.8334E-02					
			514.00	-1.833E-02	&(	6.071E-02 1.81E-02	G
Kr-85		-4.2773E+02					
			513.99	-4.277E+02	&(P	1.333E+03 3.96E+02	G
Y-88		1.9988E-02					
			1836.01	1.999E-02	%(	3.836E-02 1.20E-02	G K
			898.02	2.194E-02	% P	4.821E-02 1.46E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
NB-94	-1.0053E-02						
		871.10	-1.005E-02	%(P	4.316E-02	1.24E-02	G K
		702.50	-2.209E-03	% P	3.591E-02	9.95E-03	G K
Ag-108M	-1.6675E-02						
		722.95	-1.667E-02	%(	6.658E-02	1.96E-02	G K
		614.37	-1.796E-02	& P	4.893E-02	1.46E-02	G
		433.93	7.462E-03	%	4.401E-02	1.29E-02	G
CD-109	-7.0329E-01						
		88.04	-7.033E-01	%(P	1.379E+00	4.19E-01	G
SN-113	-1.1147E-02						
		391.71	-1.115E-02	%(	7.195E-02	2.12E-02	G K
		255.04	-3.229E-01	% P	1.883E+00	5.58E-01	G
SB-125	1.3563E-01						
		427.95	-1.602E-02	%(P	1.390E-01	4.04E-02	G K
		600.77	8.729E-03	% P	2.078E-01	5.84E-02	G
		636.15	1.096E-01	& P	3.099E-01	9.17E-02	G
		463.51	5.845E-01	*(P	3.810E-01	1.30E-01	G
		176.29	7.998E-02	% P	5.251E-01	1.56E-01	G
I-131	6.4303E-04						
		364.48	6.430E-04	&(	6.614E-02	1.90E-02	G K
		636.97	-1.047E-01	&	9.150E-01	2.62E-01	G
		284.29	-5.947E-02	&	9.573E-01	2.80E-01	G
CS-134	3.0607E-02						
		604.66	2.137E-02	?(P	2.276E-02	7.72E-03	G K
		795.76	4.116E-02	(P	4.671E-02	1.52E-02	G
		569.29	-5.476E-02	% P	2.648E-01	7.67E-02	G
		801.84	4.805E-02	%	5.023E-01	1.41E-01	G
CS-137	1.1820E-01						
		661.62	1.182E-01	(P	6.048E-02	2.61E-02	G
CE-139	1.0367E-02						
		165.85	1.037E-02	&(P	4.112E-02	1.23E-02	G
EU-152	1.3932E-02						
		121.78	1.393E-02	%(P	1.334E-01	3.97E-02	G K
		344.30	2.489E-03	% P	1.360E-01	3.93E-02	G
		1408.08	4.505E-02	& P	1.713E-01	4.80E-02	G
		964.00	8.166E-03	% P	9.120E-01	2.67E-01	G
		1112.07	-7.330E-04	& P	5.042E-01	1.41E-01	G
		778.90	-4.933E-02	% P	4.020E-01	1.15E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
EU-154	7.4975E-03						
		123.10	7.497E-03	%(P	8.904E-02	2.64E-02	G K
		1274.80	-1.841E-02	& P	1.955E-01	5.52E-02	G
		723.30	-8.240E-02	% P	3.063E-01	9.02E-02	G
		1004.80	3.011E-02	% P	3.084E-01	8.69E-02	G
EU-155	1.1332E-01						
		86.45	1.133E-01	%(	1.627E-01	4.98E-02	G K
		105.31	5.560E-02	%	1.930E-01	5.80E-02	G
HG-203	-1.5253E-03						
		279.17	-1.525E-03	&(	4.838E-02	1.41E-02	G K
		72.87	-6.232E-01	% P	1.293E+00	3.92E-01	G
		70.83	-1.607E+00	+	2.154E+00	6.60E-01	G
		82.50	-8.654E-01	%	2.679E+00	8.07E-01	G
TL-208	2.6726E-01						
		583.14	2.673E-01	(P	4.584E-02	2.35E-02	G
		510.72	4.483E-01	+ P	2.355E-01	9.83E-02	G
PB-212	6.8512E-01						
							Energy duplication
		238.63	6.863E-01	(P	9.806E-02	3.97E-02	G K
							Energy duplication
		77.11	6.823E-01	(	3.358E-01	1.08E-01	G
		74.81	8.269E-01	& P	6.745E-01	2.10E-01	G
PB-214	3.4495E-01						
		351.99	3.246E-01	(P	9.744E-02	3.70E-02	G K
		295.22	3.843E-01	@(P	2.043E-01	6.84E-02	G
							Energy duplication
		77.11	1.101E+00	+ P	5.504E-01	1.77E-01	G
		241.92	9.292E-03	% P	7.694E-01	2.28E-01	G
BI-212	8.3843E-01						
		727.17	8.384E-01	*(P	4.305E-01	1.86E-01	G K
		1620.56	2.936E-01	&	1.721E+00	4.72E-01	G
		785.42	3.960E-01	% P	2.620E+00	7.54E-01	G
BI-214	4.7256E-01						
		609.32	4.582E-01	@(P	9.373E-02	4.73E-02	G K
		1764.51	4.243E-01	(P	1.805E-01	9.91E-02	G
		1120.28	5.676E-01	(P	5.040E-01	2.04E-01	G
RA-224	1.0335E+00						
		241.00	1.034E+00	(P	1.233E+00	3.81E-01	G
RA-226	1.2227E+00						
		185.99	1.223E+00	@(	9.863E-01	3.27E-01	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments

AC-228       7.9267E-01
                          911.07 7.558E-01  (P 2.122E-01 1.01E-01 G K
                          968.90 1.236E+00 + P 3.871E-01 1.87E-01 G
                          338.40 8.818E-01  (P 2.772E-01 1.10E-01 G

TH-227      -6.8356E-02
                          236.00-6.836E-02 &(P 4.319E-01 1.29E-01 G K
                          256.25 1.258E-01 & P 4.614E-01 1.37E-01 G

PA-234      -5.2467E-02
                           98.44-5.247E-02 &(  1.514E-01 4.56E-02 G K
                          946.00 5.542E-03 %   2.536E-01 7.03E-02 G
                          131.28-5.310E-02 %   2.108E-01 6.33E-02 G
                           94.67-6.129E-02 %   3.245E-01 9.73E-02 G
                          883.24 2.793E-01 %   3.683E-01 1.18E-01 G
                          926.70-8.336E-02 %   5.472E-01 1.58E-01 G
                          569.26-7.625E-02 %   3.896E-01 1.13E-01 G

TH-234       1.4396E+00
                           63.29 7.047E-01 %(P 2.041E+00 6.13E-01 G K
                           92.80 1.847E+00  (P 1.605E+00 4.99E-01 G
                           92.38 2.080E+00  (P 1.908E+00 5.91E-01 G

AM-241      -2.2415E-02
                           59.54-2.242E-02 %(P 2.987E-01 8.89E-02 G
   ( - This peak used in the nuclide activity average.

   * - Peak is too wide, but only one peak in library.
   ! - Peak is part of a multiplet and this area went
       negative during deconvolution.
   ? - Peak is too narrow.
   @ - Peak is too wide at FW25M, but ok at FWHM.
   % - Peak fails sensitivity test.
   $ - Peak identified, but first peak of this nuclide
       failed one or more qualification tests.
   + - Peak activity higher than counting uncertainty range.
   - - Peak activity lower than counting uncertainty range.
   = - Peak outside analysis energy range.
   & - Calculated peak centroid is not close enough to the
       library energy centroid for positive identification.
   P - Peakbackground subtraction
   } - Peak is too close to another for the activity
       to be found directly.

   Nuclide Codes:                      Peak Codes:
   T - Thermal Neutron Activation      G - Gamma Ray
   F - Fast Neutron Activation         X - X-Ray
```

I - Fission Product
N - Naturally Occurring Isotope
P - Photon Reaction
C - Charged Particle Reaction
M - No MDA Calculation
R - Coincidence Corrected
H - Halflife limit exceeded

P - Positron Decay
S - Single-Escape
D - Double-Escape
K - Key Line
A - Not in Average
C - Coincidence Peak

- -

***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	-5.4617E-03	-5.8333E-03	3.4973E-01	3.4973E-01	3.828E-01
K-40		1.2746E+01	1.2746E+01	1.6750E+00	1.8233E+00	
MN-54	#A	9.7054E-03	9.8153E-03	3.7375E-02	3.7379E-02	4.284E-02
CO-57	#B	6.2897E-03	6.3721E-03	3.9875E-02	3.9876E-02	4.401E-02
CO-60		9.9236E-02	9.9417E-02	5.6624E-02	5.6902E-02	
Sr-85	#A	-1.7366E-02	-1.8334E-02	5.4309E-02	5.4319E-02	5.750E-02
Kr-85	#A	-4.2771E+02	-4.2773E+02	1.3459E+03	1.3461E+03	1.333E+03
Y-88	#B	1.9340E-02	1.9988E-02	3.6145E-02	3.6163E-02	3.712E-02
NB-94	#B	-1.0053E-02	-1.0053E-02	3.8835E-02	3.8839E-02	4.316E-02
Ag-108M	#B	-1.6674E-02	-1.6675E-02	5.8878E-02	5.8886E-02	6.658E-02
CD-109	#A	-6.9786E-01	-7.0329E-01	1.2727E+00	1.2733E+00	1.368E+00
SN-113	#B	-1.0811E-02	-1.1147E-02	6.3492E-02	6.3495E-02	6.978E-02
SB-125	#B	1.3516E-01	1.3563E-01	9.0243E-02	9.0568E-02	1.386E-01
I-131	#B	4.1530E-04	6.4303E-04	5.7004E-02	5.7004E-02	4.272E-02
CS-134	#	3.0464E-02	3.0607E-02	2.3748E-02	2.3811E-02	2.265E-02
CS-137		1.1816E-01	1.1820E-01	7.8408E-02	7.8692E-02	
CE-139	#A	1.0105E-02	1.0367E-02	3.6857E-02	3.6862E-02	4.008E-02
EU-152	#B	1.3922E-02	1.3932E-02	1.1905E-01	1.1906E-01	1.332E-01
EU-154	#B	7.4890E-03	7.4975E-03	7.9266E-02	7.9268E-02	8.894E-02
EU-155	#B	1.1311E-01	1.1332E-01	1.4931E-01	1.4944E-01	1.624E-01
HG-203	#B	-1.4145E-03	-1.5253E-03	4.2397E-02	4.2397E-02	4.487E-02
TL-208		2.6726E-01	2.6726E-01	7.0425E-02	7.2026E-02	
PB-212	#	6.8512E-01	6.8512E-01	1.1898E-01	1.2512E-01	9.806E-02
PB-214	#	3.4495E-01	3.4495E-01	1.0936E-01	1.1108E-01	9.744E-02
BI-212	#	8.3843E-01	8.3843E-01	5.5623E-01	5.5825E-01	
BI-214		4.7256E-01	4.7256E-01	1.4648E-01	1.4889E-01	
RA-224	#A	1.0335E+00	1.0335E+00	1.1429E+00	1.1444E+00	1.233E+00
RA-226	#	1.2227E+00	1.2227E+00	9.8079E-01	9.8322E-01	
AC-228		7.9267E-01	7.9267E-01	2.1706E-01	2.2163E-01	
TH-227	#B	-6.8356E-02	-6.8356E-02	4.0717E-01	4.0719E-01	4.319E-01
PA-234	#B	-5.2467E-02	-5.2467E-02	1.3679E-01	1.3682E-01	1.514E-01
TH-234	#B	1.4396E+00	1.4396E+00	1.1680E+00	1.1707E+00	2.041E+00
AM-241	#A	-2.2415E-02	-2.2415E-02	3.2214E-01	3.2214E-01	2.987E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (270.1 to 1999.1 keV) 1.6556938E+01 pCi/gm
Total Decayed Activity (270.1 to 1999.1 keV) 1.6557165E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JPK

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 101F_31AUG2006_1754.An1

Sample description
FSS-OOL-05-07-004-F-S WET

Spectrum Filename: C:\GammaVision\Spectra\101F_31AUG2006_1754.An1

Acquisition information
Start time: 31-Aug-2006 17:54:28
Live time: 2000
Real time: 2002
Dead time: 0.08 %
Detector ID: 1

Detector system
Det 101- DSPE-633

Calibration
Filename: D1_1LSa.Clb
Detector 101 1.0 Liter Marinelli Sand

Energy Calibration
Created: 03-Sep-2004 08:50:48
Zero offset: 0.244 keV
Gain: 0.500 keV/channel
Quadratic: -2.493E-08 keV/channel^2

Efficiency Calibration
Created: 03-Sep-2004 08:52:26
Type: Polynomial
Uncertainty: 0.626 %
Coefficients: -0.321775 -5.816463 0.734234
-0.099357 0.006049 -0.000149

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.23keV)
Stop channel: 4000 (1999.11keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 1.9870E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.9870E+03) =
5.0327E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	31-Aug-2006 13:14:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	101_150K_28APR05.Pbc 01-May-2005 05:24:47
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 12 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.0806

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
77.14	236.	16.54	1.50	1.720E-02	77.11	10.700	8.709E-01	PB214
					77.11	17.500	5.325E-01	PB212
77.14	239.	16.54	1.50	1.720E-02	77.11	10.700	8.709E-01	PB214
					77.11	17.500	5.409E-01	PB212
93.02	93.	36.26	1.50	1.989E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
93.05	87.	36.93	1.50	1.985E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
186.07	84.	35.62	1.72	1.858E-02	185.99	3.280	9.373E-01	RA226
208.41	98.	27.81	1.10	1.727E-02				
238.66	453.	5.74	1.12	1.557E-02	238.63	43.100	4.525E-01	PB212
					241.92	7.470	2.672E+00	PB214
241.99	73.	23.63	1.12	1.540E-02				
270.52	76.	26.96	0.85	1.399E-02				
295.21	112.	19.49	1.21	1.292E-02				
295.21	112.	19.49	1.21	1.292E-02	295.22	19.200	3.027E-01	PB214
338.70	112.	20.71	1.30	1.134E-02	338.40	12.010	5.499E-01	AC228
351.78	202.	11.55	1.02	1.093E-02				
351.78	202.	11.55	1.02	1.093E-02	351.99	37.100	3.356E-01	PB214
510.90	76.	17.98	1.21	7.588E-03	510.72	22.500	2.368E-01	TL208
583.07	138.	10.56	1.30	6.685E-03	583.14	86.000	1.607E-01	TL208
609.16	121.	11.83	1.24	6.414E-03	609.32	46.090	2.759E-01	BI214
661.62	167.	10.69	1.28	5.937E-03	661.62	84.620	2.249E-01	CS137
727.28	42.	27.90	0.98	5.442E-03	727.17	11.800	4.344E-01	BI212
794.90	18.	41.04	1.50	5.016E-03	795.76	85.400	PBC<MDA	CS134
910.88	94.	13.64	1.41	4.447E-03	911.07	29.000	4.859E-01	AC228
969.19	63.	20.70	1.31	4.211E-03	968.90	17.460	5.741E-01	AC228

1120.42	42.	26.37	1.55	3.711E-03	1120.28	15.040	5.120E-01	BI214
1460.58	468.	4.78	2.10	2.943E-03	1460.75	10.700	1.006E+01	K40

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
416.49	208.41	248.	98.	0.049	83.43	1.097	LU-177	s
477.02	238.65	111.	453.	0.226	17.21	1.122	PB-212	D
483.68	241.98	112.	73.	0.036	70.89	1.124	PB-214	D
540.76	270.52	140.	76.	0.038	80.87	0.849	AC-228	s

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-214	153.79	77.11	668.	236.	0.118	49.63	1.499D
PB-212	153.79	77.11	665.	239.	0.120	49.63	1.499D
TH-234	185.69	93.05	611.	87.	0.043	110.80	1.499s
TH-234	185.63	93.02	599.	93.	0.046	108.79	1.499s
RA-226	371.66	186.00	333.	81.	0.040	101.25	1.499s
PB-212	477.05	238.67	254.	361.	0.180	24.00	1.499
PB-214	477.14	238.72	251.	261.	0.131	31.61	1.499
PB-214	590.31	295.28	158.	105.	0.052	57.59	1.499
AC-228	677.18	338.70	141.	110.	0.055	62.14	1.303s
PB-214	703.81	352.01	101.	165.	0.083	34.23	1.499
TL-208	1021.74	510.90	60.	59.	0.030	53.94	1.206s
TL-208	1166.15	583.07	31.	136.	0.068	31.69	1.305s
BI-214	1218.36	609.16	36.	120.	0.060	35.50	1.244
CS-137	1323.32	661.62	47.	166.	0.083	32.07	1.281
BI-212	1455.06	727.45	33.	29.	0.014	98.44	1.499s
AC-228	1822.12	910.88	24.	92.	0.046	40.92	1.407
AC-228	1938.20	968.89	40.	34.	0.017	91.68	1.616
BI-214	2241.42	1120.42	31.	42.	0.021	79.11	1.549s
K-40	2922.18	1460.58	9.	466.	0.233	14.35	2.103

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	MDA Value pCi/gm	COMMENTS
BE-7		5.5522E-02					
			477.56	5.552E-02	%(	3.003E-01 8.71E-02	G
K-40		1.0056E+01					
			1460.75	1.006E+01	(P	3.685E-01 4.83E-01	G
MN-54		2.8469E-03					
			834.81	2.847E-03	%(P	3.948E-02 1.10E-02	G
CO-57		-5.6604E-03					
			122.07	-5.660E-03	%(	3.998E-02 1.19E-02	G K
			136.43	-4.398E-02	%	3.277E-01 9.76E-02	G
CO-60		5.4693E-03					
			1332.51	5.469E-03	&(P	5.356E-02 1.49E-02	G K
			1173.23	1.944E-02	% P	4.721E-02 1.41E-02	G K
Sr-85		-1.7018E-02					
			514.00	-1.702E-02	%(	4.612E-02 1.38E-02	G
Kr-85		-4.1672E+02					
			513.99	-4.167E+02	%(P	1.068E+03 3.18E+02	G
Y-88		0.0000E+00					
			1836.01	0.000E+00	%(	4.750E-02 1.21E-02	G K
			898.02	1.377E-02	& P	4.049E-02 1.19E-02	G
NB-94		-1.8158E-03					
			871.10	-1.816E-03	%(P	4.645E-02 1.30E-02	G K
			702.50	-4.757E-04	& P	3.328E-02 9.13E-03	G K
Ag-108M		-5.3199E-04					
			722.95	-5.320E-04	&(	2.179E-02 5.55E-03	G K
			614.37	1.197E-02	% P	3.404E-02 1.01E-02	G
			433.93	1.148E-02	&	3.272E-02 9.74E-03	G
CD-109		-6.3439E-02					
			88.04	-6.344E-02	&(P	1.203E+00 3.58E-01	G
SN-113		-3.7454E-04					
			391.71	-3.745E-04	%(	4.351E-02 1.23E-02	G K
			255.04	-3.199E-01	& P	1.610E+00 4.77E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	2.4114E-02						
		427.95	2.411E-02	&(P	9.268E-02	2.71E-02	G K
		600.77	-8.678E-04	% P	1.673E-01	4.59E-02	G
		636.15	-7.849E-03	% P	3.085E-01	8.55E-02	G
		463.51	1.725E-01	% P	2.744E-01	8.47E-02	G
		176.29	7.277E-02	& P	4.848E-01	1.44E-01	G
I-131	-1.3085E-02						
		364.48	-1.309E-02	&(	4.322E-02	1.29E-02	G K
		636.97	9.028E-02	&	4.718E-01	1.36E-01	G
		284.29	-6.736E-02	%	4.792E-01	1.40E-01	G
CS-134	4.8139E-04						
		604.66	4.814E-04	&(P	8.308E-02	2.43E-02	G K
		795.76	2.781E-02	% P	3.615E-02	1.17E-02	G
		569.29	1.783E-02	% P	2.396E-01	6.81E-02	G
		801.84	-2.486E-02	%	4.350E-01	1.21E-01	G
CS-137	2.2486E-01						
		661.62	2.249E-01	(P	4.686E-02	2.42E-02	G
CE-139	9.1448E-03						
		165.85	9.145E-03	%(P	3.692E-02	1.10E-02	G
EU-152	-1.8851E-02						
		121.78	-1.885E-02	%(P	1.208E-01	3.60E-02	G K
		344.30	-4.501E-02	% P	1.322E-01	3.94E-02	G
		1408.08	6.099E-02	% P	1.518E-01	4.50E-02	G
		964.00	8.985E-02	% P	3.647E-01	1.06E-01	G
		1112.07	7.719E-02	& P	4.021E-01	1.15E-01	G
		778.90	1.088E-01	% P	2.306E-01	7.00E-02	G
EU-154	-8.9900E-04						
		123.10	-8.990E-04	%(P	7.611E-02	2.24E-02	G K
		1274.80	4.281E-02	% P	1.240E-01	3.64E-02	G
		723.30	-1.502E-02	& P	1.167E-01	3.11E-02	G
		1004.80	-5.893E-04	% P	3.220E-01	8.99E-02	G
EU-155	4.6384E-02						
		86.45	4.638E-02	%(	1.381E-01	4.16E-02	G K
		105.31	1.320E-03	%	1.621E-01	4.80E-02	G
HG-203	-8.4576E-04						
		279.17	-8.458E-04	&(	3.504E-02	1.02E-02	G K
		72.87	-6.044E-02	% P	9.649E-01	2.87E-01	G
		70.83	-1.364E-02	&	2.007E+00	5.99E-01	G
		82.50	-4.158E-01	%	2.080E+00	6.23E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	1.6069E-01						
		583.14	1.607E-01	@(P	3.399E-02	1.73E-02	G
		510.72	2.368E-01	+ P	1.540E-01	5.41E-02	G
PB-212	3.6558E-01						
		238.63	3.656E-01	(P	7.795E-02	2.97E-02	G K
							Energy duplication
		77.11	5.409E-01	+	2.775E-01	8.95E-02	G
		74.81	3.313E-01	% P	5.811E-01	1.77E-01	G
PB-214	2.8097E-01						
		351.99	2.776E-01	(P	8.303E-02	3.21E-02	G K
		295.22	2.875E-01	(P	1.681E-01	5.61E-02	G
							Energy duplication
		77.11	8.709E-01	+ P	4.551E-01	1.46E-01	G
		241.92	1.545E+00	+ P	4.524E-01	1.63E-01	G
BI-212	3.0557E-01						
		727.17	3.056E-01	@(P	3.116E-01	1.03E-01	G K
		1620.56	0.000E+00	%	1.466E+00	3.69E-01	G
		785.42	4.160E-01	% P	1.598E+00	4.60E-01	G
BI-214	2.7588E-01						
		609.32	2.759E-01	(P	7.067E-02	3.29E-02	G K
		1764.51	1.348E-01	% P	2.254E-01	7.17E-02	G
		1120.28	5.120E-01	+ P	3.491E-01	1.36E-01	G
RA-224	6.9774E-01						
		241.00	6.977E-01	%(P	9.567E-01	2.95E-01	G
RA-226	9.0304E-01						
		185.99	9.030E-01	*(	9.785E-01	3.05E-01	G
AC-228	5.0466E-01						
		911.07	4.859E-01	(P	1.344E-01	6.76E-02	G K
		968.90	3.155E-01	- P	2.975E-01	9.85E-02	G
		338.40	5.499E-01	*(P	2.894E-01	1.16E-01	G
TH-227	-1.1987E-01						
		236.00	-1.199E-01	%(P	3.788E-01	1.14E-01	G K
		256.25	9.769E-02	% P	3.844E-01	1.14E-01	G
PA-234	-6.2587E-03						
		98.44	-6.259E-03	&(	1.586E-01	4.71E-02	G K
		946.00	0.000E+00	%	1.862E-01	5.00E-02	G
		131.28	2.284E-03	%	1.650E-01	4.88E-02	G
		94.67	-7.423E-02	%	2.670E-01	8.03E-02	G
		883.24	6.124E-02	&	2.781E-01	7.92E-02	G
		926.70	-7.304E-02	%	4.028E-01	1.15E-01	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26 1.051E-01 %   3.196E-01 9.46E-02 G

TH-234       8.1875E-01
                           63.29 4.140E-01 &(P 1.836E+00 5.48E-01 G K
                           92.80 1.056E+00  (P 1.331E+00 4.08E-01 G
                           92.38 1.156E+00 &(P 1.572E+00 4.80E-01 G

AM-241      -6.8390E-03
                           59.54-6.839E-03 %(P 2.300E-01 6.80E-02 G
   ( - This peak used in the nuclide activity average.

   * - Peak is too wide, but only one peak in library.
   ! - Peak is part of a multiplet and this area went
       negative during deconvolution.
   ? - Peak is too narrow.
   @ - Peak is too wide at FW25M, but ok at FWHM.
   % - Peak fails sensitivity test.
   $ - Peak identified, but first peak of this nuclide
       failed one or more qualification tests.
   + - Peak activity higher than counting uncertainty range.
   - - Peak activity lower than counting uncertainty range.
   = - Peak outside analysis energy range.
   & - Calculated peak centroid is not close enough to the
       library energy centroid for positive identification.
   P - Peakbackground subtraction
   } - Peak is too close to another for the activity
       to be found directly.

   Nuclide Codes:                      Peak Codes:
   T - Thermal Neutron Activation      G - Gamma Ray
   F - Fast Neutron Activation         X - X-Ray
   I - Fission Product                 P - Positron Decay
   N - Naturally Occurring Isotope     S - Single-Escape
   P - Photon Reaction                 D - Double-Escape
   C - Charged Particle Reaction       K - Key Line
   M - No MDA Calculation              A - Not in Average
   R - Coincidence Corrected           C - Coincidence Peak
   H - Halflife limit exceeded

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
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***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	5.5382E-02	5.5522E-02	2.6121E-01	2.6123E-01	2.996E-01
K-40		1.0056E+01	1.0056E+01	1.4504E+00	1.5577E+00	
MN-54	#A	2.8457E-03	2.8469E-03	3.2885E-02	3.2886E-02	3.946E-02
CO-57	#B	-5.6576E-03	-5.6604E-03	3.5743E-02	3.5745E-02	3.996E-02
CO-60	#B	5.4690E-03	5.4693E-03	4.4651E-02	4.4652E-02	5.355E-02

Sr-85	#A	-1.6983E-02	-1.7018E-02	4.1463E-02	4.1474E-02	4.603E-02
Kr-85	#A	-4.1672E+02	-4.1672E+02	1.0754E+03	1.0756E+03	1.068E+03
Y-88	#B	0.0000E+00	0.0000E+00	3.6178E-02	3.6178E-02	4.744E-02
NB-94	#B	-1.8158E-03	-1.8158E-03	4.8282E-02	4.8282E-02	4.645E-02
Ag-108M	#B	-5.3199E-04	-5.3199E-04	1.6650E-02	1.6650E-02	2.179E-02
CD-109	#A	-6.3420E-02	-6.3439E-02	1.2332E+00	1.2332E+00	1.203E+00
SN-113	#B	-3.7410E-04	-3.7454E-04	3.7006E-02	3.7006E-02	4.346E-02
SB-125	#B	2.4110E-02	2.4114E-02	8.1442E-02	8.1454E-02	9.267E-02
I-131	#B	-1.2868E-02	-1.3085E-02	3.8612E-02	3.8619E-02	4.250E-02
CS-134	#B	4.8130E-04	4.8139E-04	7.2960E-02	7.2960E-02	8.306E-02
CS-137		2.2486E-01	2.2486E-01	7.2507E-02	7.3612E-02	
CE-139	#A	9.1358E-03	9.1448E-03	3.3085E-02	3.3089E-02	3.689E-02
EU-152	#B	-1.8850E-02	-1.8851E-02	1.1836E-01	1.1836E-01	1.208E-01
EU-154	#B	-8.9896E-04	-8.9900E-04	6.2979E-01	6.2979E-01	7.611E-02
EU-155	#B	4.6381E-02	4.6384E-02	1.2492E-01	1.2495E-01	1.381E-01
HG-203	#B	-8.4331E-04	-8.4576E-04	3.0456E-02	3.0456E-02	3.493E-02
TL-208	#	1.6069E-01	1.6069E-01	5.1808E-02	5.2598E-02	
PB-212	#	3.6558E-01	3.6558E-01	8.9246E-02	9.1605E-02	7.795E-02
PB-214	#	2.8097E-01	2.8097E-01	9.5599E-02	9.6908E-02	8.303E-02
BI-212	#A	3.0557E-01	3.0557E-01	3.0788E-01	3.0837E-01	3.116E-01
BI-214		2.7588E-01	2.7588E-01	9.8838E-02	1.0006E-01	
RA-224	#A	6.9774E-01	6.9774E-01	8.8374E-01	8.8462E-01	9.567E-01
RA-226	#A	9.0304E-01	9.0304E-01	9.1435E-01	9.1577E-01	9.785E-01
AC-228		5.0466E-01	5.0466E-01	1.9149E-01	1.9360E-01	
TH-227	#B	-1.1987E-01	-1.1987E-01	3.5096E-01	3.5102E-01	3.788E-01
PA-234	#B	-6.2587E-03	-6.2587E-03	1.4140E-01	1.4140E-01	1.586E-01
TH-234	#B	8.1875E-01	8.1875E-01	9.5012E-01	9.5120E-01	1.836E+00
AM-241	#A	-6.8390E-03	-6.8390E-03	3.6651E-01	3.6651E-01	2.300E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (270.1 to 1999.1 keV) 1.1221827E+01 pCi/gm
Total Decayed Activity (270.1 to 1999.1 keV) 1.1221828E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JJM

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 102F_5SEPT2006_1259.An1

Sample description
FSS-OOL-05-07-015-F

Spectrum Filename: C:\GammaVision\Spectra\102F_5SEPT2006_1259.An1

Acquisition information
Start time: 05-Sep-2006 13:00:29
Live time: 2000
Real time: 2012
Dead time: 0.59 %
Detector ID: 3

Detector system
Det 102 - DSPP-468

Calibration
Filename: D2_1LSa.Clb
DET 102 1 Liter Sand Geometry

Energy Calibration
Created: 15-Jan-2005 03:09:29
Zero offset: 0.220 keV
Gain: 0.500 keV/channel
Quadratic: -6.435E-08 keV/channel^2

Efficiency Calibration
Created: 15-Jan-2005 06:48:10
Type: Polynomial
Uncertainty: 0.497 %
Coefficients: -0.294180 -5.980622 0.744607
-0.096737 0.005214 -0.000120

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.22keV)
Stop channel: 4000 (1999.02keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 1.0550E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.0550E+03) =
9.4787E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	31-Aug-2006 13:35:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	102_150K_28APR05.Pbc 01-May-2005 05:27:47
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 9 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.6459

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
77.14	81.	37.77	1.50	9.541E-03	77.11	10.700	PBC<MDA	PB214
					77.11	17.500	6.223E-01	PB212
77.14	81.	37.77	1.50	9.541E-03	77.11	10.700	1.018E+00	PB214
					77.11	17.500	6.223E-01	PB212
185.88	67.	35.67	1.39	1.627E-02				
185.88	67.	35.67	1.39	1.627E-02	185.99	3.280	PBC<MDA	RA226
239.01	259.	7.61	1.22	1.379E-02	238.63	43.100	5.576E-01	PB212
242.85	31.	41.52	1.22	1.361E-02				
295.77	52.	23.68	1.26	1.143E-02	295.22	19.200	3.011E-01	PB214
339.23	54.	24.66	1.12	1.004E-02	338.40	12.010	5.767E-01	AC228
352.42	76.	16.43	1.35	9.667E-03	351.99	37.100	2.697E-01	PB214
511.52	63.	23.26	2.22	6.695E-03	510.72	22.500	5.357E-01	TL208
					513.99	0.004	2.821E+03	Kr85
					514.00	99.270	1.289E-01	Sr85
583.89	93.	15.00	1.84	5.883E-03	583.14	86.000	2.352E-01	TL208
609.94	70.	20.18	1.24	5.644E-03	609.32	46.090	3.439E-01	BI214
662.62	456.	5.13	1.58	5.222E-03	661.62	84.620	1.319E+00	CS137
728.37	31.	27.11	0.85	4.794E-03	727.17	11.800	6.951E-01	BI212
912.24	64.	14.96	1.51	3.918E-03	911.07	29.000	7.205E-01	AC228
1462.66	171.	7.65	1.92	2.618E-03	1460.75	10.700	7.804E+00	K40

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
371.37	185.88	180.	67.	0.034	107.00	1.386	RA-226	l

485.33	242.82	69.	31.	0.016	124.57	1.218	XE-138	lD

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-214	153.80	77.11	429.	81.	0.041	113.31	1.500D
PB-212	153.80	77.11	429.	81.	0.041	113.31	1.500D
PB-212	477.68	239.02	161.	227.	0.113	31.03	1.500
PB-214	591.32	295.83	104.	54.	0.027	89.21	1.500
AC-228	677.56	338.94	76.	48.	0.024	88.77	1.500s
PB-214	704.61	352.46	61.	76.	0.038	55.40	1.500
TL-208	1022.83	511.52	46.	63.	0.032	69.79	2.216s
TL-208	1167.61	583.89	29.	93.	0.046	45.01	1.840s
BI-214	1219.73	609.94	39.	70.	0.035	60.53	1.241
CS-137	1325.13	662.62	24.	456.	0.228	15.38	1.577
BI-212	1456.69	728.37	13.	31.	0.015	81.33	0.855s
AC-228	1824.54	912.20	8.	47.	0.023	50.59	1.679
K-40	2926.23	1462.66	0.	171.	0.085	22.94	1.918

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	MDA Value pCi/gm	COMMENTS
BE-7		-7.5356E-03					
			477.56	-7.536E-03	&(	6.575E-01 1.85E-01	G
K-40		7.8040E+00					
			1460.75	7.804E+00	(P	3.366E-01 5.97E-01	G
MN-54		9.6952E-03					
			834.81	9.695E-03	%(P	6.155E-02 1.70E-02	G
CO-57		2.5211E-02					
			122.07	2.521E-02	&(	5.524E-02 1.67E-02	G K
			136.43	-3.729E-02	&	4.497E-01 1.32E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CO-60	-6.2480E-03						
		1332.51	-6.248E-03	%(P	8.219E-02	2.18E-02	G K
		1173.23	1.159E-02	%	9.443E-02	2.62E-02	G K
Sr-85	-7.5830E-03						
		514.00	-7.583E-03	%(	7.355E-02	2.10E-02	G
Kr-85	-1.6528E+02						
		513.99	-1.653E+02	%(	1.610E+03	4.60E+02	G
Y-88	-4.0678E-05						
		1836.01	-4.068E-05	%(P	1.043E-01	2.65E-02	G K
		898.02	9.145E-03	% P	7.201E-02	1.96E-02	G
NB-94	1.0514E-02						
		871.10	1.051E-02	&(	5.292E-02	1.47E-02	G K
		702.50	-3.911E-03	&	6.179E-02	1.69E-02	G K
Ag-108M	-9.4203E-03						
		722.95	-9.420E-03	%(	6.611E-02	1.84E-02	G K
		614.37	-2.948E-02	% P	9.071E-02	2.68E-02	G
		433.93	1.507E-02	%	7.010E-02	2.05E-02	G
CD-109	-3.0094E-01						
		88.04	-3.009E-01	&(P	3.124E+00	9.28E-01	G
SN-113	-2.4300E-02						
		391.71	-2.430E-02	%(	8.940E-02	2.63E-02	G K
		255.04	-2.916E-01	%	2.536E+00	7.39E-01	G
SB-125	3.4120E-02						
		427.95	3.412E-02	&(P	1.907E-01	5.48E-02	G K
		600.77	-6.711E-02	% P	3.286E-01	9.38E-02	G
		636.15	1.992E-02	% P	3.199E-01	8.21E-02	G
		463.51	3.473E-01	% P	6.169E-01	1.88E-01	G
		176.29	1.548E-01	% P	8.147E-01	2.40E-01	G
I-131	1.8140E-02						
		364.48	1.814E-02	%(	9.470E-02	2.75E-02	G K
		636.97	-7.402E-02	%	1.014E+00	2.73E-01	G
		284.29	-1.631E-02	&	1.139E+00	3.24E-01	G
CS-134	1.6102E-02						
		604.66	1.610E-02	%(	4.481E-02	1.32E-02	G K
		795.76	4.532E-02	%	6.643E-02	2.13E-02	G
		569.29	1.191E-01	&	2.524E-01	7.68E-02	G
		801.84	-1.445E-01	& P	7.654E-01	2.16E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CS-137	1.3195E+00						
		661.62	1.319E+00	(	7.436E-02	6.77E-02	G
CE-139	3.8875E-03						
		165.85	3.888E-03	&(P	6.656E-02	1.95E-02	G
EU-152	-1.5309E-02						
		121.78	-1.531E-02	&(P	1.353E-01	3.92E-02	G K
		344.30	-5.789E-02	&	2.285E-01	6.75E-02	G
		1408.08	9.773E-03	%	3.225E-01	8.09E-02	G
		964.00	-1.073E-01	% P	5.604E-01	1.58E-01	G
		1112.07	7.168E-02	%	4.916E-01	1.34E-01	G
		778.90	-6.525E-02	& P	5.265E-01	1.46E-01	G
EU-154	1.8196E-02						
		123.10	1.820E-02	%(P	1.240E-01	3.66E-02	G K
		1274.80	-2.501E-02	%	2.705E-01	7.41E-02	G
		723.30	-8.192E-02	% P	3.545E-01	1.01E-01	G
		1004.80	6.023E-03	%	3.671E-01	9.54E-02	G
EU-155	2.6758E-02						
		86.45	2.676E-02	&(P	3.505E-01	1.04E-01	G K
		105.31	1.408E-01	%	2.933E-01	8.90E-02	G
HG-203	-9.3630E-03						
		279.17	-9.363E-03	%(P	7.170E-02	2.09E-02	G K
		72.87	2.787E-02	%	3.147E+00	9.34E-01	G
		70.83	1.483E+00	%	4.067E+00	1.22E+00	G
		82.50	-1.244E+00	%	5.869E+00	1.75E+00	G
TL-208	2.3516E-01						
		583.14	2.352E-01	*(P	7.032E-02	3.55E-02	G
		510.72	5.357E-01	+	2.918E-01	1.25E-01	G
PB-212	5.2651E-01						
		238.63	4.876E-01	(	1.332E-01	5.04E-02	G K
							Energy duplication
		77.11	6.223E-01	*(	7.610E-01	2.35E-01	G
		74.81	5.688E-01	& P	1.573E+00	4.73E-01	G
PB-214	2.8574E-01						
		351.99	2.696E-01	(P	1.393E-01	5.00E-02	G K
		295.22	3.170E-01	(	2.922E-01	9.43E-02	G
							Energy duplication
		77.11	1.018E+00	+	1.245E+00	3.84E-01	G
		241.92	-1.606E-01	%	8.964E-01	2.66E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
BI-212	6.9513E-01						
		727.17	6.951E-01	*(	4.462E-01	1.89E-01	G K
		1620.56	-7.150E-02	% P	2.736E+00	6.52E-01	G
		785.42	-5.396E-01	% P	3.450E+00	9.69E-01	G
BI-214	3.4387E-01						
		609.32	3.439E-01	(	1.567E-01	6.95E-02	G K
		1764.51	-9.133E-02	% P	5.807E-01	1.56E-01	G
		1120.28	1.420E-01	%	5.104E-01	1.47E-01	G
RA-224	-7.9466E-02						
		241.00	-7.947E-02	%(P	1.585E+00	4.61E-01	G
RA-226	9.7627E-01						
		185.99	9.763E-01	%(P	1.650E+00	5.02E-01	G
AC-228	5.1998E-01						
		911.07	5.255E-01	(P	1.794E-01	8.91E-02	G K
		968.90	-4.374E-02	% P	5.690E-01	1.59E-01	G
		338.40	5.066E-01	@(	4.596E-01	1.50E-01	G
TH-227	-8.9502E-02						
		236.00	-8.950E-02	&(P	5.734E-01	1.69E-01	G K
		256.25	1.043E-01	%	7.635E-01	2.23E-01	G
PA-234	-2.0469E-02						
		98.44	-2.047E-02	&(	3.465E-01	1.03E-01	G K
		946.00	3.757E-02	%	2.767E-01	7.45E-02	G
		131.28	8.280E-02	%	2.593E-01	7.77E-02	G
		94.67	-1.189E-01	&	6.596E-01	1.97E-01	G
		883.24	0.000E+00	&	5.456E-01	1.44E-01	G
		926.70	8.532E-02	%	5.096E-01	1.39E-01	G
		569.26	1.380E-01	&	4.066E-01	1.19E-01	G
TH-234	1.4661E+00						
		63.29	1.466E+00	%(P	6.075E+00	1.82E+00	G K
		92.80	1.595E+00	%	3.379E+00	1.02E+00	G
		92.38	1.889E+00	% P	3.986E+00	1.21E+00	G
AM-241	-1.8756E-01						
		59.54	-1.876E-01	&(	8.391E-01	2.50E-01	G

(- This peak used in the nuclide activity average.

* - Peak is too wide, but only one peak in library.
! - Peak is part of a multiplet and this area went negative during deconvolution.

? - Peak is too narrow.
@ - Peak is too wide at FW25M, but ok at FWHM.
% - Peak fails sensitivity test.
$ - Peak identified, but first peak of this nuclide failed one or more qualification tests.
+ - Peak activity higher than counting uncertainty range.
- - Peak activity lower than counting uncertainty range.
= - Peak outside analysis energy range.
& - Calculated peak centroid is not close enough to the library energy centroid for positive identification.
P - Peakbackground subtraction
} - Peak is too close to another for the activity to be found directly.

Nuclide Codes:
T - Thermal Neutron Activation
F - Fast Neutron Activation
I - Fission Product
N - Naturally Occurring Isotope
P - Photon Reaction
C - Charged Particle Reaction
M - No MDA Calculation
R - Coincidence Corrected
H - Halflife limit exceeded

Peak Codes:
G - Gamma Ray
X - X-Ray
P - Positron Decay
S - Single-Escape
D - Double-Escape
K - Key Line
A - Not in Average
C - Coincidence Peak

- -

***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	-7.0642E-03	-7.5356E-03	5.5393E-01	5.5393E-01	6.163E-01
K-40		7.8040E+00	7.8040E+00	1.7919E+00	1.8447E+00	
MN-54	#A	9.5886E-03	9.6952E-03	5.0989E-02	5.0992E-02	6.087E-02
CO-57	#B	2.4891E-02	2.5211E-02	5.0152E-02	5.0171E-02	5.454E-02
CO-60	#B	-6.2369E-03	-6.2480E-03	7.3098E-02	7.3099E-02	8.204E-02
Sr-85	#A	-7.1902E-03	-7.5830E-03	6.3031E-02	6.3033E-02	6.974E-02
Kr-85	#A	-1.6527E+02	-1.6528E+02	1.3800E+03	1.3800E+03	1.610E+03
Y-88	#B	-3.9382E-05	-4.0678E-05	1.0454E-03	1.0454E-03	1.010E-01
NB-94	#B	1.0514E-02	1.0514E-02	4.3955E-02	4.3959E-02	5.292E-02
Ag-108M	#B	-9.4196E-03	-9.4203E-03	5.5248E-02	5.5251E-02	6.611E-02
CD-109	#A	-2.9866E-01	-3.0094E-01	3.6612E+00	3.6612E+00	3.100E+00
SN-113	#B	-2.3582E-02	-2.4300E-02	7.8905E-02	7.8917E-02	8.676E-02
SB-125	#B	3.4004E-02	3.4120E-02	1.6447E-01	1.6448E-01	1.900E-01
I-131	#B	1.1812E-02	1.8140E-02	8.2437E-02	8.2444E-02	6.167E-02
CS-134	#B	1.6028E-02	1.6102E-02	3.9581E-02	3.9591E-02	4.461E-02
CS-137		1.3191E+00	1.3195E+00	2.0290E-01	2.1599E-01	
CE-139	#A	3.7912E-03	3.8875E-03	5.8478E-02	5.8479E-02	6.491E-02
EU-152	#B	-1.5297E-02	-1.5309E-02	1.5895E-01	1.5895E-01	1.352E-01
EU-154	#B	1.8176E-02	1.8196E-02	1.0966E-01	1.0967E-01	1.239E-01
EU-155	#B	2.6707E-02	2.6758E-02	3.1174E-01	3.1175E-01	3.499E-01

HG-203 #B	-8.6949E-03	-9.3630E-03	6.4490E-02	6.4492E-02	6.658E-02

TL-208	2.3516E-01	2.3516E-01	1.0630E-01	1.0712E-01	
PB-212 #	5.2651E-01	5.2651E-01	1.6336E-01	1.6601E-01	1.332E-01
PB-214 #	2.8574E-01	2.8574E-01	1.5025E-01	1.5110E-01	1.393E-01
BI-212 #	6.9513E-01	6.9513E-01	5.6536E-01	5.6670E-01	
BI-214	3.4387E-01	3.4387E-01	2.0815E-01	2.0905E-01	
RA-224 #A	-7.9466E-02	-7.9466E-02	2.8736E+00	2.8736E+00	1.585E+00
RA-226 #A	9.7626E-01	9.7627E-01	1.5065E+00	1.5075E+00	1.650E+00
AC-228 #	5.1998E-01	5.1998E-01	2.6435E-01	2.6596E-01	1.794E-01
TH-227 #B	-8.9502E-02	-8.9502E-02	5.3517E-01	5.3519E-01	5.734E-01
PA-234 #B	-2.0469E-02	-2.0469E-02	3.0770E-01	3.0770E-01	3.465E-01
TH-234 #B	1.4661E+00	1.4661E+00	5.4456E+00	5.4462E+00	6.075E+00
AM-241 #A	-1.8756E-01	-1.8756E-01	7.5040E-01	7.5047E-01	8.391E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (50.2 to 1999.0 keV) 1.0397223E+01 pCi/gm
Total Decayed Activity (50.2 to 1999.0 keV) 1.0397636E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JPK

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 102F_5SEPT2006_1336.An1

Sample description
FSS-OOL-05-07-013-F

Spectrum Filename: C:\GammaVision\Spectra\102F_5SEPT2006_1336.An1

Acquisition information
Start time: 05-Sep-2006 13:37:16
Live time: 2000
Real time: 2002
Dead time: 0.08 %
Detector ID: 1

Detector system
Det 101- DSPE-633

Calibration
Filename: D1_1LSa.Clb
Detector 101 1.0 Liter Marinelli Sand

Energy Calibration
Created: 03-Sep-2004 08:50:48
Zero offset: 0.244 keV
Gain: 0.500 keV/channel
Quadratic: -2.493E-08 keV/channel^2

Efficiency Calibration
Created: 03-Sep-2004 08:52:26
Type: Polynomial
Uncertainty: 0.626 %
Coefficients: -0.321775 -5.816463 0.734234
-0.099357 0.006049 -0.000149

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.23keV)
Stop channel: 4000 (1999.11keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 1.0510E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.0510E+03) =
9.5147E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	31-Aug-2006 13:41:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	101_150K_28APR05.Pbc 01-May-2005 05:24:47
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 9 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.0664

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
77.13	126.	26.72	1.50	1.720E-02	77.11	10.700	8.820E-01	PB214
					77.11	17.500	PBC<MDA	PB212
77.13	130.	26.72	1.50	1.720E-02	77.11	10.700	8.820E-01	PB214
					77.11	17.500	5.552E-01	PB212
129.05	62.	37.04	1.13	2.110E-02				
185.73	55.	32.88	1.00	1.860E-02				
185.73	55.	32.88	1.00	1.860E-02	185.99	3.280	1.160E+00	RA226
238.76	335.	6.53	1.12	1.557E-02	238.63	43.100	6.307E-01	PB212
241.65	40.	38.27	1.12	1.542E-02	241.00	3.900	PBC<MDA	RA224
277.39	34.	40.16	1.50	1.360E-02	279.17	81.500	PBC<MDA	HG203
295.06	91.	17.31	1.12	1.293E-02				
295.06	91.	17.31	1.12	1.293E-02	295.22	19.200	4.635E-01	PB214
338.66	49.	30.37	1.55	1.134E-02	338.40	12.010	4.416E-01	AC228
351.70	100.	16.44	1.05	1.093E-02				
351.70	100.	16.44	1.05	1.093E-02	351.99	37.100	3.113E-01	PB214
511.64	81.	17.65	1.47	7.577E-03	510.72	22.500	4.899E-01	TL208
					513.99	0.004	3.168E+03	Kr85
					514.00	99.270	1.469E-01	Sr85
583.10	109.	12.15	1.26	6.685E-03	583.14	86.000	2.376E-01	TL208
609.52	58.	19.73	1.77	6.411E-03	609.32	46.090	2.453E-01	BI214
661.51	183.	10.39	1.56	5.938E-03	661.62	84.620	4.672E-01	CS137
727.52	18.	33.30	1.50	5.443E-03	727.17	11.800	3.671E-01	BI212
911.34	71.	16.32	1.71	4.445E-03	911.07	29.000	6.913E-01	AC228
968.47	54.	16.97	1.08	4.214E-03				
968.47	54.	16.97	1.08	4.214E-03	968.90	17.460	9.315E-01	AC228
1120.64	24.	33.10	0.67	3.711E-03	1120.28	15.040	5.487E-01	BI214
1460.53	199.	7.29	2.12	2.943E-03	1460.75	10.700	8.038E+00	K40

1764.55	16.	25.00	0.67	2.481E-03	1764.51	15.920	5.065E-01	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
371.12	185.73	136.	55.	0.027	98.64	1.003	U-235	l
477.22	238.76	73.	335.	0.168	19.60	1.122	PB-212	D
483.00	241.65	98.	40.	0.020	114.82	1.124	PB-214	D
1937.35	968.47	37.	27.	0.013	113.01	1.084	SB-124	s

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-214	153.79	77.11	542.	126.	0.063	80.15	1.499D
PB-212	153.79	77.11	538.	130.	0.065	80.15	1.499D
PB-212	477.23	238.77	189.	272.	0.136	27.37	1.499
HG-203	554.51	277.39	74.	34.	0.017	120.48	1.499s
PB-214	590.25	295.25	77.	86.	0.043	52.83	1.499s
AC-228	676.84	338.53	68.	46.	0.023	83.27	1.499s
PB-214	703.77	351.99	57.	77.	0.039	52.23	1.499
TL-208	1023.23	511.64	56.	65.	0.033	52.94	1.472s
TL-208	1166.21	583.10	26.	106.	0.053	36.45	1.261
BI-214	1219.07	609.52	30.	56.	0.028	59.20	1.775s
CS-137	1323.12	661.51	49.	183.	0.091	31.18	1.562
BI-212	1455.19	727.52	11.	18.	0.009	99.91	1.499
AC-228	1822.87	911.26	16.	52.	0.026	50.75	1.578
AC-228	1938.64	969.11	23.	28.	0.014	88.56	1.616s
BI-214	2241.88	1120.64	11.	24.	0.012	99.30	0.671s
K-40	2922.07	1460.53	5.	197.	0.098	21.86	2.120s
BI-214	3530.53	1764.55	0.	16.	0.008	75.00	0.666s

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	Peak MDA Value pCi/gm	COMMENTS
BE-7		2.0536E-01					
			477.56	2.054E-01	%(	4.788E-01 1.44E-01	G
K-40		8.0379E+00					
			1460.75	8.038E+00	@(P	5.438E-01 5.92E-01	G
MN-54		-1.1306E-03					
			834.81	-1.131E-03	&(P	7.259E-02 1.96E-02	G
CO-57		-1.9786E-03					
			122.07	-1.979E-03	%(	6.321E-02 1.86E-02	G K
			136.43	6.244E-03	%	5.146E-01 1.51E-01	G
CO-60		9.4591E-03					
			1332.51	9.459E-03	&(P	7.247E-02 1.96E-02	G K
			1173.23	1.081E-02	% P	7.823E-02 2.16E-02	G K
Sr-85		-2.0681E-02					
			514.00	-2.068E-02	&(	8.625E-02 2.54E-02	G
Kr-85		-4.9939E+02					
			513.99	-4.994E+02	&(P	1.899E+03 5.57E+02	G
Y-88		0.0000E+00					
			1836.01	0.000E+00	%(	4.120E-02 5.59E-03	G K
			898.02	-5.578E-04	% P	9.093E-02 2.49E-02	G
NB-94		-9.0902E-03					
			871.10	-9.090E-03	&(P	6.464E-02 1.80E-02	G K
			702.50	-1.315E-02	% P	6.321E-02 1.81E-02	G K
Ag-108M		-1.3372E-02					
			722.95	-1.337E-02	%(	6.832E-02 1.95E-02	G K
			614.37	-1.100E-02	& P	6.849E-02 1.96E-02	G
			433.93	4.471E-03	&	5.192E-02 1.47E-02	G
CD-109		-4.8033E-01					
			88.04	-4.803E-01	%(P	1.677E+00 5.02E-01	G
SN-113		2.2338E-03					
			391.71	2.234E-03	&(	8.915E-02 2.54E-02	G K
			255.04	-2.895E-01	% P	2.354E+00 6.87E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	-2.5101E-02						
		427.95	-2.510E-02	%(P	1.671E-01	4.78E-02	G K
		600.77	-2.451E-03	% P	3.363E-01	9.29E-02	G
		636.15	-1.186E-01	% P	5.165E-01	1.48E-01	G
		463.51	2.967E-01	% P	5.562E-01	1.69E-01	G
		176.29	-7.020E-03	% P	7.054E-01	2.04E-01	G
I-131	3.5070E-02						
		364.48	3.507E-02	&(	8.350E-02	2.51E-02	G K
		636.97	-2.459E-01	%	1.122E+00	3.21E-01	G
		284.29	-3.418E-02	%	1.161E+00	3.33E-01	G
CS-134	1.2074E-02						
		604.66	1.207E-02	&(P	4.438E-02	1.27E-02	G K
		795.76	4.933E-03	% P	7.148E-02	1.95E-02	G
		569.29	1.130E-02	% P	3.888E-01	1.08E-01	G
		801.84	-1.048E-01	%	6.751E-01	1.89E-01	G
CS-137	4.6723E-01						
		661.62	4.672E-01	(P	9.085E-02	4.88E-02	G
CE-139	2.5147E-04						
		165.85	2.515E-04	%(P	6.432E-02	1.88E-02	G
EU-152	-2.3267E-02						
		121.78	-2.327E-02	%(P	1.641E-01	4.85E-02	G K
		344.30	-3.230E-03	% P	1.629E-01	4.56E-02	G
		1408.08	2.656E-02	% P	3.387E-01	8.90E-02	G
		964.00	-7.840E-02	% P	5.925E-01	1.66E-01	G
		1112.07	5.352E-03	& P	5.214E-01	1.38E-01	G
		778.90	7.865E-02	% P	3.950E-01	1.11E-01	G
EU-154	8.2417E-03						
		123.10	8.242E-03	%(P	1.090E-01	3.20E-02	G K
		1274.80	4.147E-02	% P	1.781E-01	4.98E-02	G
		723.30	-7.388E-02	% P	3.312E-01	9.46E-02	G
		1004.80	-5.915E-02	% P	3.992E-01	1.11E-01	G
EU-155	-5.2241E-03						
		86.45	-5.224E-03	&(	2.050E-01	6.06E-02	G K
		105.31	7.924E-02	&	2.556E-01	7.67E-02	G
HG-203	4.1933E-02						
		279.17	4.193E-02	&(	5.349E-02	1.68E-02	G K
		72.87	-4.214E-01	% P	1.705E+00	5.10E-01	G
		70.83	-6.535E-01	%	3.043E+00	9.11E-01	G
		82.50	4.075E-02	&	3.263E+00	9.63E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	2.3759E-01						
		583.14	2.376E-01	(P	5.898E-02	2.95E-02	G
		510.72	4.899E-01	+ P	2.828E-01	1.08E-01	G
PB-212	5.3094E-01						
		238.63	5.211E-01	(P	1.280E-01	4.86E-02	G K
							Energy duplication
		77.11	5.552E-01	(	4.732E-01	1.48E-01	G
		74.81	5.555E-01	& P	9.438E-01	2.87E-01	G
PB-214	2.4493E-01						
		351.99	2.449E-01	(P	1.206E-01	4.37E-02	G K
		295.22	4.440E-01	+ P	2.254E-01	7.98E-02	G
							Energy duplication
		77.11	8.820E-01	+ P	7.766E-01	2.43E-01	G
		241.92	-7.796E-02	% P	8.683E-01	2.56E-01	G
BI-212	3.6715E-01						
		727.17	3.671E-01	(P	3.668E-01	1.27E-01	G K
		1620.56	3.051E-01	&	2.527E+00	6.65E-01	G
		785.42	-3.040E-02	& P	3.607E+00	9.87E-01	G
BI-214	2.4532E-01						
		609.32	2.453E-01	(P	1.221E-01	4.94E-02	G K
		1764.51	5.065E-01	+ P	2.399E-01	1.30E-01	G
		1120.28	5.487E-01	+ P	4.214E-01	1.85E-01	G
RA-224	3.6277E-01						
		241.00	3.628E-01	%(P	1.570E+00	4.67E-01	G
RA-226	1.0803E+00						
		185.99	1.080E+00	%(	1.540E+00	4.75E-01	G
AC-228	4.9535E-01						
		911.07	5.187E-01	(P	2.155E-01	9.09E-02	G K
		968.90	4.973E-01	(P	4.397E-01	1.51E-01	G
		338.40	4.363E-01	(P	3.889E-01	1.27E-01	G
TH-227	-2.3858E-02						
		236.00	-2.386E-02	%(P	4.632E-01	1.35E-01	G K
		256.25	-6.614E-03	% P	6.474E-01	1.85E-01	G
PA-234	9.3114E-03						
		98.44	9.311E-03	&(	2.373E-01	7.01E-02	G K
		946.00	-2.460E-02	%	3.243E-01	8.82E-02	G
		131.28	-4.747E-02	%	2.860E-01	8.51E-02	G
		94.67	-1.172E-01	%	4.182E-01	1.25E-01	G
		883.24	0.000E+00	%	5.140E-01	1.37E-01	G
		926.70	-4.384E-02	%	5.918E-01	1.61E-01	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26 9.091E-02 %   5.770E-01 1.65E-01 G

TH-234       7.0640E-01
                           63.29 7.064E-01 %(P 2.896E+00 8.63E-01 G K
                           92.80 9.040E-01 % P 2.141E+00 6.45E-01 G
                           92.38-3.004E-01 % P 2.626E+00 7.68E-01 G

AM-241       6.4458E-02
                           59.54 6.446E-02 &(P 3.727E-01 1.11E-01 G
   ( - This peak used in the nuclide activity average.

   * - Peak is too wide, but only one peak in library.
   ! - Peak is part of a multiplet and this area went
       negative during deconvolution.
   ? - Peak is too narrow.
   @ - Peak is too wide at FW25M, but ok at FWHM.
   % - Peak fails sensitivity test.
   $ - Peak identified, but first peak of this nuclide
       failed one or more qualification tests.
   + - Peak activity higher than counting uncertainty range.
   - - Peak activity lower than counting uncertainty range.
   = - Peak outside analysis energy range.
   & - Calculated peak centroid is not close enough to the
       library energy centroid for positive identification.
   P - Peakbackground subtraction
   } - Peak is too close to another for the activity
       to be found directly.

   Nuclide Codes:                      Peak Codes:
   T - Thermal Neutron Activation      G - Gamma Ray
   F - Fast Neutron Activation         X - X-Ray
   I - Fission Product                 P - Positron Decay
   N - Naturally Occurring Isotope     S - Single-Escape
   P - Photon Reaction                 D - Double-Escape
   C - Charged Particle Reaction       K - Key Line
   M - No MDA Calculation              A - Not in Average
   R - Coincidence Corrected           C - Coincidence Peak
   H - Halflife limit exceeded

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
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***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	1.9247E-01	2.0536E-01	4.3211E-01	4.3226E-01	4.488E-01
K-40	#	8.0379E+00	8.0379E+00	1.7772E+00	1.8343E+00	
MN-54	#A	-1.1181E-03	-1.1306E-03	4.9252E-02	4.9252E-02	7.179E-02
CO-57	#B	-1.9534E-03	-1.9786E-03	5.5886E-02	5.5886E-02	6.240E-02
CO-60	#B	9.4421E-03	9.4591E-03	5.8900E-02	5.8902E-02	7.234E-02

Sr-85	#A	-1.9605E-02	-2.0681E-02	7.6302E-02	7.6311E-02	8.177E-02
Kr-85	#A	-4.9937E+02	-4.9939E+02	2.0140E+03	2.0142E+03	1.899E+03
Y-88	#B	0.0000E+00	0.0000E+00	1.6770E-02	1.6773E-02	3.988E-02
NB-94	#B	-9.0902E-03	-9.0902E-03	5.8460E-02	5.8462E-02	6.464E-02
Ag-108M	#B	-1.3371E-02	-1.3372E-02	5.8524E-02	5.8529E-02	6.831E-02
CD-109	#A	-4.7667E-01	-4.8033E-01	1.5599E+00	1.5602E+00	1.664E+00
SN-113	#B	2.1676E-03	2.2338E-03	7.6262E-02	7.6262E-02	8.650E-02
SB-125	#B	-2.5016E-02	-2.5101E-02	1.6255E-01	1.6256E-01	1.666E-01
I-131	#B	2.2795E-02	3.5070E-02	7.5327E-02	7.5353E-02	5.427E-02
CS-134	#B	1.2018E-02	1.2074E-02	3.8061E-02	3.8067E-02	4.417E-02
CS-137		4.6708E-01	4.6723E-01	1.4636E-01	1.4873E-01	
CE-139	#A	2.4521E-04	2.5147E-04	5.6497E-02	5.6497E-02	6.272E-02
EU-152	#B	-2.3250E-02	-2.3267E-02	1.6740E-01	1.6740E-01	1.640E-01
EU-154	#B	8.2325E-03	8.2417E-03	9.5969E-02	9.5970E-02	1.088E-01
EU-155	#B	-5.2142E-03	-5.2241E-03	1.8178E-01	1.8178E-01	2.046E-01
HG-203	#A	3.8928E-02	4.1933E-02	5.0520E-02	5.0576E-02	4.966E-02
TL-208		2.3759E-01	2.3759E-01	8.8541E-02	8.9553E-02	
PB-212	#	5.3094E-01	5.3094E-01	1.4863E-01	1.5163E-01	1.280E-01
PB-214	#	2.4493E-01	2.4493E-01	1.3120E-01	1.3193E-01	1.206E-01
BI-212	#	3.6715E-01	3.6715E-01	3.8037E-01	3.8094E-01	3.668E-01
BI-214		2.4532E-01	2.4532E-01	1.4809E-01	1.4873E-01	
RA-224	#A	3.6277E-01	3.6277E-01	1.4011E+00	1.4012E+00	1.570E+00
RA-226	#A	1.0803E+00	1.0803E+00	1.4238E+00	1.4251E+00	1.540E+00
AC-228	#	4.9535E-01	4.9535E-01	2.2527E-01	2.2700E-01	2.155E-01
TH-227	#B	-2.3858E-02	-2.3858E-02	5.2967E-01	5.2967E-01	4.632E-01
PA-234	#B	9.3114E-03	9.3114E-03	2.1037E-01	2.1037E-01	2.373E-01
TH-234	#B	7.0640E-01	7.0640E-01	2.5880E+00	2.5883E+00	2.896E+00
AM-241	#A	6.4457E-02	6.4458E-02	3.3249E-01	3.3251E-01	3.727E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (294.6 to 1999.1 keV) 8.9878473E+00 pCi/gm
Total Decayed Activity (294.6 to 1999.1 keV) 8.9879951E+00 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JPK

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 102F_5SEPT2006_1351.An1

Sample description
FSS-OOL-05-07-017-F-B

Spectrum Filename: C:\GammaVision\Spectra\102F_5SEPT2006_1351.An1

Acquisition information
Start time: 05-Sep-2006 13:51:32
Live time: 2000
Real time: 2018
Dead time: 0.89 %
Detector ID: 3

Detector system
Det 102 - DSPP-468

Calibration
Filename: D2_1LSa.Clb
DET 102 1 Liter Sand Geometry

Energy Calibration
Created: 15-Jan-2005 03:09:29
Zero offset: 0.220 keV
Gain: 0.500 keV/channel
Quadratic: -6.435E-08 keV/channel^2

Efficiency Calibration
Created: 15-Jan-2005 06:48:10
Type: Polynomial
Uncertainty: 0.497 %
Coefficients: -0.294180 -5.980622 0.744607
-0.096737 0.005214 -0.000120

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.22keV)
Stop channel: 4000 (1999.02keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 1.0740E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.0740E+03) =
9.3110E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	31-Aug-2006 15:57:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	102_150K_28APR05.Pbc 01-May-2005 05:27:47
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 14 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.6392

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
74.86	116.	30.84	1.50	8.847E-03				
74.86	116.	30.84	1.50	8.847E-03	74.81	9.600	PBC<MDA	PB212
77.10	167.	21.66	1.50	9.541E-03	77.11	10.700	2.057E+00	PB214
					77.11	17.500	1.258E+00	PB212
77.10	167.	21.66	1.50	9.541E-03	77.11	10.700	2.057E+00	PB214
					77.11	17.500	1.258E+00	PB212
86.75	81.	32.21	1.11	1.207E-02	86.45	32.740	PBC<MDA	EU155
					88.04	3.790	PBC<MDA	CD109
90.17	63.	40.01	1.11	1.282E-02				
90.17	63.	40.01	1.11	1.282E-02	92.38	2.570	PBC<MDA	TH234
93.54	94.	26.89	1.11	1.348E-02	92.80	3.000	2.951E+00	TH234
129.52	82.	39.31	1.33	1.717E-02				
185.80	67.	41.40	1.06	1.627E-02				
185.80	67.	41.40	1.06	1.627E-02	185.99	3.280	PBC<MDA	RA226
209.90	71.	31.19	1.20	1.516E-02				
239.02	507.	5.24	1.22	1.379E-02	238.63	43.100	1.072E+00	PB212
241.50	84.	25.74	1.22	1.367E-02	241.00	3.900	PBC<MDA	RA224
					241.92	7.470	1.041E+00	PB214
270.85	75.	29.92	1.62	1.240E-02				
295.68	124.	14.39	1.02	1.145E-02	295.22	19.200	7.099E-01	PB214
301.35	52.	31.22	1.30	1.125E-02				
338.80	133.	16.36	1.16	1.005E-02	338.40	12.010	1.387E+00	AC228
352.41	189.	12.16	1.30	9.667E-03	351.99	37.100	6.602E-01	PB214
463.65	31.	34.96	1.07	7.362E-03	463.51	10.000	PBC<MDA	SB125
511.14	100.	17.09	1.33	6.689E-03	510.72	22.500	8.311E-01	TL208
584.14	164.	11.00	1.36	5.880E-03	583.14	86.000	4.076E-01	TL208
610.36	114.	18.26	1.77	5.640E-03	609.32	46.090	5.509E-01	BI214

					614.37	90.393	2.826E-01	Ag108M
662.28	102.	15.67	2.02	5.225E-03	661.62	84.620	2.913E-01	CS137
795.97	26.	34.86	1.60	4.420E-03	795.76	85.400	PBC<MDA	CS134
912.36	122.	15.46	1.13	3.917E-03	911.07	29.000	1.353E+00	AC228
970.34	109.	14.28	1.69	3.713E-03				
1121.48	49.	31.48	1.05	3.283E-03	1120.28	15.040	1.249E+00	BI214
1174.94	79.	15.02	1.63	3.153E-03	1173.23	99.860	3.143E-01	CO60

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
1334.61	77.	16.02	0.97	2.830E-03	1332.51	99.980	3.440E-01	CO60
1462.82	346.	5.75	1.96	2.618E-03	1460.75	10.700	1.553E+01	K40

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
179.92	90.23	289.	63.	0.032	120.03	1.109	PB-214	lD
258.62	129.52	380.	70.	0.035	123.28	1.333	AC-228	sM
371.22	185.80	262.	67.	0.034	124.21	1.064	U-235	l
419.42	209.90	185.	71.	0.036	93.57	1.201	NP-239	M
477.67	239.05	99.	507.	0.253	15.71	1.215	PB-212	D
482.63	241.53	194.	84.	0.042	77.21	1.217	PB-214	D
541.35	270.85	153.	75.	0.037	78.08	1.621	AC-228	sM
602.36	301.35	94.	52.	0.026	93.67	1.300	PB-212	M
927.06	463.65	42.	31.	0.016	104.88	1.074	SB-125	l
1940.89	970.34	29.	111.	0.055	35.33	1.685	AC-228	M
2669.92	1334.61	63.	33.	0.016	116.54	0.967	-	sM

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.
M - Peak is close to a library peak.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-212	149.29	74.86	614.	116.	0.058	92.51	1.500s
PB-214	153.80	77.11	570.	167.	0.083	64.98	1.500D
PB-212	153.80	77.11	570.	167.	0.083	64.98	1.500D
CD-109	173.96	87.19	584.	86.	0.043	122.03	1.500s
TH-234	186.33	93.37	635.	97.	0.048	114.56	1.500s
PB-212	477.59	238.98	295.	447.	0.223	21.64	1.500
RA-224	483.45	241.91	320.	68.	0.034	115.41	1.500
PB-214	591.00	295.67	120.	115.	0.058	49.14	1.500s
AC-228	677.04	338.68	120.	118.	0.059	48.00	1.500
PB-214	704.72	352.52	60.	182.	0.091	28.55	1.500s
TL-208	1022.07	511.14	58.	100.	0.050	51.28	1.326s
TL-208	1168.11	584.14	53.	164.	0.082	32.99	1.363
BI-214	1220.56	610.36	84.	114.	0.057	54.77	1.772s
Ag-108M	1223.96	612.05	130.	-49.	-0.025	107.87	1.499s
CS-137	1324.47	662.28	46.	102.	0.051	47.01	2.016s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
CS-134	1591.96	795.97	28.	26.	0.013	104.57	1.601s
AC-228	1825.45	912.66	35.	84.	0.042	43.97	1.679
BI-214	2243.35	1121.48	42.	49.	0.024	94.45	1.049s
CO-60	2350.24	1174.89	30.	56.	0.028	57.22	1.854
CO-60	2669.78	1334.54	30.	45.	0.022	68.71	1.959
K-40	2926.70	1462.90	10.	329.	0.165	17.02	2.042

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	Peak MDA Value pCi/gm	COMMENTS
BE-7		-3.5882E-02					
			477.56	-3.588E-02	%(	7.450E-01 2.13E-01 G	
K-40		1.4767E+01					
			1460.75	1.477E+01	(P	7.835E-01 8.38E-01 G	
MN-54		-1.3849E-02					
			834.81	-1.385E-02	&(P	9.182E-02 2.61E-02 G	
CO-57		0.0000E+00					
			122.07	0.000E+00	%(	8.740E-02 2.58E-02 G K	
			136.43	1.203E-01	%	6.435E-01 1.92E-01 G	
CO-60		2.1251E-01					
			1332.51	1.994E-01	(P	1.265E-01 4.57E-02 G K	
			1173.23	2.257E-01	(	1.124E-01 4.30E-02 G K	
Sr-85		0.0000E+00					
			514.00	0.000E+00	&(	1.037E-01 2.98E-02 G	
Kr-85		0.0000E+00					
			513.99	0.000E+00	&(	2.272E+03 6.53E+02 G	
Y-88		-1.1752E-02					
			1836.01	-1.175E-02	%(P	9.463E-02 2.52E-02 G K	
			898.02	1.847E-02	& P	1.004E-01 2.86E-02 G	
NB-94		4.5395E-03					
			871.10	4.539E-03	%(	8.778E-02 2.44E-02 G K	
			702.50	2.269E-02	%	8.876E-02 2.60E-02 G K	

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
Ag-108M	0.0000E+00						
		722.95	0.000E+00	%(	1.187E-01	3.36E-02	G K
		614.37	-1.218E-01	+ P	1.387E-01	4.36E-02	G
		433.93	1.705E-02	%	7.632E-02	2.24E-02	G
CD-109	2.3169E+00						
		88.04	2.317E+00	(P	3.125E+00	9.59E-01	G
SN-113	-1.3670E-02						
		391.71	-1.367E-02	%(	1.063E-01	3.09E-02	G K
		255.04	-8.301E-01	%	3.193E+00	9.51E-01	G
SB-125	9.5146E-02						
		427.95	9.515E-02	&(P	1.527E-01	4.73E-02	G K
		600.77	4.701E-02	& P	3.610E-01	1.02E-01	G
		636.15	-1.313E-02	& P	6.783E-01	1.89E-01	G
		463.51	4.506E-01	% P	6.469E-01	2.01E-01	G
		176.29	-2.525E-02	& P	7.996E-01	2.31E-01	G
I-131	-1.2870E-03						
		364.48	-1.287E-03	%(	1.067E-01	3.04E-02	G K
		636.97	0.000E+00	%	1.644E+00	4.59E-01	G
		284.29	-1.427E-01	&	1.549E+00	4.52E-01	G
CS-134	3.6830E-02						
		604.66	-6.700E-03	%(	8.086E-02	2.30E-02	G K
		795.76	8.658E-02	(	9.118E-02	3.02E-02	G
		569.29	-4.018E-03	%	4.977E-01	1.40E-01	G
		801.84	1.294E-01	% P	7.963E-01	2.24E-01	G
CS-137	2.9125E-01						
		661.62	2.913E-01	@(	9.721E-02	4.57E-02	G
CE-139	2.8085E-02						
		165.85	2.809E-02	&(P	7.647E-02	2.30E-02	G
EU-152	1.8476E-02						
		121.78	1.848E-02	%(P	2.217E-01	6.55E-02	G K
		344.30	2.525E-03	%	2.624E-01	7.58E-02	G
		1408.08	4.667E-03	%	3.633E-01	9.27E-02	G
		964.00	-5.320E-03	% P	7.867E-01	2.19E-01	G
		1112.07	-6.091E-02	%	7.933E-01	2.22E-01	G
		778.90	-5.102E-02	% P	5.853E-01	1.63E-01	G
EU-154	2.4470E-02						
		123.10	2.447E-02	&(P	1.624E-01	4.82E-02	G K
		1274.80	1.140E-01	%	2.537E-01	7.66E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
		723.30	1.469E-01	% P	4.646E-01	1.37E-01	G
		1004.80	-9.737E-02	&	5.363E-01	1.53E-01	G
EU-155	2.8657E-01						
		86.45	2.866E-01	%(P	3.986E-01	1.22E-01	G K
		105.31	8.822E-02	%	3.618E-01	1.08E-01	G
HG-203	4.5389E-02						
		279.17	4.539E-02	%(P	7.189E-02	2.21E-02	G K
		72.87	-1.075E+00	%	3.355E+00	1.01E+00	G
		70.83	-2.218E+00	%	6.056E+00	1.83E+00	G
		82.50	-9.805E-02	&	5.031E+00	1.48E+00	G
TL-208	4.0761E-01						
		583.14	4.076E-01	(P	9.093E-02	4.50E-02	G
		510.72	8.311E-01	+	3.178E-01	1.42E-01	G
PB-212	9.4447E-01						
		238.63	9.445E-01	(	1.751E-01	6.81E-02	G K
							Energy duplication
		77.11	1.258E+00	+	8.587E-01	2.72E-01	G
		74.81	1.714E+00	+ P	1.751E+00	5.42E-01	G
PB-214	6.4459E-01						
		351.99	6.379E-01	@(P	1.358E-01	6.08E-02	G K
		295.22	6.575E-01	@(	3.073E-01	1.08E-01	G
							Energy duplication
		77.11	2.057E+00	+	1.404E+00	4.46E-01	G
		241.92	7.725E-01	%	1.068E+00	3.29E-01	G
BI-212	5.1567E-01						
		727.17	5.157E-01	%(	7.689E-01	2.40E-01	G K
		1620.56	-6.405E-02	% P	1.407E+00	1.91E-01	G
		785.42	-6.896E-01	& P	4.747E+00	1.36E+00	G
BI-214	5.5089E-01						
		609.32	5.509E-01	(	2.195E-01	1.01E-01	G K
		1764.51	-8.812E-02	% P	6.298E-01	1.70E-01	G
		1120.28	1.249E+00	+	8.386E-01	3.93E-01	G
RA-224	1.6007E+00						
		241.00	1.601E+00	(P	2.028E+00	6.26E-01	G
RA-226	1.2081E+00						
		185.99	1.208E+00	%(P	1.935E+00	5.90E-01	G
AC-228	1.0196E+00						
		911.07	9.320E-01	(P	3.334E-01	1.37E-01	G K
		968.90	-2.287E-02	% P	6.371E-01	1.79E-01	G
		338.40	1.231E+00	(	5.593E-01	1.97E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TH-227	-1.4478E-01						
		236.00	-1.448E-01	%(P	6.616E-01	1.97E-01	G K
		256.25	-3.710E-03	%	9.109E-01	2.65E-01	G
PA-234	8.6304E-02						
		98.44	8.630E-02	%(	3.748E-01	1.12E-01	G K
		946.00	9.595E-03	%	4.046E-01	1.10E-01	G
		131.28	3.312E-02	&	3.535E-01	1.05E-01	G
		94.67	-2.279E-01	%	7.364E-01	2.22E-01	G
		883.24	1.210E-01	&	6.346E-01	1.80E-01	G
		926.70	-5.390E-03	&	7.192E-01	1.94E-01	G
		569.26	-9.645E-03	%	7.355E-01	2.07E-01	G
TH-234	1.9866E+00						
		63.29	1.172E+00	&(P	7.163E+00	2.14E+00	G K
		92.80	3.045E+00	(	3.779E+00	1.16E+00	G
		92.38	-1.089E-01	& P	4.159E+00	1.23E+00	G
AM-241	-1.3646E-01						
		59.54	-1.365E-01	&(	1.083E+00	3.22E-01	G

(- This peak used in the nuclide activity average.

* - Peak is too wide, but only one peak in library.
! - Peak is part of a multiplet and this area went negative during deconvolution.
? - Peak is too narrow.
@ - Peak is too wide at FW25M, but ok at FWHM.
% - Peak fails sensitivity test.
$ - Peak identified, but first peak of this nuclide failed one or more qualification tests.
\+ - Peak activity higher than counting uncertainty range.
\- - Peak activity lower than counting uncertainty range.
= - Peak outside analysis energy range.
& - Calculated peak centroid is not close enough to the library energy centroid for positive identification.
P - Peakbackground subtraction
} - Peak is too close to another for the activity to be found directly.

Nuclide Codes:	Peak Codes:
T - Thermal Neutron Activation	G - Gamma Ray
F - Fast Neutron Activation	X - X-Ray
I - Fission Product	P - Positron Decay
N - Naturally Occurring Isotope	S - Single-Escape
P - Photon Reaction	D - Double-Escape
C - Charged Particle Reaction	K - Key Line
M - No MDA Calculation	A - Not in Average

R - Coincidence Corrected C - Coincidence Peak
H - Halflife limit exceeded

- -

***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	-3.3665E-02	-3.5882E-02	6.3793E-01	6.3794E-01	6.989E-01
K-40		1.4767E+01	1.4767E+01	2.5147E+00	2.6477E+00	7.835E-01
MN-54	#A	-1.3699E-02	-1.3849E-02	8.5871E-02	8.5875E-02	9.083E-02
CO-57	#B	0.0000E+00	0.0000E+00	7.7394E-02	7.7394E-02	8.631E-02
CO-60		2.1214E-01	2.1251E-01	9.5111E-02	9.5856E-02	1.263E-01
Sr-85	#A	0.0000E+00	0.0000E+00	8.9481E-02	8.9481E-02	9.842E-02
Kr-85	#A	0.0000E+00	0.0000E+00	1.9601E+03	1.9601E+03	2.272E+03
Y-88	#B	-1.1382E-02	-1.1752E-02	7.6003E-02	7.6006E-02	9.166E-02
NB-94	#B	4.5395E-03	4.5395E-03	7.3174E-02	7.3175E-02	8.778E-02
Ag-108M	#B	0.0000E+00	0.0000E+00	1.0093E-01	1.0093E-01	1.187E-01
CD-109	#A	2.2995E+00	2.3169E+00	2.8764E+00	2.8793E+00	3.102E+00
SN-113	#B	-1.3272E-02	-1.3670E-02	9.2603E-02	9.2606E-02	1.032E-01
SB-125	#B	9.4826E-02	9.5146E-02	1.4197E-01	1.4207E-01	1.522E-01
I-131	#B	-8.4264E-04	-1.2870E-03	9.1090E-02	9.1090E-02	6.988E-02
CS-134	#B	3.6664E-02	3.6830E-02	3.8513E-02	3.8569E-02	8.049E-02
CS-137	#	2.9116E-01	2.9125E-01	1.3691E-01	1.3788E-01	
CE-139	#A	2.7398E-02	2.8085E-02	6.9013E-02	6.9031E-02	7.460E-02
EU-152	#B	1.8462E-02	1.8476E-02	1.9647E-01	1.9647E-01	2.215E-01
EU-154	#B	2.4443E-02	2.4470E-02	1.4473E-01	1.4474E-01	1.623E-01
EU-155	#B	2.8603E-01	2.8657E-01	3.6596E-01	3.6630E-01	3.978E-01
HG-203	#B	4.2189E-02	4.5389E-02	6.6421E-02	6.6470E-02	6.682E-02
TL-208		4.0761E-01	4.0761E-01	1.3481E-01	1.3673E-01	
PB-212	#	9.4447E-01	9.4447E-01	2.0435E-01	2.1111E-01	1.751E-01
PB-214	#	6.4459E-01	6.4459E-01	1.8327E-01	1.8680E-01	1.358E-01
BI-212	#B	5.1567E-01	5.1567E-01	7.2071E-01	7.2129E-01	7.689E-01
BI-214		5.5089E-01	5.5089E-01	3.0174E-01	3.0332E-01	
RA-224	#A	1.6007E+00	1.6007E+00	1.8788E+00	1.8809E+00	2.028E+00
RA-226	#A	1.2081E+00	1.2081E+00	1.7711E+00	1.7724E+00	1.935E+00
AC-228		1.0196E+00	1.0196E+00	3.3227E-01	3.3716E-01	3.334E-01
TH-227	#B	-1.4478E-01	-1.4478E-01	6.1011E-01	6.1016E-01	6.616E-01
PA-234	#B	8.6304E-02	8.6304E-02	3.3668E-01	3.3672E-01	3.748E-01
TH-234	#B	1.9866E+00	1.9866E+00	2.2760E+00	2.2786E+00	7.163E+00
AM-241	#A	-1.3646E-01	-1.3646E-01	9.6746E-01	9.6749E-01	1.083E+00

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.

H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (270.7 to 1999.0 keV) 1.7248241E+01 pCi/gm
Total Decayed Activity (270.7 to 1999.0 keV) 1.7248707E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JPK

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 102F_5SEPT2006_1431.An1

Sample description
FSS-OOL-05-07-003-F

Spectrum Filename: C:\GammaVision\Spectra\102F_5SEPT2006_1431.An1

Acquisition information
Start time: 05-Sep-2006 14:31:49
Live time: 2000
Real time: 2018
Dead time: 0.91 %
Detector ID: 3

Detector system
Det 102 - DSPP-468

Calibration
Filename: D2_1LSa.Clb
DET 102 1 Liter Sand Geometry

Energy Calibration
Created: 15-Jan-2005 03:09:29
Zero offset: 0.220 keV
Gain: 0.500 keV/channel
Quadratic: -6.435E-08 keV/channel^2

Efficiency Calibration
Created: 15-Jan-2005 06:48:10
Type: Polynomial
Uncertainty: 0.497 %
Coefficients: -0.294180 -5.980622 0.744607
-0.096737 0.005214 -0.000120

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.22keV)
Stop channel: 4000 (1999.02keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 1.5820E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.5820E+03) =
6.3211E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	31-Aug-2006 14:45:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	102_150K_28APR05.Pbc 01-May-2005 05:27:47
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 16 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.6838

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
74.90	99.	39.57	1.50	8.847E-03				
74.90	99.	39.57	1.50	8.847E-03	74.81	9.600	PBC<MDA	PB212
77.37	128.	31.61	1.50	9.541E-03	77.11	10.700	PBC<MDA	PB214
					77.11	17.500	6.546E-01	PB212
77.37	128.	31.61	1.50	9.541E-03	77.11	10.700	1.071E+00	PB214
					77.11	17.500	6.546E-01	PB212
186.39	68.	38.35	1.40	1.625E-02	185.99	3.280	PBC<MDA	RA226
238.99	464.	5.80	1.22	1.379E-02	238.63	43.100	6.665E-01	PB212
241.70	105.	21.62	1.22	1.367E-02	241.00	3.900	1.654E+00	RA224
					241.92	7.470	8.758E-01	PB214
295.51	122.	20.15	1.55	1.145E-02	295.22	19.200	4.722E-01	PB214
339.02	103.	17.71	1.79	1.004E-02	338.40	12.010	7.310E-01	AC228
352.52	188.	9.54	1.17	9.664E-03	351.99	37.100	4.468E-01	PB214
463.77	56.	31.64	1.05	7.361E-03	463.51	10.000	6.337E-01	SB125
511.21	98.	21.60	1.95	6.689E-03	510.72	22.500	5.557E-01	TL208
583.89	162.	11.40	1.49	5.883E-03	583.14	86.000	2.718E-01	TL208
610.16	137.	12.10	1.60	5.642E-03	609.32	46.090	4.495E-01	BI214
662.74	269.	7.49	1.30	5.221E-03	661.62	84.620	5.186E-01	CS137
728.65	49.	28.94	1.21	4.785E-03	727.17	11.800	7.459E-01	BI212
912.61	125.	14.74	1.60	3.916E-03	911.07	29.000	9.386E-01	AC228
969.33	65.	29.23	1.83	3.716E-03	968.90	17.460	8.575E-01	AC228
1121.68	62.	26.57	1.24	3.283E-03	1120.28	15.040	1.074E+00	BI214
1174.57	50.	20.44	1.85	3.157E-03	1173.23	99.860	1.365E-01	CO60
1334.41	43.	20.92	1.52	2.830E-03	1332.51	99.980	1.308E-01	CO60
1462.89	402.	5.10	1.99	2.617E-03	1460.75	10.700	1.223E+01	K40

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
372.39	186.39	268.	68.	0.034	115.06	1.396	PA-234	l
477.62	238.95	131.	464.	0.232	17.41	1.215	PB-212	D
483.03	241.65	203.	105.	0.052	64.87	1.217	PB-214	D
927.30	463.77	86.	56.	0.028	94.93	1.048	SB-125	l

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-212	149.38	74.90	772.	99.	0.050	118.71	1.500
PB-214	153.80	77.11	754.	128.	0.064	94.84	1.500D
PB-212	153.80	77.11	754.	128.	0.064	94.84	1.500D
PB-212	477.61	238.99	355.	411.	0.206	24.43	1.500s
PB-214	591.15	295.75	170.	106.	0.053	59.84	1.500s
AC-228	677.71	339.02	97.	103.	0.052	53.12	1.793s
PB-214	704.78	352.55	86.	183.	0.091	30.84	1.500
TL-208	1022.20	511.21	100.	98.	0.049	64.79	1.953s
TL-208	1167.61	583.89	50.	161.	0.081	34.20	1.487
BI-214	1220.17	610.16	46.	137.	0.068	36.31	1.601
CS-137	1325.38	662.74	41.	269.	0.134	22.48	1.300
BI-212	1457.25	728.65	46.	49.	0.025	86.83	1.205
AC-228	1825.36	912.61	47.	125.	0.062	44.21	1.601
AC-228	1938.86	969.33	65.	65.	0.033	87.70	1.832
BI-214	2243.75	1121.68	43.	62.	0.031	79.72	1.239s
CO-60	2349.61	1174.57	28.	50.	0.025	61.32	1.854
CO-60	2669.29	1334.29	11.	30.	0.015	72.30	1.959
K-40	2926.73	1462.91	12.	382.	0.191	15.80	2.042

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	MDA Value pCi/gm	COMMENTS
BE-7		-3.8848E-02					
			477.56	-3.885E-02	%(	5.467E-01 1.57E-01	G
K-40		1.1651E+01					
			1460.75	1.165E+01	(P	5.738E-01 6.14E-01	G
MN-54		-6.4150E-04					
			834.81	-6.415E-04	%(P	6.316E-02 1.75E-02	G
CO-57		2.0999E-02					
			122.07	2.100E-02	&(	5.512E-02 1.66E-02	G K
			136.43	-4.716E-02	&	4.367E-01 1.30E-01	G
CO-60		1.1356E-01					
			1332.51	9.062E-02	(P	5.552E-02 2.19E-02	G K
			1173.23	1.365E-01	(	7.392E-02 2.79E-02	G K
Sr-85		-1.6023E-02					
			514.00	-1.602E-02	%(	7.551E-02 2.23E-02	G
Kr-85		-3.5070E+02					
			513.99	-3.507E+02	%(	1.653E+03 4.88E+02	G
Y-88		4.3342E-04					
			1836.01	4.334E-04	&(P	5.327E-02 1.28E-02	G K
			898.02	-9.402E-03	% P	7.580E-02 2.13E-02	G
NB-94		-4.8725E-03					
			871.10	-4.872E-03	%(	5.814E-02 1.62E-02	G K
			702.50	7.971E-03	%	4.581E-02 1.30E-02	G K
Ag-108M		0.0000E+00					
			722.95	0.000E+00	&(	5.016E-02 1.36E-02	G K
			614.37	-6.445E-02	& P	8.637E-02 2.69E-02	G
			433.93	1.704E-02	%	5.781E-02 1.72E-02	G
CD-109		-4.1992E-01					
			88.04	-4.199E-01	&(P	1.995E+00 5.96E-01	G
SN-113		-9.4054E-03					
			391.71	-9.405E-03	%(	7.528E-02 2.19E-02	G K
			255.04	-5.000E-01	%	2.476E+00 7.36E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	-3.4827E-02						
		427.95	-3.483E-02	%(P	1.861E-01	5.43E-02	G K
		600.77	2.482E-02	% P	2.664E-01	7.54E-02	G
		636.15	3.273E-02	% P	3.403E-01	9.41E-02	G
		463.51	3.391E-01	% P	5.308E-01	1.63E-01	G
		176.29	2.447E-02	% P	7.036E-01	2.07E-01	G
I-131	1.3431E-02						
		364.48	1.343E-02	%(	7.289E-02	2.13E-02	G K
		636.97	2.048E-01	&	9.886E-01	2.85E-01	G
		284.29	3.888E-02	&	1.204E+00	3.51E-01	G
CS-134	-8.0147E-03						
		604.66	-8.015E-03	%(	5.372E-02	1.54E-02	G K
		795.76	3.593E-02	%	6.119E-02	1.90E-02	G
		569.29	1.258E-01	%	3.266E-01	9.77E-02	G
		801.84	1.885E-01	% P	4.539E-01	1.36E-01	G
CS-137	5.1865E-01						
		661.62	5.186E-01	(	6.313E-02	3.89E-02	G
CE-139	-1.4640E-02						
		165.85	-1.464E-02	%(P	5.942E-02	1.78E-02	G
EU-152	-3.6127E-02						
		121.78	-3.613E-02	&(P	1.805E-01	5.39E-02	G K
		344.30	6.452E-04	&	1.794E-01	5.18E-02	G
		1408.08	-5.378E-02	%	3.444E-01	9.65E-02	G
		964.00	-1.097E-02	% P	4.285E-01	1.17E-01	G
		1112.07	-6.268E-02	&	5.829E-01	1.65E-01	G
		778.90	-6.365E-02	% P	4.660E-01	1.33E-01	G
EU-154	3.0282E-02						
		123.10	3.028E-02	%(P	1.278E-01	3.82E-02	G K
		1274.80	-5.780E-02	%	2.528E-01	7.33E-02	G
		723.30	-3.499E-02	& P	2.896E-01	8.21E-02	G
		1004.80	-1.417E-02	%	3.165E-01	8.61E-02	G
EU-155	-5.8131E-02						
		86.45	-5.813E-02	%(P	2.975E-01	8.89E-02	G K
		105.31	7.625E-02	%	2.637E-01	7.92E-02	G
HG-203	1.1014E-02						
		279.17	1.101E-02	%(P	5.660E-02	1.67E-02	G K
		72.87	-2.201E-01	%	2.048E+00	6.10E-01	G
		70.83	1.854E-01	&	4.420E+00	1.32E+00	G
		82.50	9.161E-02	&	4.948E+00	1.47E+00	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	2.7183E-01						
		583.14	2.718E-01	(P	6.003E-02	3.11E-02	G
		510.72	5.557E-01	+	2.796E-01	1.20E-01	G
PB-212	6.0887E-01						
		238.63	5.903E-01	@(	1.299E-01	4.81E-02	G K
							Energy duplication
		77.11	6.546E-01	(	6.686E-01	2.07E-01	G
		74.81	9.987E-01	& P	1.329E+00	4.07E-01	G
PB-214	4.2693E-01						
		351.99	4.353E-01	(P	1.095E-01	4.48E-02	G K
		295.22	4.108E-01	*(	2.463E-01	8.19E-02	G
							Energy duplication
		77.11	1.071E+00	+	1.093E+00	3.38E-01	G
		241.92	4.938E-01	%	8.079E-01	2.47E-01	G
BI-212	7.4594E-01						
		727.17	7.459E-01	(	5.161E-01	2.16E-01	G K
		1620.56	3.800E-01	% P	1.906E+00	5.16E-01	G
		785.42	-2.748E-02	% P	3.070E+00	8.54E-01	G
BI-214	4.4945E-01						
		609.32	4.495E-01	(	1.126E-01	5.45E-02	G K
		1764.51	-2.090E-03	% P	1.777E-01	2.41E-02	G
		1120.28	1.074E+00	+	5.749E-01	2.86E-01	G
RA-224	1.0904E+00						
		241.00	1.090E+00	&(P	1.522E+00	4.67E-01	G
RA-226	9.5994E-01						
		185.99	9.599E-01	%(P	1.501E+00	4.58E-01	G
AC-228	8.7175E-01						
		911.07	9.386E-01	(P	2.604E-01	1.39E-01	G K
		968.90	8.575E-01	(P	5.294E-01	2.51E-01	G
		338.40	7.310E-01	(	3.430E-01	1.30E-01	G
TH-227	-9.4056E-02						
		236.00	-9.406E-02	%(P	5.273E-01	1.57E-01	G K
		256.25	1.027E-02	&	7.746E-01	2.27E-01	G
PA-234	5.1226E-02						
		98.44	5.123E-02	%(	2.704E-01	8.09E-02	G K
		946.00	-2.752E-02	&	3.601E-01	1.02E-01	G
		131.28	1.006E-01	%	2.369E-01	7.16E-02	G
		94.67	3.299E-04	%	5.205E-01	1.55E-01	G
		883.24	-3.865E-02	&	5.080E-01	1.42E-01	G
		926.70	4.178E-03	&	4.716E-01	1.27E-01	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26 1.859E-01 %   4.824E-01 1.44E-01 G

TH-234       1.2104E+00
                           63.29 1.210E+00 %(P 5.041E+00 1.51E+00 G K
                           92.80 1.402E+00 &   2.699E+00 8.20E-01 G
                           92.38 1.585E+00 & P 3.205E+00 9.72E-01 G

AM-241      -1.0338E-01
                           59.54-1.034E-01 %(  6.975E-01 2.08E-01 G
   ( - This peak used in the nuclide activity average.

   * - Peak is too wide, but only one peak in library.
   ! - Peak is part of a multiplet and this area went
       negative during deconvolution.
   ? - Peak is too narrow.
   @ - Peak is too wide at FW25M, but ok at FWHM.
   % - Peak fails sensitivity test.
   $ - Peak identified, but first peak of this nuclide
       failed one or more qualification tests.
   + - Peak activity higher than counting uncertainty range.
   - - Peak activity lower than counting uncertainty range.
   = - Peak outside analysis energy range.
   & - Calculated peak centroid is not close enough to the
       library energy centroid for positive identification.
   P - Peakbackground subtraction
   } - Peak is too close to another for the activity
       to be found directly.

   Nuclide Codes:                      Peak Codes:
   T - Thermal Neutron Activation      G - Gamma Ray
   F - Fast Neutron Activation         X - X-Ray
   I - Fission Product                 P - Positron Decay
   N - Naturally Occurring Isotope     S - Single-Escape
   P - Photon Reaction                 D - Double-Escape
   C - Charged Particle Reaction       K - Key Line
   M - No MDA Calculation              A - Not in Average
   R - Coincidence Corrected           C - Coincidence Peak
   H - Halflife limit exceeded

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***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	-3.6411E-02	-3.8848E-02	4.7183E-01	4.7183E-01	5.124E-01
K-40		1.1651E+01	1.1651E+01	1.8420E+00	1.9546E+00	5.738E-01
MN-54	#A	-6.3443E-04	-6.4150E-04	2.7320E-01	2.7320E-01	6.246E-02
CO-57	#B	2.0732E-02	2.0999E-02	4.9850E-02	4.9864E-02	5.441E-02
CO-60		1.1335E-01	1.1356E-01	5.3906E-02	5.4281E-02	5.542E-02

Sr-85	#A	-1.5190E-02	-1.6023E-02	6.6870E-02	6.6876E-02	7.159E-02
Kr-85	#A	-3.5069E+02	-3.5070E+02	1.4636E+03	1.4637E+03	1.653E+03
Y-88	#B	4.1958E-04	4.3342E-04	3.8497E-02	3.8497E-02	5.157E-02
NB-94	#B	-4.8725E-03	-4.8725E-03	4.8717E-02	4.8717E-02	5.814E-02
Ag-108M	#B	0.0000E+00	0.0000E+00	4.0834E-02	4.0834E-02	5.015E-02
CD-109	#A	-4.1672E-01	-4.1992E-01	2.0353E+00	2.0354E+00	1.980E+00
SN-113	#B	-9.1269E-03	-9.4054E-03	6.5677E-02	6.5679E-02	7.306E-02
SB-125	#B	-3.4708E-02	-3.4827E-02	2.0080E-01	2.0081E-01	1.854E-01
I-131	#B	8.7345E-03	1.3431E-02	6.3755E-02	6.3759E-02	4.740E-02
CS-134	#B	-7.9779E-03	-8.0147E-03	4.6319E-02	4.6321E-02	5.348E-02
CS-137		5.1849E-01	5.1865E-01	1.1661E-01	1.2019E-01	
CE-139	#A	-1.4276E-02	-1.4640E-02	5.5351E-02	5.5357E-02	5.794E-02
EU-152	#B	-3.6100E-02	-3.6127E-02	1.7583E-01	1.7584E-01	1.804E-01
EU-154	#B	3.0248E-02	3.0282E-02	1.1471E-01	1.1472E-01	1.276E-01
EU-155	#B	-5.8020E-02	-5.8131E-02	3.5582E-01	3.5583E-01	2.969E-01
HG-203	#B	1.0225E-02	1.1014E-02	5.0152E-02	5.0156E-02	5.255E-02
TL-208		2.7183E-01	2.7183E-01	9.3208E-02	9.4448E-02	
PB-212	#	6.0887E-01	6.0887E-01	1.4875E-01	1.5262E-01	1.299E-01
PB-214	#	4.2693E-01	4.2693E-01	1.3196E-01	1.3412E-01	1.095E-01
BI-212		7.4594E-01	7.4594E-01	6.4771E-01	6.4906E-01	
BI-214		4.4945E-01	4.4945E-01	1.6321E-01	1.6515E-01	
RA-224	#A	1.0904E+00	1.0904E+00	1.4020E+00	1.4033E+00	1.522E+00
RA-226	#A	9.5994E-01	9.5994E-01	1.3741E+00	1.3752E+00	1.501E+00
AC-228		8.7175E-01	8.7175E-01	3.2466E-01	3.2833E-01	
TH-227	#B	-9.4056E-02	-9.4056E-02	4.8718E-01	4.8721E-01	5.273E-01
PA-234	#B	5.1226E-02	5.1226E-02	2.4263E-01	2.4265E-01	2.704E-01
TH-234	#B	1.2104E+00	1.2104E+00	4.5325E+00	4.5330E+00	5.041E+00
AM-241	#A	-1.0338E-01	-1.0338E-01	6.2332E-01	6.2335E-01	6.974E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (295.2 to 1999.0 keV) 1.4621977E+01 pCi/gm
Total Decayed Activity (295.2 to 1999.0 keV) 1.4622344E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JPK

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 102F_5SEPT2006_1547.An1

Sample description
FSS-OOL-05-07-001-F

Spectrum Filename: C:\GammaVision\Spectra\102F_5SEPT2006_1547.An1

Acquisition information
Start time: 05-Sep-2006 15:47:58
Live time: 2000
Real time: 2014
Dead time: 0.68 %
Detector ID: 3

Detector system
Det 102 - DSPP-468

Calibration
Filename: D2_1LSa.Clb
DET 102 1 Liter Sand Geometry

Energy Calibration
Created: 15-Jan-2005 03:09:29
Zero offset: 0.220 keV
Gain: 0.500 keV/channel
Quadratic: -6.435E-08 keV/channel^2

Efficiency Calibration
Created: 15-Jan-2005 06:48:10
Type: Polynomial
Uncertainty: 0.497 %
Coefficients: -0.294180 -5.980622 0.744607
-0.096737 0.005214 -0.000120

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.22keV)
Stop channel: 4000 (1999.02keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 9.6300E+02
Activity scaling factor: 1.0000E+06/(1.0000E+00* 9.6300E+02) =
1.0384E+03
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	31-Aug-2006 14:26:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	102_150K_28APR05.Pbc 01-May-2005 05:27:47
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 10 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.6900

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
77.16	105.	31.03	1.50	9.541E-03	77.11	10.700	1.446E+00	PB214
					77.11	17.500	8.839E-01	PB212
77.16	105.	31.03	1.50	9.541E-03	77.11	10.700	1.446E+00	PB214
					77.11	17.500	8.839E-01	PB212
186.84	91.	25.45	1.06	1.623E-02	185.99	3.280	2.287E+00	RA226
239.44	444.	7.48	1.29	1.377E-02	238.63	43.100	1.047E+00	PB212
295.82	70.	22.59	1.58	1.144E-02	295.22	19.200	4.462E-01	PB214
338.99	77.	20.51	0.84	1.004E-02	338.40	12.010	8.943E-01	AC228
352.30	169.	11.40	0.98	9.670E-03	351.99	37.100	6.585E-01	PB214
511.50	46.	23.07	1.50	6.695E-03	510.72	22.500	4.263E-01	TL208
583.87	114.	13.28	0.85	5.883E-03	583.14	86.000	3.133E-01	TL208
610.08	104.	13.96	1.39	5.643E-03	609.32	46.090	5.594E-01	BI214
662.93	108.	13.29	1.53	5.220E-03	661.62	84.620	3.432E-01	CS137
728.06	28.	37.48	0.68	4.789E-03	727.17	11.800	6.822E-01	BI212
912.42	60.	15.94	1.36	3.917E-03	911.07	29.000	7.436E-01	AC228
970.37	50.	21.18	1.70	3.713E-03				
1463.03	288.	5.89	2.14	2.617E-03	1460.75	10.700	1.440E+01	K40

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
478.51	239.44	521.	101.	0.051	100.28	1.289	PB-212	s
1456.07	728.06	22.	28.	0.014	92.01	0.684	J-132	s
1940.94	970.37	11.	57.	0.029	46.36	1.695	AC-228	

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-214	153.80	77.11	480.	105.	0.053	93.08	1.500D
PB-212	153.80	77.11	480.	105.	0.053	93.08	1.500D
RA-226	372.23	186.31	208.	55.	0.028	108.58	1.500s
PB-212	477.67	239.02	211.	300.	0.150	26.86	1.500
PB-214	591.42	295.88	81.	64.	0.032	70.18	1.500s
AC-228	677.71	339.02	73.	66.	0.033	66.48	1.500
PB-214	704.62	352.47	55.	136.	0.068	34.43	1.500s
TL-208	1022.78	511.50	33.	46.	0.023	69.22	1.499s
TL-208	1168.16	584.16	29.	84.	0.042	42.52	1.499s
BI-214	1220.01	610.08	32.	104.	0.052	41.89	1.393
CS-137	1325.75	662.93	31.	108.	0.054	39.87	1.529
AC-228	1825.30	912.58	11.	56.	0.028	47.26	1.679
K-40	2927.01	1463.05	13.	262.	0.131	19.41	2.042

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

Nuclide Name	Nuclide Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	MDA Value pCi/gm	COMMENTS
BE-7		1.9861E-01					
			477.56	1.986E-01	&(	5.440E-01 1.61E-01 G	
K-40		1.3105E+01					
			1460.75	1.311E+01	(P	9.714E-01 8.48E-01 G	
MN-54		-2.5132E-03					
			834.81	-2.513E-03	%(P	8.158E-02 2.20E-02 G	
CO-57		1.4290E-03					
			122.07	1.429E-03	%(	7.026E-02 2.05E-02 G K	
			136.43	8.561E-02	%	5.645E-01 1.67E-01 G	

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CO-60	2.0602E-02						
		1332.51	2.060E-02	&(P	1.001E-01	2.81E-02	G K
		1173.23	-1.969E-02	&	1.127E-01	3.20E-02	G K
Sr-85	-2.9329E-02						
		514.00	-2.933E-02	%(	9.860E-02	2.92E-02	G
Kr-85	-6.4146E+02						
		513.99	-6.415E+02	%(	2.156E+03	6.39E+02	G
Y-88	-4.4587E-05						
		1836.01	-4.459E-05	%(P	5.007E-02	6.79E-03	G K
		898.02	-1.049E-02	& P	9.392E-02	2.56E-02	G
NB-94	7.5733E-03						
		871.10	7.573E-03	%(	7.203E-02	1.97E-02	G K
		702.50	4.861E-03	%	7.217E-02	1.99E-02	G K
Ag-108M	-1.0441E-02						
		722.95	-1.044E-02	%(	8.225E-02	2.31E-02	G K
		614.37	-8.055E-03	% P	9.217E-02	2.60E-02	G
		433.93	1.930E-02	%	5.930E-02	1.75E-02	G
CD-109	-2.3789E-01						
		88.04	-2.379E-01	&(P	3.399E+00	1.01E+00	G
SN-113	-8.9829E-03						
		391.71	-8.983E-03	&(	9.725E-02	2.78E-02	G K
		255.04	5.443E-01	%	2.587E+00	7.60E-01	G
SB-125	2.5470E-02						
		427.95	2.547E-02	%(P	1.802E-01	5.09E-02	G K
		600.77	8.224E-02	% P	3.529E-01	1.02E-01	G
		636.15	5.649E-02	& P	5.495E-01	1.52E-01	G
		463.51	3.025E-01	% P	6.409E-01	1.93E-01	G
		176.29	-3.649E-02	% P	7.081E-01	2.02E-01	G
I-131	2.6083E-02						
		364.48	2.608E-02	%(	1.045E-01	3.06E-02	G K
		636.97	0.000E+00	&	1.309E+00	3.52E-01	G
		284.29	1.379E-01	&	1.448E+00	4.20E-01	G
CS-134	0.0000E+00						
		604.66	0.000E+00	&(	1.024E-01	2.90E-02	G K
		795.76	1.879E-02	%	6.014E-02	1.73E-02	G
		569.29	0.000E+00	&	6.123E-01	1.73E-01	G
		801.84	1.024E-01	% P	8.600E-01	2.39E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CS-137	3.4322E-01						
		661.62	3.432E-01	(	9.063E-02	4.57E-02	G
CE-139	6.6284E-04						
		165.85	6.628E-04	%(P	7.312E-02	2.13E-02	G
EU-152	8.7791E-03						
		121.78	8.779E-03	%(P	2.009E-01	5.88E-02	G K
		344.30	4.521E-02	%	1.968E-01	5.75E-02	G
		1408.08	3.027E-03	%	4.286E-01	1.10E-01	G
		964.00	3.377E-01	% P	5.510E-01	1.73E-01	G
		1112.07	0.000E+00	&	7.533E-01	2.03E-01	G
		778.90	-1.190E-02	% P	5.783E-01	1.56E-01	G
EU-154	2.4334E-03						
		123.10	2.433E-03	&(P	1.474E-01	4.31E-02	G K
		1274.80	-2.393E-02	&	3.251E-01	8.94E-02	G
		723.30	-1.617E-03	& P	3.509E-01	9.39E-02	G
		1004.80	7.431E-02	%	4.331E-01	1.20E-01	G
EU-155	-1.4506E-02						
		86.45	-1.451E-02	&(P	3.787E-01	1.12E-01	G K
		105.31	-4.942E-03	%	3.848E-01	1.13E-01	G
HG-203	1.4945E-03						
		279.17	1.495E-03	%(P	8.049E-02	2.32E-02	G K
		72.87	-4.835E-01	&	3.298E+00	9.84E-01	G
		70.83	0.000E+00	%	7.155E+00	2.12E+00	G
		82.50	-1.138E+00	%	5.750E+00	1.72E+00	G
TL-208	2.3144E-01						
		583.14	2.314E-01	(P	7.730E-02	3.30E-02	G
		510.72	4.263E-01	+	2.741E-01	9.84E-02	G
PB-212	7.5873E-01						
		238.63	7.079E-01	(	1.660E-01	6.34E-02	G K
							Energy duplication
		77.11	8.839E-01	@(	8.807E-01	2.74E-01	G
		74.81	1.005E+00	& P	1.813E+00	5.51E-01	G
PB-214	5.3176E-01						
		351.99	5.318E-01	@(P	1.454E-01	6.12E-02	G K
		295.22	4.099E-01	-	2.846E-01	9.59E-02	G
							Energy duplication
		77.11	1.446E+00	+	1.440E+00	4.49E-01	G
		241.92	5.005E-01	%	1.026E+00	3.11E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
BI-212	-5.4768E-03						
		727.17	-5.477E-03	%(	5.966E-01	1.61E-01	G K
		1620.56	-7.143E-02	% P	4.662E+00	1.23E+00	G
		785.42	-5.580E-03	% P	4.149E+00	1.13E+00	G
BI-214	5.5942E-01						
		609.32	5.594E-01	(	1.571E-01	7.82E-02	G K
		1764.51	-1.384E-02	% P	7.341E-01	1.91E-01	G
		1120.28	-1.476E-01	%	7.649E-01	2.19E-01	G
RA-224	1.0868E+00						
		241.00	1.087E+00	&(P	1.937E+00	5.90E-01	G
RA-226	1.4542E+00						
		185.99	1.454E+00	*(P	1.841E+00	5.69E-01	G
AC-228	7.0881E-01						
		911.07	6.867E-01	(P	2.245E-01	1.09E-01	G K
		968.90	-1.689E-01	% P	7.042E-01	2.05E-01	G
		338.40	7.622E-01	(	4.937E-01	1.69E-01	G
TH-227	-7.0420E-03						
		236.00	-7.042E-03	&(P	4.796E-01	1.38E-01	G K
		256.25	1.071E-01	%	7.894E-01	2.30E-01	G
PA-234	-4.6453E-03						
		98.44	-4.645E-03	%(	3.547E-01	1.05E-01	G K
		946.00	3.977E-02	%	3.648E-01	9.93E-02	G
		131.28	-6.729E-02	%	3.273E-01	9.74E-02	G
		94.67	2.856E-01	&	6.113E-01	1.85E-01	G
		883.24	-5.439E-02	%	5.843E-01	1.59E-01	G
		926.70	-5.655E-02	%	7.086E-01	1.93E-01	G
		569.26	0.000E+00	&	9.042E-01	2.56E-01	G
TH-234	1.8215E+00						
		63.29	1.822E+00	%(P	7.342E+00	2.20E+00	G K
		92.80	1.514E+00	%	3.614E+00	1.09E+00	G
		92.38	4.548E-01	% P	3.861E+00	1.15E+00	G
AM-241	-1.2135E-01						
		59.54	-1.214E-01	%(	1.133E+00	3.37E-01	G

(- This peak used in the nuclide activity average.

* - Peak is too wide, but only one peak in library.
! - Peak is part of a multiplet and this area went negative during deconvolution.

? - Peak is too narrow.
@ - Peak is too wide at FW25M, but ok at FWHM.
% - Peak fails sensitivity test.
$ - Peak identified, but first peak of this nuclide failed one or more qualification tests.
+ - Peak activity higher than counting uncertainty range.
- - Peak activity lower than counting uncertainty range.
= - Peak outside analysis energy range.
& - Calculated peak centroid is not close enough to the library energy centroid for positive identification.
P - Peakbackground subtraction
} - Peak is too close to another for the activity to be found directly.

Nuclide Codes:
T - Thermal Neutron Activation
F - Fast Neutron Activation
I - Fission Product
N - Naturally Occurring Isotope
P - Photon Reaction
C - Charged Particle Reaction
M - No MDA Calculation
R - Coincidence Corrected
H - Halflife limit exceeded

Peak Codes:
G - Gamma Ray
X - X-Ray
P - Positron Decay
S - Single-Escape
D - Double-Escape
K - Key Line
A - Not in Average
C - Coincidence Peak

- -

***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	1.8599E-01	1.9861E-01	4.8421E-01	4.8434E-01	5.094E-01
K-40		1.3105E+01	1.3105E+01	2.5452E+00	2.6493E+00	9.714E-01
MN-54	#A	-2.4851E-03	-2.5132E-03	1.1865E-01	1.1865E-01	8.067E-02
CO-57	#B	1.4106E-03	1.4290E-03	6.1632E-02	6.1632E-02	6.935E-02
CO-60	#B	2.0565E-02	2.0602E-02	8.4435E-02	8.4442E-02	9.993E-02
Sr-85	#A	-2.7785E-02	-2.9329E-02	8.7676E-02	8.7691E-02	9.341E-02
Kr-85	#A	-6.4144E+02	-6.4146E+02	1.9176E+03	1.9179E+03	2.156E+03
Y-88	#B	-4.3145E-05	-4.4587E-05	2.6752E-04	2.6753E-04	4.845E-02
NB-94	#B	7.5733E-03	7.5733E-03	5.9105E-02	5.9106E-02	7.203E-02
Ag-108M	#B	-1.0440E-02	-1.0441E-02	6.9166E-02	6.9169E-02	8.224E-02
CD-109	#A	-2.3606E-01	-2.3789E-01	4.4315E+00	4.4315E+00	3.373E+00
SN-113	#B	-8.7135E-03	-8.9829E-03	8.3414E-02	8.3415E-02	9.433E-02
SB-125	#B	2.5382E-02	2.5470E-02	1.5283E-01	1.5284E-01	1.796E-01
I-131	#B	1.6866E-02	2.6083E-02	9.1783E-02	9.1794E-02	6.755E-02
CS-134	#B	0.0000E+00	0.0000E+00	8.6966E-02	8.6966E-02	1.019E-01
CS-137		3.4311E-01	3.4322E-01	1.3684E-01	1.3819E-01	
CE-139	#A	6.4616E-04	6.6284E-04	6.3978E-02	6.3978E-02	7.128E-02
EU-152	#B	8.7725E-03	8.7791E-03	1.7627E-01	1.7627E-01	2.007E-01
EU-154	#B	2.4306E-03	2.4334E-03	1.2929E-01	1.2929E-01	1.473E-01
EU-155	#B	-1.4478E-02	-1.4506E-02	1.1310E+01	1.1310E+01	3.780E-01

HG-203 #B	1.3862E-03	1.4945E-03	6.9624E-02	6.9624E-02	7.466E-02

TL-208	#	2.3144E-01	2.3144E-01	9.8895E-02	9.9744E-02	7.730E-02
PB-212	#	7.5873E-01	7.5873E-01	2.0378E-01	2.0818E-01	1.660E-01
PB-214	#	5.3176E-01	5.3176E-01	1.8359E-01	1.8600E-01	1.454E-01
BI-212	#B	-5.4768E-03	-5.4768E-03	4.8324E-01	4.8324E-01	5.966E-01
BI-214		5.5942E-01	5.5942E-01	2.3433E-01	2.3643E-01	
RA-224	#A	1.0868E+00	1.0868E+00	1.7711E+00	1.7721E+00	1.937E+00
RA-226	#A	1.4542E+00	1.4542E+00	1.7063E+00	1.7082E+00	1.841E+00
AC-228	#	7.0881E-01	7.0881E-01	2.8949E-01	2.9221E-01	2.245E-01
TH-227	#B	-7.0420E-03	-7.0420E-03	8.8979E-01	8.8979E-01	4.796E-01
PA-234	#B	-4.6453E-03	-4.6453E-03	3.1361E-01	3.1361E-01	3.547E-01
TH-234	#B	1.8215E+00	1.8215E+00	6.5929E+00	6.5937E+00	7.342E+00
AM-241	#A	-1.2135E-01	-1.2135E-01	1.0097E+00	1.0098E+00	1.133E+00

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (50.2 to 1999.0 keV) 1.4007633E+01 pCi/gm
Total Decayed Activity (50.2 to 1999.0 keV) 1.4007743E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JPK

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 103F_5SEP2006_1244.An1

Sample description
FSS-OOL-05-07-014-F

Spectrum Filename: C:\GammaVision\Spectra\103F_5SEP2006_1244.An1

Acquisition information
Start time: 05-Sep-2006 12:44:30
Live time: 2000
Real time: 2001
Dead time: 0.06 %
Detector ID: 4

Detector system
Det 103 - DSPE-471

Calibration
Filename: D3_1LSa.Clb
Detector_103 1.0 Liter Sand Geometry

Energy Calibration
Created: 08-Aug-2005 11:09:41
Zero offset: 0.409 keV
Gain: 0.500 keV/channel
Quadratic: 1.092E-08 keV/channel^2

Efficiency Calibration
Created: 08-Aug-2005 11:11:25
Type: Polynomial
Uncertainty: 0.993 %
Coefficients: -0.264059 -5.138468 0.638383
-0.089199 0.005011 -0.000129

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.41keV)
Stop channel: 4000 (2000.67keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 8.2100E+02
Activity scaling factor: 1.0000E+06/(1.0000E+00* 8.2100E+02) =
1.2180E+03
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	31-Aug-2006 13:52:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	103_150K_05AUG05.Pbc 08-Aug-2005 12:54:15
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 17 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.1333

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
74.88	53.	34.25	0.99	9.100E-03	74.81	9.600	PBC<MDA	PB212
77.18	118.	17.90	0.99	1.016E-02	77.11	17.500	1.066E+00	PB212
					77.11	10.700	1.744E+00	PB214
93.10	61.	39.19	1.50	1.631E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
93.11	62.	37.55	1.50	1.645E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
185.95	112.	23.26	1.11	2.567E-02	185.99	3.280	1.933E+00	RA226
209.86	56.	37.08	0.82	2.469E-02				
238.74	598.	4.79	1.09	2.320E-02	238.63	43.100	9.640E-01	PB212
241.78	93.	19.78	1.09	2.303E-02	241.00	3.900	1.703E+00	RA224
					241.92	7.470	8.910E-01	PB214
295.22	187.	12.94	0.96	2.025E-02	295.22	19.200	7.750E-01	PB214
338.64	88.	19.78	1.34	1.829E-02	338.40	12.010	6.493E-01	AC228
351.96	263.	9.05	1.08	1.775E-02	351.99	37.100	6.427E-01	PB214
463.11	46.	35.10	1.40	1.426E-02				
463.11	46.	35.10	1.40	1.426E-02	463.51	10.000	5.196E-01	SB125
510.97	154.	12.83	1.46	1.317E-02	510.72	22.500	7.055E-01	TL208
583.29	190.	9.20	1.11	1.184E-02	583.14	86.000	2.992E-01	TL208
609.35	240.	8.50	1.28	1.144E-02	609.32	46.090	7.291E-01	BI214
661.66	250.	9.26	1.48	1.072E-02	661.62	84.620	4.519E-01	CS137
727.06	62.	19.78	2.26	9.965E-03	727.17	11.800	8.694E-01	BI212
795.42	24.	31.69	1.61	9.304E-03				
795.42	24.	31.69	1.61	9.304E-03	795.76	85.400	4.895E-02	CS134
911.51	139.	10.61	1.70	8.398E-03	911.07	29.000	9.150E-01	AC228
968.15	104.	14.43	0.99	8.030E-03	968.90	17.460	1.215E+00	AC228
1120.73	59.	15.97	2.23	7.212E-03	1120.28	15.040	8.909E-01	BI214

1461.00	521.	4.43	2.24	5.931E-03	1460.75	10.700	1.303E+01	K40
1764.89	26.	19.61	1.81	5.141E-03	1764.51	15.920	4.570E-01	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide
418.88	209.86	169.	56.	0.028	111.23	0.822	NP-239

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-212	148.79	74.81	165.	50.	0.025	109.68	0.993D
PB-212	153.39	77.11	166.	90.	0.045	65.62	0.995A
RA-226	371.06	185.95	248.	99.	0.049	69.78	1.106s
PB-212	476.68	238.76	366.	529.	0.264	20.69	1.041
RA-224	482.64	241.74	349.	93.	0.046	91.07	1.500
PB-214	589.58	295.22	152.	183.	0.092	38.83	0.962
AC-228	676.43	338.64	98.	87.	0.043	59.34	1.336
PB-214	703.07	351.96	118.	257.	0.129	27.15	1.078
SB-125	925.61	463.24	70.	32.	0.016	118.28	1.500
TL-208	1021.05	510.97	98.	127.	0.064	38.50	1.459s
TL-208	1165.68	583.29	47.	185.	0.093	27.61	1.112
BI-214	1217.80	609.35	61.	234.	0.117	25.50	1.278
CS-137	1322.41	661.66	77.	249.	0.125	27.78	1.482s
BI-212	1453.18	727.06	33.	62.	0.031	59.34	2.259s
CS-134	1589.36	795.15	17.	26.	0.013	88.38	1.500
AC-228	1822.06	911.51	29.	135.	0.068	31.83	1.699
AC-228	1935.32	968.15	33.	103.	0.052	43.29	0.989s
BI-214	2240.44	1120.73	13.	59.	0.029	47.91	2.232s
K-40	2920.87	1461.00	23.	502.	0.251	13.28	2.244s
BI-214	3528.38	1764.81	7.	15.	0.008	82.50	2.033

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	MDA Value pCi/gm	COMMENTS
BE-7		8.1703E-02					
			477.56	8.170E-02	%(	5.205E-01 1.51E-01	G
K-40		1.3030E+01					
			1460.75	1.303E+01	(P	6.437E-01 5.98E-01	G
MN-54		4.0301E-03					
			834.81	4.030E-03	%(P	4.838E-02 1.34E-02	G
CO-57		4.7785E-05					
			122.07	4.779E-05	&(P	7.693E-02 2.27E-02	G K
			136.43	-8.393E-02	%	5.437E-01 1.61E-01	G
CO-60		3.0475E-04					
			1332.51	3.047E-04	%(P	5.749E-02 1.47E-02	G K
			1173.23	7.462E-03	% P	5.962E-02 1.64E-02	G K
Sr-85		-1.6160E-02					
			514.00	-1.616E-02	%(	7.640E-02 2.26E-02	G
Kr-85		-3.5374E+02					
			513.99	-3.537E+02	%(	1.673E+03 4.94E+02	G
Y-88		-7.7102E-03					
			1836.01	-7.710E-03	%(P	5.231E-02 1.40E-02	G K
			898.02	1.117E-02	& P	4.189E-02 1.19E-02	G
NB-94		-2.0167E-03					
			871.10	-2.017E-03	&(	6.523E-02 1.83E-02	G K
			702.50	3.406E-02	%	4.623E-02 1.47E-02	G K
Ag-108M		-1.2760E-02					
			722.95	-1.276E-02	%(	6.300E-02 1.83E-02	G K
			614.37	-1.407E-02	& P	6.110E-02 1.78E-02	G
			433.93	-4.841E-03	&	6.360E-02 1.85E-02	G
CD-109		1.3355E+00					
			88.04	1.336E+00	&(	3.045E+00 9.21E-01	G
SN-113		6.2174E-03					
			391.71	6.217E-03	%(	6.639E-02 1.91E-02	G K
			255.04	-2.504E-01	%	2.383E+00 7.00E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	9.0110E-02						
		427.95	-4.045E-03	&(P	1.943E-01	5.61E-02	G K
		600.77	1.024E-01	% P	1.916E-01	5.89E-02	G
		636.15	7.745E-02	% P	4.044E-01	1.16E-01	G
		463.51	3.688E-01	(P	4.828E-01	1.51E-01	G
		176.29	-2.075E-01	%	9.082E-01	2.71E-01	G
I-131	1.0760E-02						
		364.48	1.076E-02	%(P	8.910E-02	2.59E-02	G K
		636.97	2.265E-01	&	8.916E-01	2.59E-01	G
		284.29	-9.068E-03	& P	1.223E+00	3.55E-01	G
CS-134	2.5725E-02						
		604.66	2.593E-04	%(	5.502E-02	1.55E-02	G K
		795.76	5.483E-02	(P	4.584E-02	1.62E-02	G
		569.29	-1.499E-02	& P	3.680E-01	1.03E-01	G
		801.84	-3.404E-02	% P	6.419E-01	1.74E-01	G
CS-137	4.5188E-01						
		661.62	4.519E-01	@(P	7.912E-02	4.21E-02	G
CE-139	3.3960E-03						
		165.85	3.396E-03	&(	6.766E-02	1.99E-02	G
EU-152	4.5083E-02						
		121.78	4.508E-02	&(P	1.675E-01	4.99E-02	G K
		344.30	5.231E-02	% P	1.758E-01	5.23E-02	G
		1408.08	9.326E-02	%	2.602E-01	7.67E-02	G
		964.00	9.914E-02	% P	5.287E-01	1.53E-01	G
		1112.07	8.623E-02	%	3.931E-01	1.12E-01	G
		778.90	8.476E-02	&	2.884E-01	8.36E-02	G
EU-154	-3.4159E-03						
		123.10	-3.416E-03	%(	1.443E-01	4.24E-02	G K
		1274.80	3.573E-02	%	1.736E-01	4.95E-02	G
		723.30	-6.503E-02	%	2.941E-01	8.56E-02	G
		1004.80	7.024E-03	%	3.179E-01	8.71E-02	G
EU-155	-3.0410E-02						
		86.45	-3.041E-02	&(	4.057E-01	1.21E-01	G K
		105.31	4.063E-02	%	3.278E-01	9.72E-02	G
HG-203	-2.6910E-03						
		279.17	-2.691E-03	&(P	5.288E-02	1.53E-02	G K
		72.87	-9.017E-01	% P	3.404E+00	1.02E+00	G
		70.83	-7.469E-02	&	7.719E+00	2.29E+00	G
		82.50	1.069E+00	&	6.061E+00	1.81E+00	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments

TL-208       2.9924E-01
                          583.14 2.992E-01  (P 5.589E-02 2.82E-02 G
                          510.72 7.055E-01 + P 2.712E-01 1.10E-01 G

PB-212       8.8451E-01
                          238.63 8.706E-01  (P 1.513E-01 6.14E-02 G K
                                                          Energy duplication
                           77.11 8.374E-01 } P 5.834E-01 1.83E-01 G
                           74.81 9.471E-01  (P 1.185E+00 3.68E-01 G

PB-214       6.8779E-01
                          351.99 6.427E-01  (P 1.332E-01 5.94E-02 G K
                          295.22 7.750E-01  (P 2.547E-01 1.03E-01 G
                                                          Energy duplication
                           77.11 0.000E+00 } P 1.392E+00 0.00E+00 G
                          241.92 6.361E-01 %   9.102E-01 2.79E-01 G

BI-212       8.6938E-01
                          727.17 8.694E-01 *(P 4.121E-01 1.73E-01 G K
                         1620.56 3.125E-01 % P 1.865E+00 5.10E-01 G
                          785.42 6.575E-01 %   2.269E+00 6.62E-01 G

BI-214       7.6887E-01
                          609.32 7.291E-01  (P 1.225E-01 6.37E-02 G K
                         1764.51 3.062E-01 - P 3.018E-01 1.02E-01 G
                         1120.28 8.909E-01  (P 2.990E-01 1.47E-01 G

RA-224       1.6954E+00
                          241.00 1.695E+00  (  1.643E+00 5.15E-01 G

RA-226       1.9326E+00
                          185.99 1.933E+00 *(P 1.488E+00 5.08E-01 G

AC-228       9.1498E-01
                          911.07 9.150E-01  (P 1.866E-01 9.95E-02 G K
                          968.90 1.215E+00 + P 3.441E-01 1.76E-01 G
                          338.40 6.493E-01 - P 3.663E-01 1.30E-01 G

TH-227      -6.0364E-02
                          236.00-6.036E-02 &(  6.145E-01 1.82E-01 G K
                          256.25 3.206E-03 & P 6.399E-01 1.85E-01 G

PA-234      -8.9678E-02
                           98.44-8.968E-02 %(P 3.266E-01 9.76E-02 G K
                          946.00-2.100E-02 & P 2.443E-01 6.74E-02 G
                          131.28 6.880E-03 & P 3.164E-01 9.34E-02 G
                           94.67-2.118E-03 % P 6.000E-01 1.77E-01 G
                          883.24-5.034E-02 %   4.474E-01 1.26E-01 G
                          926.70-1.257E-03 %   4.360E-01 1.18E-01 G
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 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26-2.214E-02 & P 5.435E-01 1.52E-01 G

TH-234      -3.3083E-01
                           63.29-3.308E-01 %(P 1.032E+01 3.02E+00 G K
                           92.80 2.075E+00 % P 3.304E+00 1.00E+00 G
                           92.38 2.381E+00 & P 3.985E+00 1.20E+00 G

AM-241      -5.8504E-02
                           59.54-5.850E-02 %(P 1.766E+00 5.20E-01 G
   ( - This peak used in the nuclide activity average.

   * - Peak is too wide, but only one peak in library.
   ! - Peak is part of a multiplet and this area went
       negative during deconvolution.
   ? - Peak is too narrow.
   @ - Peak is too wide at FW25M, but ok at FWHM.
   % - Peak fails sensitivity test.
   $ - Peak identified, but first peak of this nuclide
       failed one or more qualification tests.
   + - Peak activity higher than counting uncertainty range.
   - - Peak activity lower than counting uncertainty range.
   = - Peak outside analysis energy range.
   & - Calculated peak centroid is not close enough to the
       library energy centroid for positive identification.
   P - Peakbackground subtraction
   } - Peak is too close to another for the activity
       to be found directly.

   Nuclide Codes:                      Peak Codes:
   T - Thermal Neutron Activation      G - Gamma Ray
   F - Fast Neutron Activation         X - X-Ray
   I - Fission Product                 P - Positron Decay
   N - Naturally Occurring Isotope     S - Single-Escape
   P - Photon Reaction                 D - Double-Escape
   C - Charged Particle Reaction       K - Key Line
   M - No MDA Calculation              A - Not in Average
   R - Coincidence Corrected           C - Coincidence Peak
   H - Halflife limit exceeded

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
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***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	7.6615E-02	8.1703E-02	4.5366E-01	4.5369E-01	4.881E-01
K-40		1.3030E+01	1.3030E+01	1.7948E+00	1.9477E+00	
MN-54	#A	3.9860E-03	4.0301E-03	4.0176E-02	4.0176E-02	4.785E-02
CO-57	#B	4.7181E-05	4.7785E-05	6.7980E-02	6.7980E-02	7.596E-02
CO-60	#B	3.0420E-04	3.0475E-04	4.4231E-02	4.4231E-02	5.739E-02

Sr-85	#A	-1.5326E-02	-1.6160E-02	6.7718E-02	6.7724E-02	7.246E-02
Kr-85	#A	-3.5373E+02	-3.5374E+02	1.4827E+03	1.4829E+03	1.673E+03
Y-88	#B	-7.4658E-03	-7.7102E-03	4.4264E-02	4.4267E-02	5.065E-02
NB-94	#B	-2.0167E-03	-2.0167E-03	5.5022E-02	5.5023E-02	6.523E-02
Ag-108M	#B	-1.2759E-02	-1.2760E-02	5.4811E-02	5.4816E-02	6.299E-02
CD-109	#A	1.3254E+00	1.3355E+00	2.7643E+00	2.7653E+00	3.022E+00
SN-113	#B	6.0347E-03	6.2174E-03	5.7243E-02	5.7244E-02	6.444E-02
SB-125	#B	8.9805E-02	9.0110E-02	1.1086E-01	1.1098E-01	1.937E-01
I-131	#B	7.0204E-03	1.0760E-02	7.7686E-02	7.7689E-02	5.814E-02
CS-134	#B	2.5608E-02	2.5725E-02	2.2810E-02	2.2859E-02	5.477E-02
CS-137	#	4.5174E-01	4.5188E-01	1.2624E-01	1.2893E-01	
CE-139	#A	3.3122E-03	3.3960E-03	5.9806E-02	5.9806E-02	6.599E-02
EU-152	#B	4.5050E-02	4.5083E-02	1.4970E-01	1.4973E-01	1.674E-01
EU-154	#B	-3.4122E-03	-3.4159E-03	1.2731E-01	1.2731E-01	1.441E-01
EU-155	#B	-3.0353E-02	-3.0410E-02	3.6192E-01	3.6192E-01	4.049E-01
HG-203	#B	-2.4998E-03	-2.6910E-03	4.7239E-02	4.7239E-02	4.913E-02
TL-208		2.9924E-01	2.9924E-01	8.4555E-02	8.6321E-02	
PB-212		8.8451E-01	8.8451E-01	1.8713E-01	1.9405E-01	
PB-214		6.8779E-01	6.8779E-01	1.6654E-01	1.7126E-01	
BI-212	#	8.6938E-01	8.6938E-01	5.1999E-01	5.2244E-01	
BI-214		7.6887E-01	7.6887E-01	2.0146E-01	2.0634E-01	
RA-224	#	1.6954E+00	1.6954E+00	1.5439E+00	1.5471E+00	1.643E+00
RA-226	#	1.9326E+00	1.9326E+00	1.5254E+00	1.5295E+00	
AC-228		9.1498E-01	9.1498E-01	2.9851E-01	3.0320E-01	
TH-227	#B	-6.0364E-02	-6.0364E-02	5.4707E-01	5.4708E-01	6.145E-01
PA-234	#B	-8.9678E-02	-8.9678E-02	3.1710E-01	3.1714E-01	3.266E-01
TH-234	#B	-3.3083E-01	-3.3083E-01	3.4134E+01	3.4134E+01	1.032E+01
AM-241	#A	-5.8502E-02	-5.8504E-02	1.7902E+00	1.7902E+00	1.766E+00

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (87.4 to 2000.7 keV) 1.9839523E+01 pCi/gm
Total Decayed Activity (87.4 to 2000.7 keV) 1.9839676E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JJM

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 103F_5SEPT2006_1326.An1

Sample description
FSS-OOL-05-07-010-F

Spectrum Filename: C:\GammaVision\Spectra\103F_5SEPT2006_1326.An1

Acquisition information
Start time: 05-Sep-2006 13:26:37
Live time: 2000
Real time: 2002
Dead time: 0.10 %
Detector ID: 4

Detector system
Det 103 - DSPE-471

Calibration
Filename: D3_1LSa.Clb
Detector_103 1.0 Liter Sand Geometry

Energy Calibration
Created: 08-Aug-2005 11:09:41
Zero offset: 0.409 keV
Gain: 0.500 keV/channel
Quadratic: 1.092E-08 keV/channel^2

Efficiency Calibration
Created: 08-Aug-2005 11:11:25
Type: Polynomial
Uncertainty: 0.993 %
Coefficients: -0.264059 -5.138468 0.638383
-0.089199 0.005011 -0.000129

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.41keV)
Stop channel: 4000 (2000.67keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 1.9210E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.9210E+03) =
5.2056E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	31-Aug-2006 13:10:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	103_150K_05AUG05.Pbc 08-Aug-2005 12:54:15
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 19 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.1538

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
74.97	91.	28.81	0.99	9.052E-03	74.81	9.600	7.332E-01	PB212
77.27	137.	20.13	0.99	1.011E-02	77.11	10.700	1.310E+00	PB214
					77.11	17.500	8.012E-01	PB212
90.07	68.	41.44	1.00	1.542E-02				
93.37	68.	39.84	1.00	1.659E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
186.31	162.	24.70	1.29	2.566E-02	185.99	3.280	1.242E+00	RA226
209.27	109.	34.74	1.30	2.471E-02				
238.73	872.	4.04	1.09	2.320E-02	238.63	43.100	6.053E-01	PB212
241.86	132.	18.68	1.10	2.303E-02	241.00	3.900	1.029E+00	RA224
					241.92	7.470	5.384E-01	PB214
269.86	82.	35.65	1.08	2.153E-02				
295.29	210.	13.61	1.26	2.024E-02	295.22	19.200	3.717E-01	PB214
327.90	55.	39.57	1.19	1.875E-02				
338.37	258.	12.12	1.08	1.830E-02	338.40	12.010	8.222E-01	AC228
351.95	386.	9.77	1.20	1.775E-02	351.99	37.100	4.065E-01	PB214
463.11	80.	27.72	1.46	1.426E-02				
463.11	80.	27.72	1.46	1.426E-02	463.51	10.000	3.886E-01	SB125
510.80	140.	14.09	1.07	1.317E-02	510.72	22.500	2.702E-01	TL208
583.27	324.	8.86	1.21	1.184E-02	583.14	86.000	2.204E-01	TL208
609.44	294.	8.72	1.39	1.144E-02	609.32	46.090	3.842E-01	BI214
661.61	106.	22.56	0.97	1.072E-02	661.62	84.620	8.090E-02	CS137
727.68	91.	17.97	1.28	9.959E-03	727.17	11.800	5.415E-01	BI212
768.24	48.	33.12	1.08	9.554E-03				
795.29	60.	25.22	1.15	9.305E-03				
795.29	60.	25.22	1.15	9.305E-03	795.76	85.400	5.295E-02	CS134
860.17	74.	26.94	1.31	8.770E-03				

911.41	201.	10.01	1.36	8.399E-03	911.07	29.000	5.706E-01	AC228
964.54	53.	23.64	1.54	8.052E-03	964.00	14.580	3.161E-01	EU152
969.27	129.	11.51	1.54	8.023E-03	968.90	17.460	6.451E-01	AC228
1120.52	90.	21.10	1.24	7.211E-03	1120.28	15.040	5.701E-01	BI214
1172.84	104.	19.25	1.15	6.973E-03	1173.23	99.860	1.029E-01	CO60
1238.11	74.	28.55	1.60	6.702E-03				
1332.67	69.	18.74	1.89	6.349E-03	1332.51	99.980	7.377E-02	CO60
1461.10	1049.	3.14	1.90	5.931E-03	1460.75	10.700	1.142E+01	K40

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
1765.18	59.	14.12	0.85	5.140E-03	1764.51	15.920	4.806E-01	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
179.32	89.91	366.	68.	0.034	124.31	1.003	PB-214	lD
185.91	93.21	338.	68.	0.034	119.52	1.005	U-235	lD
417.69	209.27	514.	109.	0.055	104.23	1.298	AC-228	s
538.88	269.86	309.	82.	0.041	106.95	1.083	AC-228	
654.95	327.90	182.	55.	0.027	118.70	1.194	AC-228	
1535.54	768.24	74.	48.	0.024	99.36	1.081	BI-214	M
1719.38	860.17	86.	74.	0.037	80.83	1.311	TL-208	s
1928.93	964.64	47.	59.	0.030	62.46	1.538	AC-228	D
2475.16	1238.11	98.	74.	0.037	85.65	1.602	BI-214	

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.
M - Peak is close to a library peak.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-212	148.79	74.81	320.	91.	0.045	86.43	0.993D
PB-212	153.39	77.11	316.	137.	0.068	60.40	0.995A
RA-226	371.48	186.16	651.	121.	0.061	83.96	1.500s
PB-212	476.70	238.77	692.	773.	0.387	19.57	1.082
RA-224	482.72	241.78	664.	119.	0.059	95.90	1.500
PB-214	589.73	295.29	246.	205.	0.103	40.84	1.257
AC-228	675.87	338.37	241.	257.	0.128	36.36	1.080
PB-214	703.05	351.95	310.	381.	0.190	29.30	1.199
SB-125	924.99	462.94	136.	66.	0.033	81.80	1.500
TL-208	1020.70	510.80	127.	114.	0.057	42.26	1.066s
TL-208	1165.64	583.27	147.	319.	0.160	26.59	1.206
BI-214	1217.98	609.44	124.	288.	0.144	26.16	1.392
CS-137	1322.31	661.61	142.	104.	0.052	67.68	0.965
BI-212	1454.43	727.68	63.	91.	0.045	53.91	1.282
CS-134	1589.48	795.21	51.	44.	0.022	83.24	1.500
AC-228	1821.85	911.41	71.	198.	0.099	30.04	1.364
EU-152	1928.80	964.89	100.	42.	0.021	109.91	1.538s
AC-228	1936.81	968.90	46.	129.	0.064	34.57	1.541D

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
BI-214	2240.01	1120.52	81.	88.	0.044	63.31	1.239
CO-60	2344.64	1172.84	77.	102.	0.051	57.75	1.147
CO-60	2664.26	1332.67	33.	66.	0.033	56.23	1.886s
K-40	2921.06	1461.10	26.	1031.	0.515	9.42	1.898
BI-214	3529.12	1765.18	6.	56.	0.028	42.35	0.853s

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	Peak MDA Value pCi/gm	COMMENTS
BE-7		9.7869E-02					
			477.56	9.787E-02	%(	2.879E-01 8.61E-02 G	
K-40		1.1423E+01					
			1460.75	1.142E+01	(P	2.950E-01 3.65E-01 G	
MN-54		8.6981E-05					
			834.81	8.698E-05	%(P	2.389E-02 6.58E-03 G	
CO-57		-7.9426E-04					
			122.07	-7.943E-04	%(P	4.736E-02 1.41E-02 G K	
			136.43	-4.483E-02	%	3.596E-01 1.07E-01 G	
CO-60		8.8329E-02					
			1332.51	7.377E-02	*(P	3.252E-02 1.44E-02 G K	
			1173.23	1.029E-01	(P	4.423E-02 2.02E-02 G K	
Sr-85		-1.7700E-02					
			514.00	-1.770E-02	%(	4.111E-02 1.24E-02 G	
Kr-85		-3.8744E+02					
			513.99	-3.874E+02	%(	8.995E+02 2.72E+02 G	
Y-88		-9.2392E-05					
			1836.01	-9.239E-05	%(P	2.402E-02 6.06E-03 G K	
			898.02	-5.870E-03	% P	3.557E-02 1.02E-02 G	
NB-94		9.1110E-03					
			871.10	9.111E-03	%(	2.814E-02 8.33E-03 G K	
			702.50	2.025E-02	%	2.954E-02 9.19E-03 G K	

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
Ag-108M	-8.1900E-03						
		722.95	-8.190E-03	%(	3.784E-02	1.11E-02	G K
		614.37	-9.387E-03	% P	3.742E-02	1.11E-02	G
		433.93	-5.362E-03	%	3.236E-02	9.54E-03	G
CD-109	-2.2382E-02						
		88.04	-2.238E-02	&(	1.476E+00	4.38E-01	G
SN-113	7.3711E-04						
		391.71	7.371E-04	%(	4.826E-02	1.41E-02	G K
		255.04	6.419E-02	&	1.439E+00	4.25E-01	G
SB-125	1.0132E-01						
		427.95	2.505E-02	%(P	8.416E-02	2.50E-02	G K
		600.77	3.566E-02	% P	1.558E-01	4.59E-02	G
		636.15	4.748E-04	& P	2.388E-01	6.77E-02	G
		463.51	3.271E-01	(P	2.827E-01	9.09E-02	G
		176.29	1.688E-01	&	4.885E-01	1.47E-01	G
I-131	-5.6334E-03						
		364.48	-5.633E-03	%(P	5.109E-02	1.50E-02	G K
		636.97	1.017E-01	&	5.888E-01	1.72E-01	G
		284.29	-1.879E-01	% P	7.866E-01	2.35E-01	G
CS-134	2.5145E-02						
		604.66	1.328E-02	%(	2.068E-02	6.44E-03	G K
		795.76	3.870E-02	(P	3.215E-02	1.08E-02	G
		569.29	-2.370E-03	& P	2.176E-01	6.26E-02	G
		801.84	-1.432E-02	% P	4.648E-01	1.33E-01	G
CS-137	8.0901E-02						
		661.62	8.090E-02	(P	4.512E-02	1.85E-02	G
CE-139	3.1478E-03						
		165.85	3.148E-03	%(	4.398E-02	1.31E-02	G
EU-152	8.6306E-02						
		121.78	4.363E-03	%(P	1.248E-01	3.71E-02	G K
		344.30	-2.833E-03	% P	1.027E-01	3.00E-02	G
		1408.08	2.472E-02	%	1.154E-01	3.27E-02	G
		964.00	2.506E-01	@(P	2.953E-01	9.30E-02	G
		1112.07	0.000E+00	%	3.099E-01	8.82E-02	G
		778.90	-3.768E-03	%	2.289E-01	6.49E-02	G
EU-154	1.1252E-03						
		123.10	1.125E-03	%(	8.046E-02	2.38E-02	G K
		1274.80	-1.604E-04	&	1.073E-01	3.01E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
		723.30	3.599E-02	%	1.237E-01	3.64E-02	G
		1004.80	5.251E-02	&	1.643E-01	4.85E-02	G
EU-155	1.1925E-01						
		86.45	1.192E-01	%(	2.148E-01	6.53E-02	G K
		105.31	-3.734E-03	%	2.034E-01	6.05E-02	G
HG-203	8.4689E-03						
		279.17	8.469E-03	&(P	3.601E-02	1.07E-02	G K
		72.87	7.961E-02	& P	1.961E+00	5.84E-01	G
		70.83	-5.869E-01	&	3.989E+00	1.19E+00	G
		82.50	2.467E-01	%	3.508E+00	1.05E+00	G
TL-208	2.3074E-01						
		583.14	2.204E-01	(P	4.086E-02	1.98E-02	G
		510.72	2.702E-01	*(P	1.312E-01	4.70E-02	G
PB-212	5.4387E-01						
		238.63	5.439E-01	(P	8.815E-02	3.60E-02	G K
							Energy duplication
		77.11	5.439E-01	} P	3.402E-01	1.10E-01	G
		74.81	7.332E-01	+ P	6.972E-01	2.18E-01	G
PB-214	3.9462E-01						
		351.99	4.065E-01	(P	9.059E-02	4.03E-02	G K
		295.22	3.717E-01	(P	1.370E-01	5.16E-02	G
							Energy duplication
		77.11	0.000E+00	} P	8.367E-01	0.00E+00	G
		241.92	3.406E-01	%	5.214E-01	1.59E-01	G
BI-212	5.4146E-01						
		727.17	5.415E-01	(P	2.384E-01	9.79E-02	G K
		1620.56	2.899E-01	% P	9.825E-01	2.84E-01	G
		785.42	7.262E-01	%	1.718E+00	5.17E-01	G
BI-214	4.0893E-01						
		609.32	3.842E-01	(P	7.287E-02	3.43E-02	G K
		1764.51	4.806E-01	(P	1.220E-01	7.18E-02	G
		1120.28	5.701E-01	+ P	2.897E-01	1.23E-01	G
RA-224	9.3011E-01						
		241.00	9.301E-01	(	9.598E-01	2.97E-01	G
RA-226	1.0126E+00						
		185.99	1.013E+00	*(P	1.016E+00	3.14E-01	G
AC-228	5.9928E-01						
		911.07	5.706E-01	(P	1.215E-01	5.81E-02	G K
		968.90	6.469E-01	(P	1.725E-01	7.46E-02	G
		338.40	8.222E-01	+ P	2.403E-01	1.00E-01	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments

TH-227      -1.1731E-01
                          236.00-1.173E-01 %(  3.506E-01 1.06E-01 G K
                          256.25 1.557E-01 % P 4.176E-01 1.26E-01 G

PA-234      -1.3092E-02
                           98.44-1.309E-02 %(P 1.992E-01 5.93E-02 G K
                          946.00 1.058E-03 % P 1.590E-01 4.47E-02 G
                          131.28-2.391E-02 % P 1.923E-01 5.74E-02 G
                           94.67-6.071E-02 % P 3.660E-01 1.10E-01 G
                          883.24-1.203E-02 %   2.725E-01 7.76E-02 G
                          926.70-1.503E-02 %   3.273E-01 9.36E-02 G
                          569.26-3.500E-03 & P 3.213E-01 9.25E-02 G

TH-234       1.7393E+00
                           63.29 1.739E+00 %(P 5.454E+00 1.64E+00 G K
                           92.80 1.020E+00 & P 1.915E+00 5.79E-01 G
                           92.38 1.168E+00 & P 2.337E+00 7.06E-01 G

AM-241      -1.9248E-02
                           59.54-1.925E-02 &(P 1.026E+00 3.04E-01 G
   ( - This peak used in the nuclide activity average.

   * - Peak is too wide, but only one peak in library.
   ! - Peak is part of a multiplet and this area went
       negative during deconvolution.
   ? - Peak is too narrow.
   @ - Peak is too wide at FW25M, but ok at FWHM.
   % - Peak fails sensitivity test.
   $ - Peak identified, but first peak of this nuclide
       failed one or more qualification tests.
   + - Peak activity higher than counting uncertainty range.
   - - Peak activity lower than counting uncertainty range.
   = - Peak outside analysis energy range.
   & - Calculated peak centroid is not close enough to the
       library energy centroid for positive identification.
   P - Peakbackground subtraction
   } - Peak is too close to another for the activity
       to be found directly.

   Nuclide Codes:                      Peak Codes:
   T - Thermal Neutron Activation      G - Gamma Ray
   F - Fast Neutron Activation         X - X-Ray
   I - Fission Product                 P - Positron Decay
   N - Naturally Occurring Isotope     S - Single-Escape
   P - Photon Reaction                 D - Double-Escape
   C - Charged Particle Reaction       K - Key Line
   M - No MDA Calculation              A - Not in Average
```

R - Coincidence Corrected C - Coincidence Peak
H - Halflife limit exceeded

- -

***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	9.1705E-02	9.7869E-02	2.5827E-01	2.5834E-01	2.698E-01
K-40		1.1423E+01	1.1423E+01	1.0956E+00	1.2807E+00	
MN-54	#A	8.6019E-05	8.6981E-05	1.9755E-02	1.9755E-02	2.362E-02
CO-57	#B	-7.8410E-04	-7.9426E-04	6.2419E-02	6.2419E-02	4.675E-02
CO-60		8.8170E-02	8.8329E-02	3.6640E-02	3.6997E-02	
Sr-85	#A	-1.6777E-02	-1.7700E-02	3.7258E-02	3.7272E-02	3.896E-02
Kr-85	#A	-3.8742E+02	-3.8744E+02	8.1532E+02	8.1563E+02	8.995E+02
Y-88	#B	-8.9430E-05	-9.2392E-05	2.2896E-03	2.2896E-03	2.325E-02
NB-94	#B	9.1110E-03	9.1110E-03	2.4985E-02	2.4991E-02	2.814E-02
Ag-108M	#B	-8.1894E-03	-8.1900E-03	3.3404E-02	3.3407E-02	3.784E-02
CD-109	#A	-2.2211E-02	-2.2382E-02	1.3139E+00	1.3139E+00	1.465E+00
SN-113	#B	7.1520E-04	7.3711E-04	4.2285E-02	4.2285E-02	4.683E-02
SB-125	#F	1.0098E-01	1.0132E-01	8.4485E-02	8.4690E-02	8.387E-02
I-131	#B	-3.6571E-03	-5.6334E-03	5.4217E-02	5.4218E-02	3.316E-02
CS-134	#F	2.5030E-02	2.5145E-02	2.0974E-02	2.1024E-02	2.058E-02
CS-137		8.0876E-02	8.0901E-02	5.5486E-02	5.5684E-02	
CE-139	#A	3.0693E-03	3.1478E-03	3.9314E-02	3.9314E-02	4.288E-02
EU-152	#B	8.6241E-02	8.6306E-02	9.6093E-02	9.6212E-02	1.247E-01
EU-154	#B	1.1240E-03	1.1252E-03	7.1485E-02	7.1485E-02	8.037E-02
EU-155	#B	1.1902E-01	1.1925E-01	1.9605E-01	1.9616E-01	2.144E-01
HG-203	#B	7.8604E-03	8.4689E-03	3.2220E-02	3.2223E-02	3.342E-02
TL-208		2.3074E-01	2.3074E-01	6.2187E-02	6.3614E-02	
PB-212		5.4387E-01	5.4387E-01	1.0806E-01	1.1258E-01	
PB-214		3.9462E-01	3.9462E-01	1.0096E-01	1.0353E-01	
BI-212		5.4146E-01	5.4146E-01	2.9349E-01	2.9517E-01	
BI-214		4.0893E-01	4.0893E-01	1.0673E-01	1.0934E-01	
RA-224	A	9.3011E-01	9.3011E-01	8.9201E-01	8.9364E-01	9.598E-01
RA-226	#A	1.0126E+00	1.0126E+00	9.4107E-01	9.4291E-01	1.016E+00
AC-228		5.9928E-01	5.9928E-01	1.3833E-01	1.4264E-01	
TH-227	#B	-1.1731E-01	-1.1731E-01	3.1703E-01	3.1710E-01	3.506E-01
PA-234	#B	-1.3092E-02	-1.3092E-02	2.2459E-01	2.2459E-01	1.992E-01
TH-234	#B	1.7393E+00	1.7393E+00	4.9131E+00	4.9140E+00	5.454E+00
AM-241	#A	-1.9247E-02	-1.9248E-02	1.0916E+00	1.0916E+00	1.026E+00

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.

H - Halflife limit exceeded

YAEC Chemistry Lab Spectrum name: 103F_5SEPT2006_1326.An1

---------- S U M M A R Y ----------

Total Activity (1120.0 to 2000.7 keV) 1.5241044E+01 pCi/gm
Total Decayed Activity (1120.0 to 2000.7 keV) 1.5241229E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JPK

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 103F_5SEPT2006_1406.An1

Sample description
FSS-OOL-05-07-019-F-B

Spectrum Filename: C:\GammaVision\Spectra\103F_5SEPT2006_1406.An1

Acquisition information
Start time: 05-Sep-2006 14:06:41
Live time: 2000
Real time: 2002
Dead time: 0.11 %
Detector ID: 4

Detector system
Det 103 - DSPE-471

Calibration
Filename: D3_1LSa.Clb
Detector_103 1.0 Liter Sand Geometry

Energy Calibration
Created: 08-Aug-2005 11:09:41
Zero offset: 0.409 keV
Gain: 0.500 keV/channel
Quadratic: 1.092E-08 keV/channel^2

Efficiency Calibration
Created: 08-Aug-2005 11:11:25
Type: Polynomial
Uncertainty: 0.993 %
Coefficients: -0.264059 -5.138468 0.638383
-0.089199 0.005011 -0.000129

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.41keV)
Stop channel: 4000 (2000.67keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 1.7350E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.7350E+03) =
5.7637E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	31-Aug-2006 13:47:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	103_150K_05AUG05.Pbc 08-Aug-2005 12:54:15
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 15 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.1587

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
74.76	113.	21.52	0.99	9.100E-03	74.81	9.600	9.878E-01	PB212
77.16	195.	14.27	0.99	1.020E-02	77.11	17.500	8.444E-01	PB212
87.38	95.	41.20	1.50	1.472E-02	86.45	32.740	PBC<MDA	EU155
					88.04	3.790	1.340E+00	CD109
186.17	144.	24.78	1.14	2.566E-02	185.99	3.280	1.214E+00	RA226
209.43	99.	31.90	0.75	2.471E-02				
238.77	938.	3.86	1.09	2.320E-02	238.63	43.100	7.212E-01	PB212
241.85	118.	19.74	1.10	2.303E-02	241.00	3.900	1.021E+00	RA224
					241.92	7.470	5.341E-01	PB214
270.55	78.	36.72	0.82	2.149E-02				
277.56	68.	29.99	1.52	2.113E-02				
295.27	238.	10.80	1.28	2.025E-02	295.22	19.200	4.687E-01	PB214
300.24	66.	31.73	1.40	2.001E-02				
327.87	67.	30.86	0.76	1.875E-02				
338.44	227.	13.24	0.80	1.830E-02	338.40	12.010	7.998E-01	AC228
352.01	399.	7.81	1.21	1.775E-02	351.99	37.100	4.647E-01	PB214
463.27	66.	23.59	1.41	1.425E-02				
463.27	66.	23.59	1.41	1.425E-02	463.51	10.000	3.523E-01	SB125
510.97	137.	16.15	1.20	1.317E-02	510.72	22.500	2.899E-01	TL208
583.18	336.	8.03	1.17	1.184E-02	583.14	86.000	2.535E-01	TL208
609.46	305.	7.49	0.93	1.144E-02	609.32	46.090	4.407E-01	BI214
661.35	40.	32.31	1.56	1.073E-02				
661.35	40.	32.31	1.56	1.073E-02	661.62	84.620	PBC<MDA	CS137
727.31	54.	27.39	0.95	9.963E-03	727.17	11.800	3.511E-01	BI212
785.91	66.	27.46	0.88	9.390E-03	785.42	2.000	2.736E+00	BI212
795.09	49.	24.38	1.62	9.307E-03				
795.09	49.	24.38	1.62	9.307E-03	795.76	85.400	4.858E-02	CS134

860.90	61.	27.47	1.26	8.765E-03				
911.44	255.	8.62	1.55	8.399E-03	911.07	29.000	8.044E-01	AC228
964.93	68.	16.04	1.54	8.051E-03	964.00	14.580	4.462E-01	EU152
969.36	125.	11.34	1.54	8.023E-03	968.90	17.460	6.966E-01	AC228
1121.50	89.	23.01	1.19	7.206E-03	1120.28	15.040	6.248E-01	BI214
1461.19	1146.	3.04	1.77	5.931E-03	1460.75	10.700	1.383E+01	K40
1621.57	21.	21.82	2.00	5.488E-03	1620.56	2.750	1.082E+00	BI212
1764.94	72.	11.79	1.42	5.141E-03	1764.51	15.920	6.540E-01	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
418.03	209.43	387.	99.	0.049	95.71	0.747	AC-228	
540.24	270.55	297.	78.	0.039	110.17	0.820	AC-228	s
599.63	300.24	172.	66.	0.033	95.19	1.402	PB-212	s
654.89	327.87	169.	67.	0.033	92.57	0.761	AC-228	s
1570.88	785.91	102.	39.	0.020	118.96	0.883	PB-214	sM
1720.85	860.90	68.	61.	0.030	69.29	1.257	TL-208	
1929.44	964.87	29.	64.	0.032	51.87	1.538	AC-228	D

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.
M - Peak is close to a library peak.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-212	148.79	74.81	281.	112.	0.056	67.38	0.993D
PB-212	153.39	77.11	292.	178.	0.089	39.81	0.995A
CD-109	173.94	87.38	722.	95.	0.048	123.59	1.500s
RA-226	371.80	186.32	617.	116.	0.058	85.28	1.500s
PB-212	476.82	238.83	435.	975.	0.488	13.74	1.053
RA-224	482.65	241.75	623.	98.	0.049	112.45	1.500
PB-214	589.69	295.27	196.	234.	0.117	32.39	1.280
AC-228	676.03	338.44	242.	226.	0.113	39.73	0.798
PB-214	703.16	352.01	209.	393.	0.196	23.42	1.208
SB-125	925.26	463.07	117.	71.	0.035	72.63	1.500
TL-208	1021.05	510.97	153.	110.	0.055	48.46	1.204s
TL-208	1165.47	583.18	120.	331.	0.166	24.10	1.174
BI-214	1218.01	609.46	90.	298.	0.149	22.47	0.926
CS-137	1322.72	661.82	71.	40.	0.020	97.53	1.500s
BI-212	1453.70	727.31	65.	53.	0.027	82.17	0.948s
CS-134	1589.88	795.41	44.	50.	0.025	70.16	1.500s
AC-228	1821.91	911.44	72.	252.	0.126	25.85	1.551
AC-228	1936.81	968.90	36.	124.	0.062	33.66	1.541D
BI-214	2241.97	1121.50	91.	87.	0.044	69.04	1.190s
K-40	2921.24	1461.19	34.	1127.	0.563	9.11	1.770
BI-212	3241.95	1621.57	0.	21.	0.010	65.47	2.000
BI-214	3528.62	1764.94	3.	69.	0.034	35.36	1.417s

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	MDA Value pCi/gm	COMMENTS
BE-7		7.7042E-02					
			477.56	7.704E-02	%(	3.306E-01 9.79E-02	G
K-40		1.3827E+01					
			1460.75	1.383E+01	(P	3.678E-01 4.27E-01	G
MN-54		-2.2330E-03					
			834.81	-2.233E-03	%(P	3.178E-02 8.99E-03	G
CO-57		-8.5467E-03					
			122.07	-8.547E-03	%(P	5.170E-02 1.55E-02	G K
			136.43	-9.717E-02	%	3.953E-01 1.19E-01	G
CO-60		9.1794E-03					
			1332.51	9.179E-03	%(P	3.541E-02 1.01E-02	G K
			1173.23	2.449E-02	% P	4.690E-02 1.42E-02	G K
Sr-85		-1.3892E-02					
			514.00	-1.389E-02	%(	4.416E-02 1.32E-02	G
Kr-85		-3.0338E+02					
			513.99	-3.034E+02	%(	9.661E+02 2.89E+02	G
Y-88		-1.0230E-04					
			1836.01	-1.023E-04	%(P	4.274E-02 1.16E-02	G K
			898.02	-6.202E-04	% P	3.185E-02 8.77E-03	G
NB-94		-8.0764E-04					
			871.10	-8.076E-04	%(	3.067E-02 8.61E-03	G K
			702.50	-4.700E-03	&	3.265E-02 9.47E-03	G K
Ag-108M		0.0000E+00					
			722.95	0.000E+00	%(	6.041E-02 1.76E-02	G K
			614.37	-1.584E-02	& P	4.223E-02 1.27E-02	G
			433.93	-4.945E-03	%	3.464E-02 1.02E-02	G
CD-109		1.3399E+00					
			88.04	1.340E+00	(	1.800E+00 5.52E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SN-113	0.0000E+00						
		391.71	0.000E+00	%(	5.256E-02	1.53E-02	G K
		255.04	1.850E-02	%	1.744E+00	5.15E-01	G
SB-125	1.0720E-01						
		427.95	1.222E-02	%(P	1.028E-01	3.01E-02	G K
		600.77	3.318E-02	& P	1.673E-01	4.90E-02	G
		636.15	2.031E-02	& P	2.238E-01	6.36E-02	G
		463.51	3.883E-01	(P	2.919E-01	9.57E-02	G
		176.29	3.530E-02	%	5.537E-01	1.65E-01	G
I-131	1.3333E-02						
		364.48	1.333E-02	%(P	5.092E-02	1.51E-02	G K
		636.97	1.802E-01	%	7.070E-01	2.09E-01	G
		284.29	-2.235E-01	% P	8.553E-01	2.56E-01	G
CS-134	2.3551E-02						
		604.66	8.360E-04	%(	3.372E-02	9.69E-03	G K
		795.76	4.951E-02	(P	3.320E-02	1.16E-02	G
		569.29	6.197E-02	% P	1.738E-01	5.16E-02	G
		801.84	-6.270E-03	& P	3.053E-01	8.34E-02	G
CS-137	3.4315E-02						
		661.62	3.432E-02	*(P	3.606E-02	1.15E-02	G
CE-139	-7.6580E-04						
		165.85	-7.658E-04	%(	4.705E-02	1.40E-02	G
EU-152	-2.5470E-02						
		121.78	-2.547E-02	%(P	1.457E-01	4.36E-02	G K
		344.30	-1.298E-02	% P	1.248E-01	3.68E-02	G
		1408.08	4.616E-02	%	1.528E-01	4.46E-02	G
		964.00	-2.534E-02	& P	4.409E-01	1.29E-01	G
		1112.07	5.377E-02	%	3.072E-01	8.91E-02	G
		778.90	-4.180E-02	%	2.525E-01	7.33E-02	G
EU-154	-1.5801E-02						
		123.10	-1.580E-02	&(	1.012E-01	3.03E-02	G K
		1274.80	-1.958E-02	%	1.160E-01	3.35E-02	G
		723.30	-6.973E-02	%	2.185E-01	6.52E-02	G
		1004.80	-4.612E-03	&	2.076E-01	5.86E-02	G
EU-155	1.5420E-01						
		86.45	1.542E-01	%(	2.291E-01	7.00E-02	G K
		105.31	3.381E-02	&	2.236E-01	6.69E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
HG-203	-1.0154E-02						
		279.17	-1.015E-02	&(P	4.561E-02	1.36E-02	G K
		72.87	-5.162E-01	& P	2.129E+00	6.39E-01	G
		70.83	5.181E-01	%	4.368E+00	1.30E+00	G
		82.50	-7.323E-01	&	4.051E+00	1.21E+00	G
TL-208	2.6103E-01						
		583.14	2.535E-01	(P	4.102E-02	2.06E-02	G
		510.72	2.899E-01	*(P	1.584E-01	5.82E-02	G
PB-212	7.8446E-01						
		238.63	7.595E-01	(P	7.782E-02	3.52E-02	G K
							Energy duplication
		77.11	7.845E-01	} P	3.622E-01	1.04E-01	G
		74.81	1.006E+00	+ P	7.242E-01	2.32E-01	G
PB-214	4.6606E-01						
		351.99	4.647E-01	(P	8.288E-02	3.68E-02	G K
		295.22	4.687E-01	(P	1.362E-01	5.15E-02	G
							Energy duplication
		77.11	1.756E-01	} P	7.953E-01	2.23E-01	G
		241.92	2.762E-01	%	5.573E-01	1.69E-01	G
BI-212	3.5111E-01						
		727.17	3.511E-01	@(P	2.668E-01	9.71E-02	G K
		1620.56	1.082E+00	+ P	3.804E-01	2.37E-01	G
		785.42	1.107E+00	%	1.742E+00	5.39E-01	G
BI-214	4.4072E-01						
		609.32	4.407E-01	(P	6.919E-02	3.37E-02	G K
		1764.51	6.540E-01	+ P	1.060E-01	8.08E-02	G
		1120.28	6.248E-01	+ P	3.387E-01	1.47E-01	G
RA-224	8.4678E-01						
		241.00	8.468E-01	(	1.031E+00	3.17E-01	G
RA-226	1.0696E+00						
		185.99	1.070E+00	*(P	1.096E+00	3.38E-01	G
AC-228	7.6984E-01						
		911.07	8.044E-01	(P	1.354E-01	7.03E-02	G K
		968.90	6.917E-01	(P	1.695E-01	7.77E-02	G
		338.40	7.998E-01	(P	2.666E-01	1.06E-01	G
TH-227	-2.2655E-01						
		236.00	-2.265E-01	&(	4.048E-01	1.23E-01	G K
		256.25	-9.090E-02	% P	4.847E-01	1.44E-01	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments

PA-234       3.3556E-02
                           98.44 3.356E-02 %(P 2.023E-01 6.04E-02 G K
                          946.00 3.054E-02 % P 1.683E-01 4.87E-02 G
                          131.28 1.043E-04 & P 1.774E-01 5.25E-02 G
                           94.67-3.622E-02 % P 3.262E-01 9.71E-02 G
                          883.24 4.619E-02 %   2.772E-01 8.01E-02 G
                          926.70-3.001E-02 %   3.095E-01 8.84E-02 G
                          569.26 9.151E-02 % P 2.566E-01 7.62E-02 G

TH-234      -9.8181E-02
                           63.29-9.818E-02 %(P 6.764E+00 2.00E+00 G K
                           92.80 1.212E+00 % P 2.119E+00 6.42E-01 G
                           92.38-1.696E-01 & P 2.512E+00 7.41E-01 G

AM-241       2.3714E-01
                           59.54 2.371E-01 %(P 1.089E+00 3.26E-01 G
   ( - This peak used in the nuclide activity average.

   * - Peak is too wide, but only one peak in library.
   ! - Peak is part of a multiplet and this area went
       negative during deconvolution.
   ? - Peak is too narrow.
   @ - Peak is too wide at FW25M, but ok at FWHM.
   % - Peak fails sensitivity test.
   $ - Peak identified, but first peak of this nuclide
       failed one or more qualification tests.
   + - Peak activity higher than counting uncertainty range.
   - - Peak activity lower than counting uncertainty range.
   = - Peak outside analysis energy range.
   & - Calculated peak centroid is not close enough to the
       library energy centroid for positive identification.
   P - Peakbackground subtraction
   } - Peak is too close to another for the activity
       to be found directly.

   Nuclide Codes:                      Peak Codes:
   T - Thermal Neutron Activation      G - Gamma Ray
   F - Fast Neutron Activation         X - X-Ray
   I - Fission Product                 P - Positron Decay
   N - Naturally Occurring Isotope     S - Single-Escape
   P - Photon Reaction                 D - Double-Escape
   C - Charged Particle Reaction       K - Key Line
   M - No MDA Calculation              A - Not in Average
   R - Coincidence Corrected           C - Coincidence Peak
   H - Halflife limit exceeded

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
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***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	7.2188E-02	7.7042E-02	2.9359E-01	2.9363E-01	3.098E-01
K-40		1.3827E+01	1.3827E+01	1.2800E+00	1.5109E+00	
MN-54	#A	-2.2083E-03	-2.2330E-03	3.5787E-02	3.5788E-02	3.143E-02
CO-57	#B	-8.4374E-03	-8.5467E-03	4.8281E-02	4.8283E-02	5.103E-02
CO-60	#B	9.1628E-03	9.1794E-03	3.0307E-02	3.0311E-02	3.535E-02
Sr-85	#A	-1.3167E-02	-1.3892E-02	3.9654E-02	3.9662E-02	4.185E-02
Kr-85	#A	-3.0337E+02	-3.0338E+02	8.6753E+02	8.6771E+02	9.661E+02
Y-88	#B	-9.9017E-05	-1.0230E-04	4.3910E-03	4.3910E-03	4.137E-02
NB-94	#B	-8.0764E-04	-8.0764E-04	2.5839E-02	2.5839E-02	3.067E-02
Ag-108M	#B	0.0000E+00	0.0000E+00	5.2874E-02	5.2874E-02	6.040E-02
CD-109	#A	1.3297E+00	1.3399E+00	1.6559E+00	1.6576E+00	1.786E+00
SN-113	#B	0.0000E+00	0.0000E+00	4.5962E-02	4.5962E-02	5.100E-02
SB-125	#F	1.0683E-01	1.0720E-01	7.9260E-02	7.9504E-02	1.025E-01
I-131	#B	8.6541E-03	1.3333E-02	4.5343E-02	4.5350E-02	3.305E-02
CS-134	#B	2.3443E-02	2.3551E-02	1.6552E-02	1.6609E-02	3.357E-02
CS-137	#A	3.4304E-02	3.4315E-02	3.4631E-02	3.4689E-02	3.605E-02
CE-139	#A	-7.4669E-04	-7.6580E-04	4.1918E-02	4.1918E-02	4.587E-02
EU-152	#B	-2.5451E-02	-2.5470E-02	1.4235E-01	1.4235E-01	1.456E-01
EU-154	#B	-1.5783E-02	-1.5801E-02	9.0776E-02	9.0780E-02	1.011E-01
EU-155	#B	1.5390E-01	1.5420E-01	2.1005E-01	2.1022E-01	2.286E-01
HG-203	#B	-9.4244E-03	-1.0154E-02	4.1018E-02	4.1022E-02	4.233E-02
TL-208		2.6103E-01	2.6103E-01	6.3715E-02	6.5493E-02	
PB-212		7.8446E-01	7.8446E-01	1.0913E-01	1.1826E-01	
PB-214		4.6606E-01	4.6606E-01	9.4665E-02	9.8456E-02	
BI-212		3.5111E-01	3.5111E-01	2.9121E-01	2.9192E-01	
BI-214		4.4072E-01	4.4072E-01	1.0117E-01	1.0436E-01	
RA-224	#A	8.4678E-01	8.4678E-01	9.5218E-01	9.5344E-01	1.031E+00
RA-226	#A	1.0696E+00	1.0696E+00	1.0144E+00	1.0163E+00	1.096E+00
AC-228		7.6984E-01	7.6984E-01	1.4997E-01	1.5649E-01	
TH-227	#B	-2.2655E-01	-2.2655E-01	3.6949E-01	3.6973E-01	4.048E-01
PA-234	#B	3.3556E-02	3.3556E-02	1.8130E-01	1.8131E-01	2.023E-01
TH-234	#B	-9.8181E-02	-9.8181E-02	1.2892E+01	1.2892E+01	6.764E+00
AM-241	#A	2.3713E-01	2.3714E-01	9.7850E-01	9.7858E-01	1.089E+00

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

YAEC Chemistry Lab Spectrum name: 103F_5SEPT2006_1406.An1

---------- S U M M A R Y ----------

Total Activity (1120.0 to 2000.7 keV) 1.6900032E+01 pCi/gm
Total Decayed Activity (1120.0 to 2000.7 keV) 1.6900032E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JPK

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 103F_5SEPT2006_1446.An1

Sample description
FSS-OOL-05-07-006-F

Spectrum Filename: C:\GammaVision\Spectra\103F_5SEPT2006_1446.An1

Acquisition information
Start time: 05-Sep-2006 14:47:40
Live time: 2000
Real time: 2002
Dead time: 0.09 %
Detector ID: 4

Detector system
Det 103 - DSPE-471

Calibration
Filename: D3_1LSa.Clb
Detector_103 1.0 Liter Sand Geometry

Energy Calibration
Created: 08-Aug-2005 11:09:41
Zero offset: 0.409 keV
Gain: 0.500 keV/channel
Quadratic: 1.092E-08 keV/channel^2

Efficiency Calibration
Created: 08-Aug-2005 11:11:25
Type: Polynomial
Uncertainty: 0.993 %
Coefficients: -0.264059 -5.138468 0.638383
-0.089199 0.005011 -0.000129

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.41keV)
Stop channel: 4000 (2000.67keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 1.6020E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.6020E+03) =
6.2422E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	31-Aug-2006 14:40:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	103_150K_05AUG05.Pbc 08-Aug-2005 12:54:15
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 14 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.1530

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
74.72	75.	32.43	0.99	9.100E-03	74.81	9.600	PBC<MDA	PB212
77.24	153.	17.85	0.99	1.026E-02	77.11	17.500	7.137E-01	PB212
					77.11	10.700	1.167E+00	PB214
93.16	84.	40.76	1.50	1.631E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
93.18	90.	37.51	1.50	1.645E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
129.08	110.	35.02	1.47	2.437E-02				
129.08	110.	35.02	1.47	2.437E-02	131.28	20.000	1.866E-01	PA234
186.23	93.	30.00	1.12	2.566E-02	185.99	3.280	PBC<MDA	RA226
209.38	122.	28.42	0.97	2.471E-02				
238.77	829.	4.22	1.09	2.319E-02	238.63	43.100	6.895E-01	PB212
241.84	125.	19.36	1.10	2.303E-02	241.00	3.900	1.175E+00	RA224
					241.92	7.470	6.146E-01	PB214
270.64	112.	22.59	1.25	2.149E-02				
277.57	64.	31.87	1.04	2.113E-02				
295.38	194.	11.05	1.13	2.024E-02	295.22	19.200	4.115E-01	PB214
300.15	49.	34.52	1.13	2.001E-02				
328.16	61.	29.64	0.94	1.873E-02				
338.24	206.	15.75	1.34	1.831E-02	338.40	12.010	7.864E-01	AC228
352.03	378.	6.80	1.15	1.775E-02	351.99	37.100	4.775E-01	PB214
463.52	84.	27.50	0.88	1.425E-02	463.51	10.000	4.927E-01	SB125
511.28	196.	11.99	1.30	1.316E-02	510.72	22.500	4.833E-01	TL208
583.37	265.	9.49	1.45	1.184E-02	583.14	86.000	2.155E-01	TL208
609.52	289.	8.35	1.31	1.144E-02	609.32	46.090	4.514E-01	BI214
661.82	396.	6.91	1.38	1.072E-02	661.62	84.620	3.670E-01	CS137
727.19	84.	22.23	1.80	9.965E-03	727.17	11.800	6.019E-01	BI212

911.41	224.	9.38	1.59	8.399E-03	911.07	29.000	7.656E-01	AC228
964.30	36.	30.33	1.54	8.055E-03	964.00	14.580	PBC<MDA	EU152
969.44	109.	12.23	1.54	8.024E-03	968.90	17.460	6.570E-01	AC228
1120.65	96.	20.89	0.87	7.210E-03	1120.28	15.040	7.350E-01	BI214
1461.20	1115.	3.04	1.89	5.931E-03	1460.75	10.700	1.457E+01	K40

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
1765.01	68.	13.48	2.05	5.141E-03	1764.51	15.920	6.691E-01	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
417.93	209.38	432.	122.	0.061	85.25	0.974	AC-228	s
540.44	270.64	218.	112.	0.056	67.78	1.249	AC-228	s
554.30	277.57	170.	64.	0.032	93.66	1.040	NP-239	
599.44	300.14	121.	49.	0.025	103.55	1.131	PB-212	lD
655.47	328.16	133.	61.	0.031	88.93	0.942	AC-228	
1927.26	964.12	49.	36.	0.018	97.41	0.840	EU-152	sM

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.
M - Peak is close to a library peak.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-212	148.79	74.81	306.	73.	0.037	102.35	0.993D
PB-212	153.39	77.11	319.	94.	0.047	86.50	0.995A
PA-234	257.18	129.01	476.	94.	0.047	102.08	1.500s
RA-226	372.01	186.42	511.	134.	0.067	69.23	1.500
PB-212	476.69	238.77	527.	759.	0.379	17.44	1.019
RA-224	481.94	241.39	601.	113.	0.056	96.42	1.500
PB-214	482.76	241.80	293.	65.	0.033	111.98	1.077
PB-214	589.90	295.38	250.	184.	0.092	44.63	1.289
AC-228	675.62	338.24	274.	205.	0.102	47.24	1.337s
PB-214	703.20	352.03	129.	373.	0.186	20.40	1.147
SB-125	926.14	463.51	163.	55.	0.028	103.24	1.500D
TL-208	1021.67	511.28	150.	170.	0.085	35.96	1.302s
TL-208	1165.84	583.37	119.	260.	0.130	28.47	1.449
BI-214	1218.14	609.52	111.	282.	0.141	25.05	1.306
CS-137	1322.72	661.82	111.	395.	0.197	20.72	1.384
BI-212	1453.45	727.19	84.	84.	0.042	66.68	1.803s
AC-228	1821.86	911.41	66.	221.	0.111	28.13	1.588s
AC-228	1935.72	968.35	84.	178.	0.089	39.74	1.896s
BI-214	2240.26	1120.65	75.	95.	0.047	62.67	0.871s
K-40	2921.27	1461.20	27.	1097.	0.548	9.12	1.885
BI-214	3528.77	1765.01	8.	65.	0.032	40.44	2.054

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	MDA Value pCi/gm	COMMENTS
BE-7		6.6896E-03					
			477.56	6.690E-03	%(	3.869E-01 1.12E-01	G
K-40		1.4573E+01					
			1460.75	1.457E+01	(P	3.603E-01 4.51E-01	G
MN-54		-7.9673E-03					
			834.81	-7.967E-03	&(P	4.067E-02 1.18E-02	G
CO-57		2.2002E-02					
			122.07	2.200E-02	%(P	5.162E-02 1.56E-02	G K
			136.43	6.166E-02	&	4.095E-01 1.22E-01	G
CO-60		1.0595E-02					
			1332.51	1.059E-02	%(P	3.835E-02 1.10E-02	G K
			1173.23	2.058E-02	% P	5.379E-02 1.60E-02	G K
Sr-85		-1.0873E-02					
			514.00	-1.087E-02	%(	5.062E-02 1.50E-02	G
Kr-85		-2.3890E+02					
			513.99	-2.389E+02	%(	1.108E+03 3.29E+02	G
Y-88		-3.0680E-03					
			1836.01	-3.068E-03	%(P	2.516E-02 6.57E-03	G K
			898.02	-6.895E-04	% P	5.244E-02 1.50E-02	G
NB-94		-8.5779E-03					
			871.10	-8.578E-03	%(	3.909E-02 1.14E-02	G K
			702.50	-5.968E-04	&	3.253E-02 9.22E-03	G K
Ag-108M		-1.8207E-03					
			722.95	-1.821E-03	%(	4.490E-02 1.29E-02	G K
			614.37	-1.296E-02	% P	4.494E-02 1.34E-02	G
			433.93	3.404E-03	%	3.824E-02 1.12E-02	G
CD-109		1.2352E+00					
			88.04	1.235E+00	%(	1.937E+00 5.92E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SN-113	1.6356E-02						
		391.71	1.636E-02	%(	5.395E-02	1.61E-02	G K
		255.04	-2.675E-01	&	1.724E+00	5.13E-01	G
SB-125	1.1034E-01						
		427.95	3.656E-02	&(P	1.037E-01	3.10E-02	G K
		600.77	4.877E-02	% P	1.650E-01	4.88E-02	G
		636.15	-5.651E-02	% P	3.283E-01	9.56E-02	G
							Energy duplication
		463.51	3.288E-01	*(P	3.693E-01	1.16E-01	G
		176.29	1.343E-01	%	5.307E-01	1.59E-01	G
I-131	-4.8040E-03						
		364.48	-4.804E-03	&(P	6.697E-02	1.96E-02	G K
		636.97	-2.824E-02	&	6.091E-01	1.73E-01	G
		284.29	1.274E-01	& P	7.971E-01	2.36E-01	G
CS-134	-1.9091E-02						
		604.66	-1.909E-02	%(	4.331E-02	1.31E-02	G K
		795.76	2.379E-02	% P	3.757E-02	1.17E-02	G
		569.29	-3.835E-02	& P	2.312E-01	6.70E-02	G
		801.84	-8.844E-02	% P	3.970E-01	1.14E-01	G
CS-137	3.6699E-01						
		661.62	3.670E-01	(P	4.826E-02	2.54E-02	G
CE-139	-7.6645E-03						
		165.85	-7.665E-03	%(	4.991E-02	1.49E-02	G
EU-152	6.3014E-02						
		121.78	6.301E-02	%(P	1.496E-01	4.52E-02	G K
		344.30	-2.326E-02	% P	1.211E-01	3.59E-02	G
		1408.08	9.233E-02	%	1.526E-01	4.77E-02	G
		964.00	-1.176E-02	% P	4.268E-01	1.24E-01	G
		1112.07	-3.246E-02	%	3.252E-01	9.32E-02	G
		778.90	2.063E-02	%	2.623E-01	7.49E-02	G
EU-154	4.4082E-02						
		123.10	4.408E-02	%(	1.014E-01	3.07E-02	G K
		1274.80	9.156E-03	&	8.912E-02	2.47E-02	G
		723.30	-1.298E-02	&	2.087E-01	6.03E-02	G
		1004.80	0.000E+00	%	2.294E-01	6.46E-02	G
EU-155	2.1283E-02						
		86.45	2.128E-02	&(	2.105E-01	6.27E-02	G K
		105.31	8.834E-02	%	2.271E-01	6.86E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
HG-203	-2.0425E-05						
		279.17	-2.042E-05	&(P	4.500E-02	1.32E-02	G K
		72.87	2.101E-02	% P	2.403E+00	7.15E-01	G
		70.83	1.788E-01	%	4.749E+00	1.41E+00	G
		82.50	-2.835E-01	&	4.383E+00	1.31E+00	G
TL-208	2.1555E-01						
		583.14	2.155E-01	(P	4.429E-02	2.08E-02	G
		510.72	4.833E-01	+ P	1.702E-01	6.71E-02	G
PB-212	6.6875E-01						
		238.63	6.402E-01	(P	9.255E-02	3.78E-02	G K
							Energy duplication
		77.11	4.467E-01	} P	4.096E-01	1.29E-01	G
		74.81	7.130E-01	(P	8.174E-01	2.53E-01	G
PB-214	4.7754E-01						
		351.99	4.775E-01	(P	7.129E-02	3.30E-02	G K
		295.22	3.983E-01	- P	1.659E-01	6.06E-02	G
							Energy duplication
		77.11	3.386E-01	} P	1.012E+00	2.33E-01	G
		241.92	3.198E-01	-	4.044E-01	1.19E-01	G
BI-212	6.0193E-01						
		727.17	6.019E-01	*(P	3.260E-01	1.35E-01	G K
		1620.56	9.332E-02	% P	1.126E+00	3.04E-01	G
		785.42	6.034E-01	%	1.905E+00	5.66E-01	G
BI-214	4.5139E-01						
		609.32	4.514E-01	(P	8.284E-02	3.86E-02	G K
		1764.51	6.691E-01	+ P	1.644E-01	9.48E-02	G
		1120.28	7.350E-01	+ P	3.360E-01	1.57E-01	G
RA-224	1.0575E+00						
		241.00	1.058E+00	&(	1.096E+00	3.40E-01	G
RA-226	1.3381E+00						
		185.99	1.338E+00	(P	1.083E+00	3.39E-01	G
AC-228	7.7171E-01						
		911.07	7.656E-01	@(P	1.403E-01	7.29E-02	G K
		968.90	1.071E+00	+ P	2.736E-01	1.42E-01	G
		338.40	7.864E-01	*(P	3.065E-01	1.24E-01	G
TH-227	-2.2518E-02						
		236.00	-2.252E-02	%(	3.993E-01	1.19E-01	G K
		256.25	1.096E-01	& P	4.964E-01	1.48E-01	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments

PA-234       7.0769E-02
                           98.44-1.728E-03 &(P 1.795E-01 5.29E-02 G K
                          946.00-4.922E-02 % P 2.036E-01 5.97E-02 G
                          131.28 1.618E-01 &(P 1.788E-01 5.54E-02 G
                           94.67-1.077E-01 & P 4.454E-01 1.34E-01 G
                          883.24 6.925E-03 %   2.731E-01 7.65E-02 G
                          926.70-1.575E-04 &   2.627E-01 7.21E-02 G
                          569.26-5.849E-02 & P 3.419E-01 9.91E-02 G

TH-234       6.6652E-01
                           63.29 6.665E-01 %(P 6.612E+00 1.96E+00 G K
                           92.80 1.542E+00 % P 2.275E+00 6.92E-01 G
                           92.38 1.682E+00 % P 2.737E+00 8.30E-01 G

AM-241       2.2880E-02
                           59.54 2.288E-02 %(P 1.079E+00 3.19E-01 G
   ( - This peak used in the nuclide activity average.

   * - Peak is too wide, but only one peak in library.
   ! - Peak is part of a multiplet and this area went
       negative during deconvolution.
   ? - Peak is too narrow.
   @ - Peak is too wide at FW25M, but ok at FWHM.
   % - Peak fails sensitivity test.
   $ - Peak identified, but first peak of this nuclide
       failed one or more qualification tests.
   + - Peak activity higher than counting uncertainty range.
   - - Peak activity lower than counting uncertainty range.
   = - Peak outside analysis energy range.
   & - Calculated peak centroid is not close enough to the
       library energy centroid for positive identification.
   P - Peakbackground subtraction
   } - Peak is too close to another for the activity
       to be found directly.

   Nuclide Codes:                      Peak Codes:
   T - Thermal Neutron Activation      G - Gamma Ray
   F - Fast Neutron Activation         X - X-Ray
   I - Fission Product                 P - Positron Decay
   N - Naturally Occurring Isotope     S - Single-Escape
   P - Photon Reaction                 D - Double-Escape
   C - Charged Particle Reaction       K - Key Line
   M - No MDA Calculation              A - Not in Average
   R - Coincidence Corrected           C - Coincidence Peak
   H - Halflife limit exceeded

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
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***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	6.2688E-03	6.6896E-03	3.3732E-01	3.3732E-01	3.626E-01
K-40		1.4573E+01	1.4573E+01	1.3516E+00	1.5946E+00	
MN-54	#A	-7.8793E-03	-7.9673E-03	3.8702E-02	3.8705E-02	4.023E-02
CO-57	#B	2.1721E-02	2.2002E-02	4.6845E-02	4.6861E-02	5.096E-02
CO-60	#B	1.0576E-02	1.0595E-02	3.2947E-02	3.2952E-02	3.829E-02
Sr-85	#A	-1.0306E-02	-1.0873E-02	4.5147E-02	4.5151E-02	4.798E-02
Kr-85	#A	-2.3890E+02	-2.3890E+02	9.8815E+02	9.8825E+02	1.108E+03
Y-88	#B	-2.9698E-03	-3.0680E-03	2.1172E-02	2.1173E-02	2.435E-02
NB-94	#B	-8.5779E-03	-8.5779E-03	3.4304E-02	3.4308E-02	3.909E-02
Ag-108M	#B	-1.8206E-03	-1.8207E-03	3.8774E-02	3.8774E-02	4.489E-02
CD-109	#A	1.2258E+00	1.2352E+00	1.7746E+00	1.7759E+00	1.922E+00
SN-113	#B	1.5871E-02	1.6356E-02	4.8352E-02	4.8361E-02	5.235E-02
SB-125	#F	1.0997E-01	1.1034E-01	1.1654E-01	1.1672E-01	1.033E-01
I-131	#B	-3.1203E-03	-4.8040E-03	7.6776E-02	7.6777E-02	4.350E-02
CS-134	#B	-1.9004E-02	-1.9091E-02	3.9257E-02	3.9273E-02	4.311E-02
CS-137		3.6688E-01	3.6699E-01	7.6306E-02	7.9225E-02	
CE-139	#A	-7.4736E-03	-7.6645E-03	4.4741E-02	4.4743E-02	4.867E-02
EU-152	#B	6.2967E-02	6.3014E-02	1.3575E-01	1.3579E-01	1.495E-01
EU-154	#B	4.4033E-02	4.4082E-02	9.2056E-02	9.2089E-02	1.013E-01
EU-155	#B	2.1243E-02	2.1283E-02	1.8803E-01	1.8804E-01	2.101E-01
HG-203	#B	-1.8959E-05	-2.0425E-05	3.0587E-03	3.0587E-03	4.177E-02
TL-208		2.1555E-01	2.1555E-01	6.2389E-02	6.3632E-02	
PB-212		6.6875E-01	6.6875E-01	1.1845E-01	1.2465E-01	
PB-214		4.7754E-01	4.7754E-01	9.8899E-02	1.0271E-01	
BI-212	#	6.0193E-01	6.0193E-01	4.0374E-01	4.0525E-01	
BI-214		4.5139E-01	4.5139E-01	1.1569E-01	1.1862E-01	
RA-224	#A	1.0575E+00	1.0575E+00	1.0197E+00	1.0216E+00	1.096E+00
RA-226	#	1.3381E+00	1.3381E+00	1.0162E+00	1.0191E+00	1.083E+00
AC-228	#	7.7171E-01	7.7171E-01	2.1384E-01	2.1849E-01	
TH-227	#B	-2.2518E-02	-2.2518E-02	3.5647E-01	3.5647E-01	3.993E-01
PA-234	#B	7.0769E-02	7.0769E-02	7.2722E-02	7.2828E-02	1.795E-01
TH-234	#B	6.6652E-01	6.6652E-01	5.8931E+00	5.8933E+00	6.612E+00
AM-241	#A	2.2880E-02	2.2880E-02	9.5782E-01	9.5782E-01	1.079E+00

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (87.4 to 2000.7 keV) 1.8127125E+01 pCi/gm
Total Decayed Activity (87.4 to 2000.7 keV) 1.8127243E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JPK

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 103F_5SEPT2006_1536.An1

Sample description
FSS-OOL-05-07-002-F

Spectrum Filename: C:\GammaVision\Spectra\103F_5SEPT2006_1536.An1

Acquisition information
Start time: 05-Sep-2006 15:36:36
Live time: 2000
Real time: 2001
Dead time: 0.07 %
Detector ID: 4

Detector system
Det 103 - DSPE-471

Calibration
Filename: D3_1LSa.Clb
Detector_103 1.0 Liter Sand Geometry

Energy Calibration
Created: 08-Aug-2005 11:09:41
Zero offset: 0.409 keV
Gain: 0.500 keV/channel
Quadratic: 1.092E-08 keV/channel^2

Efficiency Calibration
Created: 08-Aug-2005 11:11:25
Type: Polynomial
Uncertainty: 0.993 %
Coefficients: -0.264059 -5.138468 0.638383
-0.089199 0.005011 -0.000129

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.41keV)
Stop channel: 4000 (2000.67keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 1.1470E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.1470E+03) =
8.7184E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	31-Aug-2006 13:32:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	103_150K_05AUG05.Pbc 08-Aug-2005 12:54:15
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 16 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.1796

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
74.95	94.	22.00	0.99	9.052E-03	74.81	9.600	1.269E+00	PB212
77.25	93.	20.18	0.99	1.011E-02	77.11	10.700	1.274E+00	PB214
					77.11	17.500	7.793E-01	PB212
186.68	141.	21.08	0.92	2.564E-02	185.99	3.280	1.792E+00	RA226
238.82	582.	4.90	1.09	2.319E-02	238.63	43.100	6.713E-01	PB212
241.77	116.	17.23	1.09	2.303E-02	241.00	3.900	1.523E+00	RA224
					241.92	7.470	7.968E-01	PB214
295.36	164.	12.35	1.06	2.024E-02	295.22	19.200	4.856E-01	PB214
300.39	48.	39.92	0.92	2.000E-02				
338.45	146.	16.82	0.85	1.830E-02	338.40	12.010	7.778E-01	AC228
352.03	293.	7.79	1.19	1.775E-02	351.99	37.100	5.137E-01	PB214
510.92	130.	13.76	1.74	1.317E-02	510.72	22.500	4.123E-01	TL208
583.40	208.	10.42	0.89	1.184E-02	583.14	86.000	2.351E-01	TL208
609.49	223.	9.14	1.23	1.144E-02	609.32	46.090	4.830E-01	BI214
661.84	316.	7.26	1.42	1.072E-02	661.62	84.620	4.087E-01	CS137
727.51	68.	17.47	1.52	9.961E-03	727.17	11.800	6.814E-01	BI212
795.25	41.	34.76	1.03	9.306E-03				
795.25	41.	34.76	1.03	9.306E-03	795.76	85.400	6.052E-02	CS134
861.38	50.	30.85	1.23	8.761E-03				
911.48	141.	10.92	1.40	8.398E-03	911.07	29.000	6.646E-01	AC228
968.69	121.	14.67	0.91	8.027E-03	968.90	17.460	1.019E+00	AC228
1120.64	55.	22.54	2.07	7.212E-03	1120.28	15.040	5.986E-01	BI214
1461.32	730.	3.85	1.97	5.930E-03	1460.75	10.700	1.320E+01	K40
1765.20	39.	15.43	2.54	5.142E-03	1764.51	15.920	5.574E-01	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide
599.93	300.39	133.	48.	0.024	119.77	0.925	PB-212
1721.80	861.38	52.	50.	0.025	92.56	1.228	TL-208

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-212	148.79	74.81	181.	94.	0.047	66.01	0.993D
PB-212	153.39	77.11	217.	93.	0.046	60.53	0.995A
RA-226	371.80	186.32	387.	113.	0.056	70.53	1.500s
PB-212	476.85	238.84	466.	525.	0.262	23.17	1.025
RA-224	483.06	241.95	394.	105.	0.053	85.31	1.500
PB-214	482.84	241.84	470.	78.	0.039	123.00	1.500
PB-214	589.86	295.36	122.	160.	0.080	37.04	1.059
AC-228	676.04	338.45	165.	145.	0.073	50.47	0.850
PB-214	703.19	352.03	109.	287.	0.144	23.36	1.193
TL-208	1020.96	510.92	100.	104.	0.052	41.27	1.737s
TL-208	1165.90	583.40	86.	203.	0.102	31.26	0.887
BI-214	1218.08	609.49	75.	216.	0.108	27.43	1.230
CS-137	1322.77	661.84	61.	315.	0.157	21.77	1.420
BI-212	1454.10	727.51	33.	68.	0.034	52.42	1.521s
CS-134	1589.73	795.34	34.	26.	0.013	111.85	1.500s
AC-228	1821.98	911.48	38.	137.	0.069	32.77	1.403
AC-228	1936.39	968.69	58.	121.	0.061	44.01	0.911s
BI-214	2240.25	1120.64	38.	55.	0.028	67.61	2.074s
K-40	2921.50	1461.32	34.	711.	0.356	11.55	1.970
BI-214	3529.15	1765.20	3.	39.	0.019	46.29	2.536s

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	MDA Value pCi/gm	COMMENTS
BE-7		1.5363E-01					
			477.56	1.536E-01	%(	3.503E-01 1.06E-01	G
K-40		1.3203E+01					
			1460.75	1.320E+01	(P	5.526E-01 5.22E-01	G
MN-54		-1.4903E-04					
			834.81	-1.490E-04	&(P	4.333E-02 1.20E-02	G
CO-57		-1.4071E-02					
			122.07	-1.407E-02	%(P	6.321E-02 1.89E-02	G K
			136.43	-1.033E-01	%	4.800E-01 1.44E-01	G
CO-60		-1.5465E-02					
			1332.51	-1.546E-02	%(P	5.431E-02 1.50E-02	G K
			1173.23	-3.300E-03	% P	5.840E-02 1.60E-02	G K
Sr-85		-2.8715E-02					
			514.00	-2.871E-02	%(	6.383E-02 1.93E-02	G
Kr-85		-6.2801E+02					
			513.99	-6.280E+02	%(	1.396E+03 4.22E+02	G
Y-88		-6.0521E-03					
			1836.01	-6.052E-03	%(P	4.193E-02 1.13E-02	G K
			898.02	2.209E-03	& P	3.253E-02 8.73E-03	G
NB-94		-4.4138E-03					
			871.10	-4.414E-03	&(	3.798E-02 1.07E-02	G K
			702.50	-1.225E-03	%	5.216E-02 1.49E-02	G K
Ag-108M		4.9003E-04					
			722.95	4.900E-04	%(	4.423E-02 1.24E-02	G K
			614.37	-1.366E-02	% P	4.886E-02 1.44E-02	G
			433.93	1.158E-03	%	3.927E-02 1.12E-02	G
CD-109		-6.0334E-01					
			88.04	-6.033E-01	%(	2.549E+00 7.65E-01	G
SN-113		-1.5545E-02					
			391.71	-1.555E-02	&(	7.167E-02 2.12E-02	G K
			255.04	3.695E-01	%	1.827E+00 5.42E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	8.2980E-03						
		427.95	8.298E-03	&(P	1.473E-01	4.28E-02	G K
		600.77	3.019E-02	% P	2.429E-01	7.03E-02	G
		636.15	-1.632E-01	% P	4.248E-01	1.27E-01	G
		463.51	1.487E-01	& P	4.272E-01	1.27E-01	G
		176.29	1.064E-01	%	7.046E-01	2.10E-01	G
I-131	1.0203E-02						
		364.48	1.020E-02	%(P	7.219E-02	2.11E-02	G K
		636.97	-3.044E-01	&	8.761E-01	2.61E-01	G
		284.29	-2.816E-02	% P	1.092E+00	3.20E-01	G
CS-134	1.3145E-02						
		604.66	-8.969E-03	%(	5.254E-02	1.54E-02	G K
		795.76	3.842E-02	@(P	4.433E-02	1.44E-02	G
		569.29	2.696E-02	& P	2.709E-01	7.76E-02	G
		801.84	-2.216E-02	% P	4.647E-01	1.26E-01	G
CS-137	4.0866E-01						
		661.62	4.087E-01	(P	5.095E-02	2.98E-02	G
CE-139	-8.3430E-03						
		165.85	-8.343E-03	&(	5.576E-02	1.66E-02	G
EU-152	-3.0603E-02						
		121.78	-3.060E-02	%(P	1.815E-01	5.41E-02	G K
		344.30	-2.041E-04	& P	1.402E-01	4.05E-02	G
		1408.08	8.961E-03	%	2.196E-01	5.98E-02	G
		964.00	2.317E-01	% P	4.048E-01	1.24E-01	G
		1112.07	-2.068E-02	&	3.444E-01	9.60E-02	G
		778.90	4.739E-02	%	2.689E-01	7.67E-02	G
EU-154	-3.0142E-02						
		123.10	-3.014E-02	%(	1.354E-01	4.05E-02	G K
		1274.80	0.000E+00	%	1.592E-01	4.42E-02	G
		723.30	-1.010E-01	%	2.642E-01	7.92E-02	G
		1004.80	-9.470E-04	&	2.537E-01	7.00E-02	G
EU-155	1.3942E-01						
							Energy duplication
		86.45	1.394E-01	%(	2.825E-01	8.57E-02	G K
		105.31	2.719E-02	%	2.543E-01	7.55E-02	G
HG-203	1.9020E-02						
		279.17	1.902E-02	%(P	5.453E-02	1.64E-02	G K
		72.87	-8.974E-01	% P	2.785E+00	8.37E-01	G
		70.83	-2.827E+00	%	5.538E+00	1.68E+00	G
		82.50	-1.447E+00	%	5.075E+00	1.52E+00	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments

TL-208       2.3513E-01
                          583.14 2.351E-01  (P 5.303E-02 2.50E-02 G
                          510.72 4.123E-01 + P 1.963E-01 7.13E-02 G

PB-212       6.1819E-01
                          238.63 6.182E-01  (P 1.218E-01 4.89E-02 G K
                                                          Energy duplication
                           77.11 6.182E-01 } P 4.749E-01 1.25E-01 G
                           74.81 1.269E+00 + P 8.871E-01 2.88E-01 G

PB-214       5.0749E-01
                          351.99 5.137E-01  (P 9.181E-02 4.08E-02 G K
                          295.22 4.856E-01  (P 1.640E-01 6.15E-02 G
                                                          Energy duplication
                           77.11 2.199E-01 } P 1.074E+00 2.77E-01 G
                          241.92 5.330E-01  (  7.106E-01 2.19E-01 G

BI-212       6.8140E-01
                          727.17 6.814E-01 *(P 2.954E-01 1.20E-01 G K
                         1620.56 3.004E-01 % P 9.331E-01 2.67E-01 G
                          785.42 7.847E-01 %   1.781E+00 5.37E-01 G

BI-214       5.2091E-01
                          609.32 4.830E-01  (P 9.616E-02 4.55E-02 G K
                         1764.51 5.574E-01  (P 1.603E-01 9.33E-02 G
                         1120.28 5.986E-01 *(P 3.410E-01 1.40E-01 G

RA-224       1.3762E+00
                          241.00 1.376E+00 &(  1.247E+00 3.91E-01 G

RA-226       1.5773E+00
                          185.99 1.577E+00 @(P 1.320E+00 4.13E-01 G

AC-228       6.9775E-01
                          911.07 6.646E-01  (P 1.512E-01 7.44E-02 G K
                          968.90 1.019E+00 + P 3.205E-01 1.50E-01 G
                          338.40 7.778E-01  (P 3.353E-01 1.32E-01 G

TH-227      -5.1580E-02
                          236.00-5.158E-02 %(  4.792E-01 1.43E-01 G K
                          256.25 1.245E-01 % P 4.859E-01 1.44E-01 G

PA-234      -1.6717E-03
                           98.44-1.672E-03 %(P 2.278E-01 6.69E-02 G K
                          946.00 7.020E-02 % P 2.111E-01 6.23E-02 G
                          131.28-6.605E-03 % P 2.507E-01 7.42E-02 G
                           94.67-1.099E-02 % P 4.765E-01 1.41E-01 G
                          883.24-5.658E-02 %   3.413E-01 9.76E-02 G
                          926.70-1.205E-02 %   3.518E-01 9.69E-02 G
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 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26 3.254E-02 & P 4.103E-01 1.17E-01 G

TH-234       1.6284E+00
                           63.29 1.628E+00 %(P 7.467E+00 2.22E+00 G K
                           92.80 1.316E+00 % P 2.562E+00 7.72E-01 G
                           92.38 1.528E+00 % P 3.049E+00 9.18E-01 G

AM-241      -1.8229E-02
                           59.54-1.823E-02 &(P 1.449E+00 4.28E-01 G
   ( - This peak used in the nuclide activity average.

   * - Peak is too wide, but only one peak in library.
   ! - Peak is part of a multiplet and this area went
       negative during deconvolution.
   ? - Peak is too narrow.
   @ - Peak is too wide at FW25M, but ok at FWHM.
   % - Peak fails sensitivity test.
   $ - Peak identified, but first peak of this nuclide
       failed one or more qualification tests.
   + - Peak activity higher than counting uncertainty range.
   - - Peak activity lower than counting uncertainty range.
   = - Peak outside analysis energy range.
   & - Calculated peak centroid is not close enough to the
       library energy centroid for positive identification.
   P - Peakbackground subtraction
   } - Peak is too close to another for the activity
       to be found directly.

   Nuclide Codes:                      Peak Codes:
   T - Thermal Neutron Activation      G - Gamma Ray
   F - Fast Neutron Activation         X - X-Ray
   I - Fission Product                 P - Positron Decay
   N - Naturally Occurring Isotope     S - Single-Escape
   P - Photon Reaction                 D - Double-Escape
   C - Charged Particle Reaction       K - Key Line
   M - No MDA Calculation              A - Not in Average
   R - Coincidence Corrected           C - Coincidence Peak
   H - Halflife limit exceeded

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
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***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	1.4382E-01	1.5363E-01	3.1699E-01	3.1712E-01	3.279E-01
K-40		1.3203E+01	1.3203E+01	1.5651E+00	1.7428E+00	
MN-54	#A	-1.4735E-04	-1.4903E-04	6.9022E-02	6.9022E-02	4.285E-02
CO-57	#B	-1.3888E-02	-1.4071E-02	5.8820E-02	5.8825E-02	6.239E-02
CO-60	#B	-1.5436E-02	-1.5465E-02	8.6977E-02	8.6981E-02	5.421E-02

Sr-85	#A	-2.7195E-02	-2.8715E-02	5.7927E-02	5.7951E-02	6.045E-02
Kr-85	#A	-6.2798E+02	-6.2801E+02	1.2666E+03	1.2671E+03	1.396E+03
Y-88	#B	-5.8552E-03	-6.0521E-03	3.5765E-02	3.5766E-02	4.057E-02
NB-94	#B	-4.4137E-03	-4.4138E-03	3.2082E-02	3.2083E-02	3.798E-02
Ag-108M	#B	4.8999E-04	4.9003E-04	3.7133E-02	3.7133E-02	4.422E-02
CD-109	#A	-5.9866E-01	-6.0334E-01	2.2939E+00	2.2942E+00	2.530E+00
SN-113	#B	-1.5076E-02	-1.5545E-02	6.3676E-02	6.3683E-02	6.951E-02
SB-125	#B	8.2691E-03	8.2980E-03	1.2841E-01	1.2841E-01	1.468E-01
I-131	#B	6.5806E-03	1.0203E-02	6.3376E-02	6.3379E-02	4.656E-02
CS-134	#B	1.3084E-02	1.3145E-02	1.4753E-02	1.4773E-02	5.229E-02
CS-137		4.0853E-01	4.0866E-01	8.9372E-02	9.2468E-02	
CE-139	#A	-8.1318E-03	-8.3430E-03	4.9776E-02	4.9779E-02	5.435E-02
EU-152	#B	-3.0579E-02	-3.0603E-02	1.8064E-01	1.8065E-01	1.813E-01
EU-154	#B	-3.0108E-02	-3.0142E-02	1.2159E-01	1.2160E-01	1.352E-01
EU-155	#B	1.3915E-01	1.3942E-01	2.5721E-01	2.5732E-01	2.820E-01
HG-203	#B	1.7634E-02	1.9020E-02	4.9125E-02	4.9137E-02	5.056E-02
TL-208		2.3513E-01	2.3513E-01	7.5069E-02	7.6300E-02	
PB-212		6.1819E-01	6.1819E-01	1.4652E-01	1.5085E-01	
PB-214		5.0749E-01	5.0749E-01	1.2088E-01	1.2442E-01	
BI-212	#	6.8140E-01	6.8140E-01	3.5977E-01	3.6194E-01	
BI-214		5.2091E-01	5.2091E-01	1.4714E-01	1.5022E-01	
RA-224	#	1.3762E+00	1.3762E+00	1.1740E+00	1.1768E+00	1.247E+00
RA-226	#	1.5773E+00	1.5773E+00	1.2404E+00	1.2438E+00	1.320E+00
AC-228		6.9775E-01	6.9775E-01	2.1257E-01	2.1640E-01	
TH-227	#B	-5.1580E-02	-5.1580E-02	4.2766E-01	4.2767E-01	4.792E-01
PA-234	#B	-1.6717E-03	-1.6717E-03	9.7058E-01	9.7058E-01	2.278E-01
TH-234	#B	1.6284E+00	1.6284E+00	6.6646E+00	6.6653E+00	7.467E+00
AM-241	#A	-1.8228E-02	-1.8229E-02	1.7637E+00	1.7637E+00	1.449E+00

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (86.4 to 2000.7 keV) 1.6872007E+01 pCi/gm
Total Decayed Activity (86.4 to 2000.7 keV) 1.6872139E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JPK

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 103F_5SEPT2006_1614.An1

Sample description
FSS-OOL-05-07-002-F-RC

Spectrum Filename: C:\GammaVision\Spectra\103F_5SEPT2006_1614.An1

Acquisition information
Start time: 05-Sep-2006 16:14:01
Live time: 2000
Real time: 2001
Dead time: 0.07 %
Detector ID: 4

Detector system
Det 103 - DSPE-471

Calibration
Filename: D3_1LSa.Clb
Detector_103 1.0 Liter Sand Geometry

Energy Calibration
Created: 08-Aug-2005 11:09:41
Zero offset: 0.409 keV
Gain: 0.500 keV/channel
Quadratic: 1.092E-08 keV/channel^2

Efficiency Calibration
Created: 08-Aug-2005 11:11:25
Type: Polynomial
Uncertainty: 0.993 %
Coefficients: -0.264059 -5.138468 0.638383
-0.089199 0.005011 -0.000129

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.41keV)
Stop channel: 4000 (2000.67keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 1.1470E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.1470E+03) =
8.7184E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	31-Aug-2006 13:32:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	103_150K_05AUG05.Pbc 08-Aug-2005 12:54:15
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 16 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.1879

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
74.93	99.	22.10	0.99	9.052E-03	74.81	9.600	1.348E+00	PB212
77.23	81.	22.78	0.99	1.011E-02	77.11	10.700	1.229E+00	PB214
					77.11	17.500	7.517E-01	PB212
93.44	87.	35.93	1.90	1.667E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
					94.67	15.500	PBC<MDA	PA234
186.20	104.	29.79	1.29	2.566E-02	185.99	3.280	PBC<MDA	RA226
238.81	566.	5.02	1.09	2.319E-02	238.63	43.100	6.529E-01	PB212
241.80	80.	23.87	1.09	2.303E-02	241.00	3.900	1.041E+00	RA224
					241.92	7.470	5.448E-01	PB214
295.29	180.	13.34	0.83	2.025E-02	295.22	19.200	5.317E-01	PB214
300.61	56.	31.61	1.51	1.999E-02				
338.75	145.	15.04	1.11	1.829E-02	338.40	12.010	7.692E-01	AC228
352.01	300.	9.23	1.20	1.775E-02	351.99	37.100	5.274E-01	PB214
462.33	42.	32.15	1.01	1.428E-02				
462.33	42.	32.15	1.01	1.428E-02	463.51	10.000	PBC<MDA	SB125
511.02	102.	17.88	1.23	1.317E-02	510.72	22.500	3.002E-01	TL208
583.33	199.	11.46	1.39	1.184E-02	583.14	86.000	2.247E-01	TL208
609.48	240.	8.27	1.37	1.144E-02	609.32	46.090	5.214E-01	BI214
661.97	339.	7.87	1.39	1.072E-02	661.62	84.620	4.385E-01	CS137
727.52	45.	25.29	2.18	9.965E-03	727.17	11.800	4.519E-01	BI212
836.57	37.	27.80	1.21	8.956E-03				
860.45	44.	24.85	1.18	8.768E-03				
911.56	163.	11.94	1.09	8.398E-03	911.07	29.000	7.710E-01	AC228
968.98	94.	17.39	1.32	8.025E-03	968.90	17.460	7.857E-01	AC228
1120.86	54.	22.22	1.67	7.209E-03	1120.28	15.040	5.660E-01	BI214
1461.34	741.	3.72	2.10	5.930E-03	1460.75	10.700	1.341E+01	K40

1764.98	45.	14.91	1.07	5.141E-03	1764.51	15.920	6.006E-01	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide
600.36	300.61	122.	56.	0.028	94.84	1.511	PB-212 s
923.78	462.33	62.	42.	0.021	96.45	1.006	CS-138 l
1719.94	860.45	27.	44.	0.022	74.56	1.176	TL-208

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-212	148.79	74.81	209.	99.	0.050	66.29	0.993D
PB-212	153.39	77.11	205.	81.	0.041	68.35	0.995A
RA-226	371.69	186.26	359.	101.	0.050	74.82	1.500s
PB-212	476.66	238.75	373.	458.	0.229	23.35	0.990
PB-214	482.64	241.74	177.	50.	0.025	114.71	0.632s
PB-214	589.72	295.29	162.	175.	0.088	40.02	0.832
AC-228	676.65	338.75	127.	144.	0.072	45.13	1.112
PB-214	703.17	352.01	167.	295.	0.147	27.68	1.202
TL-208	1021.15	511.02	109.	76.	0.038	53.65	1.234s
TL-208	1165.75	583.33	91.	194.	0.097	34.39	1.389s
BI-214	1218.05	609.48	66.	233.	0.117	24.82	1.372
CS-137	1323.02	661.97	99.	338.	0.169	23.60	1.386
BI-212	1454.11	727.52	37.	45.	0.023	75.86	2.180s
AC-228	1822.14	911.56	55.	159.	0.080	35.82	1.091s
AC-228	1936.98	968.98	51.	93.	0.047	52.17	1.322
BI-214	2240.69	1120.86	38.	52.	0.026	66.67	1.675s
K-40	2921.54	1461.34	22.	723.	0.361	11.15	2.097
BI-214	3528.54	1764.89	2.	22.	0.011	55.72	2.033s

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	MDA Value pCi/gm	COMMENTS
BE-7		1.9044E-01					
			477.56	1.904E-01	%(	4.592E-01 1.38E-01	G
K-40		1.3412E+01					
			1460.75	1.341E+01	(P	4.599E-01 5.11E-01	G
MN-54		-1.8977E-02					
			834.81	-1.898E-02	&(P	5.245E-02 1.56E-02	G
CO-57		-1.6149E-03					
			122.07	-1.615E-03	&(P	5.385E-02 1.59E-02	G K
			136.43	1.360E-01	&	4.158E-01 1.25E-01	G
CO-60		-4.1380E-03					
			1332.51	-4.138E-03	%(P	4.511E-02 1.14E-02	G K
			1173.23	-3.001E-03	& P	5.840E-02 1.60E-02	G K
Sr-85		-8.0164E-03					
			514.00	-8.016E-03	&(	4.912E-02 1.44E-02	G
Kr-85		-1.7522E+02					
			513.99	-1.752E+02	&(	1.074E+03 3.15E+02	G
Y-88		2.1816E-03					
			1836.01	2.182E-03	%(P	4.499E-02 1.18E-02	G K
			898.02	-1.074E-02	% P	5.054E-02 1.45E-02	G
NB-94		4.0802E-03					
			871.10	4.080E-03	%(	3.815E-02 1.07E-02	G K
			702.50	1.921E-03	&	4.634E-02 1.32E-02	G K
Ag-108M		-7.1180E-03					
			722.95	-7.118E-03	&(	4.754E-02 1.37E-02	G K
			614.37	-9.111E-03	% P	4.730E-02 1.38E-02	G
			433.93	-3.058E-03	%	4.563E-02 1.32E-02	G
CD-109		1.1331E+00					
			88.04	1.133E+00	&(	2.286E+00 6.94E-01	G
SN-113		1.3170E-02					
			391.71	1.317E-02	%(	6.143E-02 1.81E-02	G K
			255.04	4.917E-01	%	1.938E+00 5.78E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	3.9692E-02						
		427.95	3.969E-02	%(P	1.348E-01	4.01E-02	G K
		600.77	-4.313E-02	% P	2.338E-01	6.82E-02	G
		636.15	5.778E-02	% P	3.250E-01	9.35E-02	G
		463.51	2.006E-01	% P	3.905E-01	1.19E-01	G
		176.29	-1.633E-01	%	7.248E-01	2.17E-01	G
I-131	-8.5021E-03						
		364.48	-8.502E-03	%(P	7.158E-02	2.08E-02	G K
		636.97	0.000E+00	&	1.038E+00	2.96E-01	G
		284.29	3.047E-01	& P	8.604E-01	2.58E-01	G
CS-134	8.0604E-03						
		604.66	8.060E-03	%(	3.615E-02	1.05E-02	G K
		795.76	-1.716E-03	% P	6.058E-02	1.72E-02	G
		569.29	2.797E-02	% P	2.538E-01	7.26E-02	G
		801.84	4.507E-02	& P	5.222E-01	1.47E-01	G
CS-137	4.3854E-01						
		661.62	4.385E-01	(P	6.386E-02	3.47E-02	G
CE-139	1.3990E-02						
		165.85	1.399E-02	%(	5.517E-02	1.65E-02	G
EU-152	-3.9609E-02						
		121.78	-3.961E-02	&(P	1.785E-01	5.33E-02	G K
		344.30	-1.500E-02	% P	1.458E-01	4.27E-02	G
		1408.08	1.710E-03	%	2.146E-01	5.78E-02	G
		964.00	-1.025E-02	% P	3.647E-01	1.02E-01	G
		1112.07	3.759E-02	%	4.139E-01	1.18E-01	G
		778.90	-6.273E-02	%	3.453E-01	1.00E-01	G
EU-154	-2.7890E-02						
		123.10	-2.789E-02	%(	1.283E-01	3.84E-02	G K
		1274.80	-3.259E-04	%	1.351E-01	3.69E-02	G
		723.30	-7.651E-02	%	2.610E-01	7.73E-02	G
		1004.80	-7.354E-02	&	2.953E-01	8.63E-02	G
EU-155	7.7467E-03						
		86.45	7.747E-03	%(	2.715E-01	8.04E-02	G K
		105.31	1.034E-01	%	2.588E-01	7.81E-02	G
HG-203	2.6756E-02						
		279.17	2.676E-02	%(P	4.501E-02	1.38E-02	G K
		72.87	-5.862E-01	% P	2.881E+00	8.62E-01	G
		70.83	-8.666E-02	%	4.295E+00	1.26E+00	G
		82.50	3.335E-01	%	4.347E+00	1.29E+00	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	2.4038E-01						
		583.14	2.247E-01	*(P	5.447E-02	2.63E-02	G
		510.72	3.002E-01	*(P	2.046E-01	7.27E-02	G
PB-212	5.3947E-01						
		238.63	5.395E-01	(P	1.093E-01	4.31E-02	G K
							Energy duplication
		77.11	5.395E-01	} P	4.622E-01	1.23E-01	G
		74.81	1.348E+00	+ P	9.492E-01	3.07E-01	G
PB-214	5.2889E-01						
		351.99	5.274E-01	(P	1.126E-01	4.96E-02	G K
		295.22	5.317E-01	(P	1.877E-01	7.26E-02	G
							Energy duplication
		77.11	0.000E+00	} P	1.052E+00	0.00E+00	G
		241.92	3.439E-01	-	4.431E-01	1.31E-01	G
BI-212	4.5195E-01						
		727.17	4.519E-01	*(P	3.108E-01	1.16E-01	G K
		1620.56	1.911E-01	% P	1.243E+00	3.36E-01	G
		785.42	-3.825E-02	%	2.120E+00	5.94E-01	G
BI-214	5.3237E-01						
		609.32	5.214E-01	(P	9.044E-02	4.43E-02	G K
		1764.51	3.216E-01	- P	1.286E-01	6.85E-02	G
		1120.28	5.660E-01	(P	3.410E-01	1.30E-01	G
RA-224	8.5144E-01						
		241.00	8.514E-01	&(	1.297E+00	3.97E-01	G
RA-226	1.4122E+00						
		185.99	1.412E+00	(P	1.274E+00	3.97E-01	G
AC-228	7.7502E-01						
		911.07	7.710E-01	@(P	1.796E-01	9.40E-02	G K
		968.90	7.857E-01	(P	3.013E-01	1.37E-01	G
		338.40	7.692E-01	(P	2.966E-01	1.17E-01	G
TH-227	-1.4784E-01						
		236.00	-1.478E-01	%(	4.930E-01	1.48E-01	G K
		256.25	1.386E-01	& P	5.247E-01	1.56E-01	G
PA-234	-3.9388E-02						
		98.44	-3.939E-02	&(P	2.712E-01	8.07E-02	G K
		946.00	-2.131E-02	% P	2.244E-01	6.34E-02	G
		131.28	-5.350E-02	% P	2.616E-01	7.82E-02	G
		94.67	1.519E-01	& P	4.293E-01	1.29E-01	G
		883.24	2.170E-02	%	3.208E-01	8.94E-02	G
		926.70	6.539E-02	&	3.853E-01	1.10E-01	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26 4.064E-02 % P 3.749E-01 1.07E-01 G

TH-234       2.0697E+00
                           63.29 2.070E+00 %(P 7.535E+00 2.25E+00 G K
                           92.80 1.536E+00 % P 2.661E+00 8.05E-01 G
                           92.38 1.717E+00 & P 3.178E+00 9.59E-01 G

AM-241      -1.3091E-02
                           59.54-1.309E-02 &(P 1.306E+00 3.85E-01 G
   ( - This peak used in the nuclide activity average.

   * - Peak is too wide, but only one peak in library.
   ! - Peak is part of a multiplet and this area went
       negative during deconvolution.
   ? - Peak is too narrow.
   @ - Peak is too wide at FW25M, but ok at FWHM.
   % - Peak fails sensitivity test.
   $ - Peak identified, but first peak of this nuclide
       failed one or more qualification tests.
   + - Peak activity higher than counting uncertainty range.
   - - Peak activity lower than counting uncertainty range.
   = - Peak outside analysis energy range.
   & - Calculated peak centroid is not close enough to the
       library energy centroid for positive identification.
   P - Peakbackground subtraction
   } - Peak is too close to another for the activity
       to be found directly.

   Nuclide Codes:                      Peak Codes:
   T - Thermal Neutron Activation      G - Gamma Ray
   F - Fast Neutron Activation         X - X-Ray
   I - Fission Product                 P - Positron Decay
   N - Naturally Occurring Isotope     S - Single-Escape
   P - Photon Reaction                 D - Double-Escape
   C - Charged Particle Reaction       K - Key Line
   M - No MDA Calculation              A - Not in Average
   R - Coincidence Corrected           C - Coincidence Peak
   H - Halflife limit exceeded

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
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***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	1.7821E-01	1.9044E-01	4.1497E-01	4.1511E-01	4.297E-01
K-40		1.3412E+01	1.3412E+01	1.5338E+00	1.7202E+00	
MN-54	#A	-1.8762E-02	-1.8977E-02	4.9179E-02	4.9191E-02	5.186E-02
CO-57	#B	-1.5939E-03	-1.6149E-03	6.5580E-02	6.5580E-02	5.315E-02
CO-60	#B	-4.1304E-03	-4.1380E-03	3.9726E-01	3.9726E-01	4.502E-02

Sr-85	#A	-7.5900E-03	-8.0164E-03	4.3165E-02	4.3168E-02	4.650E-02
Kr-85	#A	-1.7522E+02	-1.7522E+02	9.4353E+02	9.4359E+02	1.074E+03
Y-88	#B	2.1103E-03	2.1816E-03	3.5530E-02	3.5530E-02	4.352E-02
NB-94	#B	4.0802E-03	4.0802E-03	3.2167E-02	3.2167E-02	3.815E-02
Ag-108M	#B	-7.1174E-03	-7.1180E-03	4.1100E-02	4.1102E-02	4.754E-02
CD-109	#A	1.1243E+00	1.1331E+00	2.0817E+00	2.0826E+00	2.268E+00
SN-113	#B	1.2771E-02	1.3170E-02	5.4343E-02	5.4349E-02	5.956E-02
SB-125	#B	3.9554E-02	3.9692E-02	1.2024E-01	1.2026E-01	1.344E-01
I-131	#B	-5.4715E-03	-8.5021E-03	7.7166E-02	7.7168E-02	4.607E-02
CS-134	#B	8.0226E-03	8.0604E-03	3.1548E-02	3.1552E-02	3.598E-02
CS-137		4.3839E-01	4.3854E-01	1.0394E-01	1.0701E-01	
CE-139	#A	1.3634E-02	1.3990E-02	4.9539E-02	4.9545E-02	5.376E-02
EU-152	#B	-3.9579E-02	-3.9609E-02	1.7379E-01	1.7380E-01	1.783E-01
EU-154	#B	-2.7858E-02	-2.7890E-02	1.1510E-01	1.1511E-01	1.281E-01
EU-155	#B	7.7316E-03	7.7467E-03	2.4121E-01	2.4121E-01	2.709E-01
HG-203	#B	2.4796E-02	2.6756E-02	4.1361E-02	4.1390E-02	4.171E-02
TL-208	#	2.4038E-01	2.4038E-01	8.4497E-02	8.5642E-02	
PB-212		5.3947E-01	5.3947E-01	1.2924E-01	1.3298E-01	
PB-214		5.2889E-01	5.2889E-01	1.3148E-01	1.3502E-01	
BI-212	#	4.5195E-01	4.5195E-01	3.4661E-01	3.4760E-01	
BI-214		5.3237E-01	5.3237E-01	1.3582E-01	1.3929E-01	
RA-224	#A	8.5144E-01	8.5144E-01	1.1911E+00	1.1921E+00	1.297E+00
RA-226	#	1.4122E+00	1.4122E+00	1.1922E+00	1.1950E+00	1.274E+00
AC-228		7.7502E-01	7.7502E-01	2.0237E-01	2.0731E-01	
TH-227	#B	-1.4784E-01	-1.4784E-01	4.4451E-01	4.4459E-01	4.930E-01
PA-234	#B	-3.9388E-02	-3.9388E-02	2.7550E-01	2.7551E-01	2.712E-01
TH-234	#B	2.0697E+00	2.0697E+00	6.7504E+00	6.7514E+00	7.535E+00
AM-241	#A	-1.3091E-02	-1.3091E-02	1.8011E+00	1.8011E+00	1.306E+00

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (86.4 to 2000.7 keV) 1.6918835E+01 pCi/gm
Total Decayed Activity (86.4 to 2000.7 keV) 1.6918978E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JPK

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 107F_5SEP2006_1247.An1

Sample description
FSS-OOL-05-07-018-F-B

Spectrum Filename: C:\GammaVision\Spectra\107F_5SEP2006_1247.An1

Acquisition information
Start time: 05-Sep-2006 12:47:44
Live time: 2000
Real time: 2002
Dead time: 0.12 %
Detector ID: 2

Detector system
Det 107- DSPE- 634

Calibration
Filename: D7_1LSa.Clb
Detector 107 Calibration for 1 Liter Sand Marinelli

Energy Calibration
Created: 29-Oct-2004 06:48:53
Zero offset: 0.157 keV
Gain: 0.500 keV/channel
Quadratic: -1.676E-08 keV/channel^2

Efficiency Calibration
Created: 29-Oct-2004 06:51:32
Type: Polynomial
Uncertainty: 1.174 %
Coefficients: -0.279532 -4.778179 0.614896
-0.087174 0.005356 -0.000131

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.16keV)
Stop channel: 4000 (2000.15keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 1.4890E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.4890E+03) =
6.7159E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit:	12.000
Activity range factor:	2.000
Min. step backg. energy	0.000
Multiplet shift channel	2.000

Corrections	Status	Comments
Decay correct to date:	YES	31-Aug-2006 15:50:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	107_150K_28APR05.Pbc 01-May-2005 05:30:33
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 7 cutoff 20.00000 %

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
75.92	290.	18.04	1.50	2.849E-02	74.81	9.600	9.605E-01	PB212
91.92	134.	31.39	1.50	3.429E-02				
91.92	134.	31.39	1.50	3.429E-02	92.38	2.570	PBC<MDA	TH234
182.92	176.	22.50	2.04	3.632E-02				
206.37	116.	32.43	1.32	3.452E-02				
235.54	1278.	4.36	1.75	3.214E-02				
235.54	1278.	4.36	1.75	3.214E-02	236.00	11.200	3.226E+00	TH227
266.22	91.	28.82	1.23	2.974E-02				
291.05	203.	13.65	1.54	2.796E-02				
296.75	60.	37.32	1.64	2.757E-02				
323.02	82.	32.50	1.45	2.590E-02				
333.62	216.	12.36	1.79	2.528E-02				
346.99	421.	6.75	2.14	2.453E-02				
456.43	114.	18.39	1.91	1.977E-02				
503.53	180.	14.48	2.49	1.829E-02				
574.87	342.	7.27	1.52	1.647E-02				
600.64	323.	7.80	1.59	1.592E-02				
600.64	323.	7.80	1.59	1.592E-02	600.77	18.400	1.001E+00	SB125
652.23	81.	26.14	1.27	1.493E-02				
716.70	92.	17.61	1.31	1.389E-02				
758.10	117.	20.22	1.55	1.332E-02				
784.04	33.	34.56	1.68	1.297E-02	785.42	2.000	PBC<MDA	BI212
898.11	264.	9.57	2.45	1.173E-02	898.02	94.000	2.233E-01	Y88
954.08	196.	10.18	2.49	1.122E-02				
1104.35	129.	21.53	1.72	1.008E-02				
1440.05	1290.	2.88	2.38	8.279E-03				

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

Peak Centroid Channel	Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
365.49	182.92	468.	225.	0.113	45.32	2.041	MO-99	s
412.38	206.37	483.	116.	0.058	97.28	1.320	U-235	
470.71	235.54	1455.	346.	0.173	49.46	1.753	J-134	s
532.06	266.22	246.	91.	0.045	86.47	1.230	SE-75	s
581.72	291.05	236.	204.	0.102	38.23	1.545	CE-143	s
645.66	323.02	223.	82.	0.041	97.50	1.452	-	
666.86	333.62	170.	236.	0.118	30.45	1.787	AU-196	s
693.59	346.99	87.	483.	0.241	15.92	2.136	HF-181	s
912.45	456.43	105.	114.	0.057	47.37	1.907	PA-234	s
1006.65	503.53	125.	190.	0.095	33.12	2.486	J-132	s
1149.32	574.87	92.	342.	0.171	20.12	1.524	PA-234	
1304.04	652.23	108.	81.	0.041	63.83	1.274	SR-91	
1432.98	716.70	59.	92.	0.046	47.19	1.308	RH-106M	s
1515.76	758.10	102.	117.	0.058	60.65	1.550	ZR-95	s
1907.72	954.08	64.	197.	0.098	27.53	2.493	SB-126	s

Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM	Suspected
2208.26	1104.35	128.	121.	0.060	48.15	1.721	J-135 s
2879.69	1440.05	24.	1290.	0.645	8.64	2.379	J-132

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-212	151.51	75.92	1257.	290.	0.145	54.11	1.500s
TH-234	183.51	91.92	935.	134.	0.067	94.17	1.500s
TH-227	470.32	235.34	555.	932.	0.466	14.54	1.500s
SB-125	1201.20	600.81	106.	277.	0.139	23.77	1.552s
BI-212	1567.64	784.04	55.	33.	0.017	103.69	1.677s
Y-88	1795.96	898.20	54.	228.	0.114	23.89	1.752s

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	Peak MDA Value pCi/gm	COMMENTS
BE-7		8.8047E-02					
			477.56	8.805E-02	%(	2.417E-01 7.24E-02	G
K-40		-9.9426E-02					
			1460.75	-9.943E-02	%(P	2.402E-01 6.04E-02	G
MN-54		-3.8562E-04					
			834.81	-3.856E-04	%(P	3.097E-02 8.77E-03	G
CO-57		6.0992E-03					
			122.07	6.099E-03	%(P	3.661E-02 1.10E-02	G K
			136.43	-9.535E-02	& P	2.533E-01 7.64E-02	G
CO-60		2.8119E-03					
			1332.51	2.812E-03	%(P	2.898E-02 7.87E-03	G K
			1173.23	2.095E-02	% P	4.107E-02 1.24E-02	G K

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
Sr-85	6.0486E-03						
		514.00	6.049E-03	%(	2.320E-02	6.84E-03	G
Kr-85	9.7452E+01						
		513.99	9.745E+01	%(P	5.178E+02	1.50E+02	G
Y-88	9.2679E-02						
		1836.01	-3.046E-03	%(P	2.386E-02	6.08E-03	G K
		898.02	1.939E-01	(P	3.142E-02	1.55E-02	G
NB-94	8.9275E-03						
		871.10	8.927E-03	%(P	2.581E-02	7.66E-03	G K
		702.50	-7.994E-03	% P	3.135E-02	9.23E-03	G K
Ag-108M	-6.3473E-05						
		722.95	-6.347E-05	%(	3.291E-02	9.39E-03	G K
		614.37	1.660E-03	&	2.962E-02	8.52E-03	G
		433.93	7.527E-04	% P	2.031E-02	5.76E-03	G
CD-109	1.5360E-01						
		88.04	1.536E-01	&(P	1.214E+00	3.64E-01	G
SN-113	-1.6905E-03						
		391.71	-1.691E-03	%(P	4.078E-02	1.18E-02	G K
		255.04	1.978E-01	&	1.174E+00	3.48E-01	G
SB-125	3.4509E-01						
		427.95	2.412E-02	&(P	8.127E-02	2.41E-02	G K
		600.77	8.614E-01	(P	1.573E-01	6.86E-02	G
		636.15	-4.020E-02	& P	2.441E-01	7.08E-02	G
		463.51	-1.329E-02	% P	2.273E-01	6.42E-02	G
		176.29	-1.001E-01	% P	4.469E-01	1.34E-01	G
I-131	6.4486E-04						
		364.48	6.449E-04	&(	4.406E-02	1.28E-02	G K
		636.97	-1.007E-02	%	5.321E-01	1.52E-01	G
		284.29	0.000E+00	%	6.613E-01	1.94E-01	G
CS-134	-3.0108E-02						
		604.66	-3.011E-02	%(P	4.259E-02	1.31E-02	G K
		795.76	6.471E-03	& P	3.350E-02	9.74E-03	G
		569.29	0.000E+00	&	2.356E-01	6.86E-02	G
		801.84	6.013E-02	% P	3.012E-01	8.74E-02	G
CS-137	-2.9084E-03						
		661.62	-2.908E-03	%(P	3.420E-02	9.60E-03	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CE-139	3.7053E-04						
		165.85	3.705E-04	&(P	3.710E-02	1.10E-02	G
EU-152	1.6980E-02						
		121.78	1.698E-02	%(P	1.026E-01	3.07E-02	G K
		344.30	-8.881E-02	% P	1.411E-01	4.31E-02	G
		1408.08	2.651E-02	% P	1.246E-01	3.53E-02	G
		964.00	-2.048E-02	% P	1.901E-01	5.40E-02	G
		1112.07	4.739E-02	% P	2.752E-01	7.99E-02	G
		778.90	-5.957E-02	% P	2.382E-01	6.99E-02	G
EU-154	1.1869E-02						
		123.10	1.187E-02	&(P	7.295E-02	2.18E-02	G K
		1274.80	-1.271E-02	& P	9.922E-02	2.83E-02	G
		723.30	-5.358E-03	% P	1.797E-01	5.18E-02	G
		1004.80	-9.583E-03	% P	1.763E-01	4.99E-02	G
EU-155	8.1608E-02						
		86.45	8.161E-02	%(	1.263E-01	3.85E-02	G K
		105.31	4.111E-02	% P	1.375E-01	4.13E-02	G
HG-203	8.1378E-04						
		279.17	8.138E-04	%(P	3.421E-02	1.00E-02	G K
		72.87	4.654E-01	% P	1.028E+00	3.11E-01	G
		70.83	-3.597E-02	%	1.241E+00	3.68E-01	G
		82.50	-3.121E-01	%	1.740E+00	5.21E-01	G
TL-208	3.0846E-03						
		583.14	3.085E-03	&(P	3.311E-02	9.52E-03	G
		510.72	-1.007E-01	% P	1.209E-01	3.06E-02	G
PB-212	1.2661E-01						
		238.63	-5.913E-02	%(P	1.055E-01	3.18E-02	G K
							Energy duplication
		77.11	-1.689E-01	%	3.102E-01	9.43E-02	G
		74.81	9.605E-01	*(P	5.572E-01	1.76E-01	G
PB-214	-1.5943E-02						
		351.99	-1.594E-02	%(P	6.879E-02	2.01E-02	G K
		295.22	-1.949E-02	& P	1.761E-01	5.20E-02	G
							Energy duplication
		77.11	-2.899E-01	% P	5.082E-01	1.54E-01	G
		241.92	-2.046E-01	% P	4.257E-01	1.29E-01	G
BI-212	2.6240E-01						
		727.17	1.093E-01	%(P	1.981E-01	6.04E-02	G K
		1620.56	1.075E-01	% P	7.177E-01	1.92E-01	G
		785.42	1.165E+00	&(P	1.308E+00	4.18E-01	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments

BI-214      -1.8324E-02
                          609.32-1.832E-02 &(P 5.518E-02 1.58E-02 G K
                         1764.51-7.211E-03 & P 1.832E-01 4.78E-02 G
                         1120.28 3.534E-02 % P 2.187E-01 6.28E-02 G

RA-224      -4.7174E-01
                          241.00-4.717E-01 %(P 8.503E-01 2.58E-01 G

RA-226      -4.0631E-01
                          185.99-4.063E-01 &(  9.515E-01 2.88E-01 G

AC-228      -7.0359E-03
                          911.07-7.036E-03 &(P 7.541E-02 1.94E-02 G K
                          968.90-8.456E-03 & P 1.333E-01 3.54E-02 G
                          338.40-7.763E-02 & P 2.356E-01 7.01E-02 G

TH-227       2.3525E+00
                          236.00 2.353E+00 *(P 2.840E-01 1.14E-01 G K
                          256.25-9.429E-02 & P 3.879E-01 1.15E-01 G

PA-234       4.7722E-02
                           98.44 4.772E-02 %(  1.286E-01 3.88E-02 G K
                          946.00-6.895E-02 %   2.011E-01 6.01E-02 G
                          131.28 3.129E-02 %   1.503E-01 4.51E-02 G
                           94.67-1.333E-01 %   2.648E-01 8.04E-02 G
                          883.24 7.456E-04 &   2.776E-01 7.90E-02 G
                          926.70 8.618E-02 &   2.512E-01 7.46E-02 G
                          569.26 0.000E+00 &   3.479E-01 1.01E-01 G

TH-234       8.5506E-01
                           63.29 5.070E-01 %(P 1.645E+00 4.94E-01 G K
                           92.80-1.835E-01 % P 1.390E+00 4.11E-01 G
                           92.38 1.383E+00  (P 1.495E+00 4.60E-01 G

AM-241       4.5396E-02
                           59.54 4.540E-02 %(P 2.198E-01 6.60E-02 G
   ( - This peak used in the nuclide activity average.

   * - Peak is too wide, but only one peak in library.
   ! - Peak is part of a multiplet and this area went
       negative during deconvolution.
   ? - Peak is too narrow.
   @ - Peak is too wide at FW25M, but ok at FWHM.
   % - Peak fails sensitivity test.
   $ - Peak identified, but first peak of this nuclide
       failed one or more qualification tests.
```

+ - Peak activity higher than counting uncertainty range.
- - Peak activity lower than counting uncertainty range.
= - Peak outside analysis energy range.
& - Calculated peak centroid is not close enough to the library energy centroid for positive identification.
P - Peakbackground subtraction
} - Peak is too close to another for the activity to be found directly.

Nuclide Codes:
T - Thermal Neutron Activation
F - Fast Neutron Activation
I - Fission Product
N - Naturally Occurring Isotope
P - Photon Reaction
C - Charged Particle Reaction
M - No MDA Calculation
R - Coincidence Corrected
H - Halflife limit exceeded

Peak Codes:
G - Gamma Ray
X - X-Ray
P - Positron Decay
S - Single-Escape
D - Double-Escape
K - Key Line
A - Not in Average
C - Coincidence Peak

- -

***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	8.2650E-02	8.8047E-02	2.1707E-01	2.1713E-01	2.269E-01
K-40	#A	-9.9426E-02	-9.9426E-02	5.3328E-01	5.3332E-01	2.402E-01
MN-54	#A	-3.8147E-04	-3.8562E-04	2.7242E-01	2.7242E-01	3.064E-02
CO-57	#B	6.0234E-03	6.0992E-03	3.2866E-02	3.2867E-02	3.615E-02
CO-60	#B	2.8069E-03	2.8119E-03	2.3609E-02	2.3610E-02	2.893E-02
Sr-85	#A	5.7415E-03	6.0486E-03	2.0528E-02	2.0531E-02	2.203E-02
Kr-85	#A	9.7448E+01	9.7452E+01	4.4987E+02	4.4990E+02	5.178E+02
Y-88	#F	8.9788E-02	9.2679E-02	2.2295E-02	2.2957E-02	2.311E-02
NB-94	#B	8.9274E-03	8.9275E-03	2.2982E-02	2.2988E-02	2.581E-02
Ag-108M	#B	-6.3469E-05	-6.3473E-05	2.8178E-02	2.8178E-02	3.291E-02
CD-109	#A	1.5246E-01	1.5360E-01	1.0919E+00	1.0919E+00	1.205E+00
SN-113	#B	-1.6416E-03	-1.6905E-03	2.0048E-01	2.0048E-01	3.960E-02
SB-125	#F	3.4394E-01	3.4509E-01	8.2445E-02	8.4927E-02	8.100E-02
I-131	#B	4.2364E-04	6.4486E-04	3.8392E-02	3.8392E-02	2.895E-02
CS-134	#B	-2.9973E-02	-3.0108E-02	4.0161E-02	4.0200E-02	4.240E-02
CS-137	#A	-2.9075E-03	-2.9084E-03	4.6024E-01	4.6024E-01	3.419E-02
CE-139	#A	3.6154E-04	3.7053E-04	3.3022E-02	3.3022E-02	3.620E-02
EU-152	#B	1.6967E-02	1.6980E-02	9.2104E-02	9.2109E-02	1.026E-01
EU-154	#B	1.1856E-02	1.1869E-02	6.5429E-02	6.5433E-02	7.287E-02
EU-155	#B	8.1456E-02	8.1608E-02	1.1563E-01	1.1572E-01	1.261E-01
HG-203	#B	7.5686E-04	8.1378E-04	3.0139E-02	3.0139E-02	3.182E-02
TL-208	#A	3.0846E-03	3.0846E-03	2.8560E-02	2.8560E-02	3.311E-02
PB-212	#F	1.2661E-01	1.2661E-01	6.9426E-02	6.9828E-02	1.055E-01
PB-214	#B	-1.5943E-02	-1.5943E-02	1.1764E-01	1.1764E-01	6.879E-02
BI-212	#F	2.6240E-01	2.6240E-01	2.5940E-01	2.5986E-01	1.981E-01

BI-214 #B	-1.8324E-02	-1.8324E-02	8.7167E-02	8.7173E-02	5.518E-02

RA-224	#A	-4.7174E-01	-4.7174E-01	8.3001E-01	8.3048E-01	8.503E-01
RA-226	#A	-4.0630E-01	-4.0631E-01	8.6379E-01	8.6413E-01	9.515E-01
AC-228	#B	-7.0359E-03	-7.0359E-03	2.4566E-01	2.4566E-01	7.541E-02
TH-227	#	2.3525E+00	2.3525E+00	3.4219E-01	3.6932E-01	2.840E-01
PA-234	#B	4.7722E-02	4.7722E-02	1.1648E-01	1.1651E-01	1.286E-01
TH-234	#B	8.5506E-01	8.5506E-01	8.5304E-01	8.5435E-01	1.645E+00
AM-241	#A	4.5395E-02	4.5396E-02	1.9787E-01	1.9788E-01	2.198E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (50.2 to 2000.1 keV) 0.0000000E+00 pCi/gm
Total Decayed Activity (50.2 to 2000.1 keV) 0.0000000E+00 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JJM

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 107F_5SEPT2006_1331.An1

Sample description
FSS-OOL-05-07-009-F

Spectrum Filename: C:\GammaVision\Spectra\107F_5SEPT2006_1331.An1

Acquisition information
Start time: 05-Sep-2006 13:31:34
Live time: 2000
Real time: 2002
Dead time: 0.10 %
Detector ID: 2

Detector system
Det 107- DSPE- 634

Calibration
Filename: D7_1LSa.Clb
Detector 107 Calibration for 1 Liter Sand Marinelli

Energy Calibration
Created: 29-Oct-2004 06:48:53
Zero offset: 0.157 keV
Gain: 0.500 keV/channel
Quadratic: -1.676E-08 keV/channel^2

Efficiency Calibration
Created: 29-Oct-2004 06:51:32
Type: Polynomial
Uncertainty: 1.174 %
Coefficients: -0.279532 -4.778179 0.614896
-0.087174 0.005356 -0.000131

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.16keV)
Stop channel: 4000 (2000.15keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 1.1900E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.1900E+03) =
8.4034E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	31-Aug-2006 13:50:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	107_150K_28APR05.Pbc 01-May-2005 05:30:33
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 4 cutoff 20.00000 %

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
62.98	96.	39.47	1.22	1.983E-02				
62.98	96.	39.47	1.22	1.983E-02	63.29	3.900	PBC<MDA	TH234
75.99	248.	20.45	1.50	2.849E-02	74.81	9.600	1.030E+00	PB212
86.38	117.	26.83	1.19	3.287E-02	86.45	32.740	1.239E-01	EU155
91.17	126.	23.24	1.19	3.407E-02				
91.17	126.	23.24	1.19	3.407E-02	92.80	3.000	PBC<MDA	TH234
128.24	121.	31.58	1.42	3.816E-02				
183.36	154.	21.90	1.92	3.629E-02				
206.29	108.	31.37	1.92	3.453E-02				
235.94	1045.	4.76	1.65	3.211E-02				
235.94	1045.	4.76	1.65	3.211E-02	236.00	11.200	3.300E+00	TH227
266.32	97.	26.26	1.22	2.974E-02				
291.10	246.	11.07	1.67	2.796E-02				
333.68	180.	16.27	1.65	2.527E-02				
347.01	468.	6.68	1.74	2.453E-02				
503.57	147.	12.82	2.53	1.828E-02				
574.93	321.	8.06	1.74	1.647E-02				
600.75	342.	6.30	1.64	1.592E-02				
600.75	342.	6.30	1.64	1.592E-02	600.77	18.400	1.327E+00	SB125
652.39	504.	5.80	1.98	1.493E-02				
716.91	93.	25.13	1.39	1.389E-02				
758.35	62.	30.09	1.52	1.331E-02				
783.88	38.	33.58	1.39	1.298E-02				
783.88	38.	33.58	1.39	1.298E-02	785.42	2.000	1.609E+00	BI212
898.44	220.	9.90	1.67	1.173E-02	898.02	94.000	2.323E-01	Y88
953.96	175.	12.23	2.57	1.122E-02				
1104.44	107.	19.44	1.54	1.007E-02				
1440.07	833.	3.61	2.36	8.279E-03				

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
182.36	91.35	601.	128.	0.064	85.33	1.235	PB-214	s
256.13	128.24	485.	153.	0.077	65.67	1.419	AC-228	s
366.37	183.36	381.	180.	0.090	51.17	1.919	MO-99	s
412.22	206.29	400.	108.	0.054	94.12	1.923	U-235	s
471.52	235.94	1150.	342.	0.171	45.03	1.651	TH-227	s
532.27	266.32	211.	97.	0.048	78.77	1.224	SE-75	s
581.83	291.10	200.	246.	0.123	30.92	1.670	CE-143	s
666.98	333.68	198.	208.	0.104	35.47	1.647	NP-239	s
693.63	347.01	71.	586.	0.293	13.82	1.736	HF-181	s
1006.73	503.57	80.	147.	0.073	35.76	2.531	J-132	s
1149.43	574.93	104.	323.	0.161	21.45	1.735	PA-234	s
1304.36	652.39	90.	504.	0.252	17.40	1.978	SR-91	s
1433.39	716.91	112.	93.	0.047	57.15	1.392	RH-106M	

Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM	Suspected	
1516.28	758.35	81.	62.	0.031	90.27	1.515	ZR-95	
1907.48	953.96	65.	177.	0.089	29.67	2.574	SB-126	s
2208.44	1104.44	76.	107.	0.054	45.07	1.537	J-135	
2879.73	1440.07	22.	833.	0.417	10.82	2.356	J-132	s

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-212	151.66	75.99	1205.	248.	0.124	61.35	1.500s
EU-155	171.79	86.06	854.	142.	0.071	90.75	1.500
TH-227	470.28	235.32	543.	703.	0.351	18.05	1.500s
SB-125	1201.03	600.72	62.	306.	0.153	20.21	1.552s
BI-212	1567.33	783.88	48.	33.	0.016	99.30	1.677s
Y-88	1796.40	898.42	55.	176.	0.088	28.47	1.752

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	Peak MDA Value pCi/gm	COMMENTS
BE-7		-1.0613E-01					
			477.56	-1.061E-01	%(	3.093E-01 9.24E-02	G
K-40		-6.2075E-02					
			1460.75	-6.207E-02	&(P	2.958E-01 6.84E-02	G
MN-54		6.1965E-03					
			834.81	6.196E-03	%(P	2.900E-02 8.37E-03	G
CO-57		6.4127E-03					
			122.07	6.413E-03	&(P	3.942E-02 1.18E-02	G K
			136.43	-2.439E-03	% P	3.433E-01 1.02E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CO-60	-9.8372E-03						
		1332.51	-9.837E-03	%(P	3.133E-02	8.07E-03	G K
		1173.23	-1.306E-02	% P	4.753E-02	1.34E-02	G K
Sr-85	2.3250E-03						
		514.00	2.325E-03	&(	2.461E-02	7.03E-03	G
Kr-85	6.2730E+00						
		513.99	6.273E+00	&(P	5.526E+02	1.54E+02	G
Y-88	8.9431E-02						
		1836.01	-2.899E-03	%(P	2.628E-02	6.39E-03	G K
		898.02	1.870E-01	(P	3.949E-02	1.79E-02	G
NB-94	4.1981E-03						
		871.10	4.198E-03	%(P	2.929E-02	8.34E-03	G K
		702.50	2.614E-03	% P	3.287E-02	9.41E-03	G K
Ag-108M	-9.6136E-05						
		722.95	-9.614E-05	&(	3.301E-02	9.28E-03	G K
		614.37	5.593E-03	&	3.219E-02	9.35E-03	G
		433.93	1.291E-02	& P	3.250E-02	9.74E-03	G
CD-109	-1.4847E-01						
		88.04	-1.485E-01	&(P	1.361E+00	4.07E-01	G
SN-113	5.9270E-03						
		391.71	5.927E-03	%(P	4.612E-02	1.35E-02	G K
		255.04	-1.774E-02	%	1.275E+00	3.72E-01	G
SB-125	4.7080E-01						
		427.95	2.421E-02	%(P	1.065E-01	3.14E-02	G K
		600.77	1.189E+00	*(P	1.530E-01	8.05E-02	G
		636.15	6.865E-02	& P	2.545E-01	7.47E-02	G
		463.51	3.113E-02	& P	3.272E-01	9.49E-02	G
		176.29	9.278E-02	% P	5.347E-01	1.60E-01	G
I-131	-1.3597E-02						
		364.48	-1.360E-02	&(	5.903E-02	1.75E-02	G K
		636.97	1.781E-01	&	5.633E-01	1.67E-01	G
		284.29	8.405E-02	%	7.482E-01	2.21E-01	G
CS-134	-3.6746E-02						
		604.66	-3.675E-02	%(P	5.308E-02	1.63E-02	G K
		795.76	-2.610E-03	% P	3.752E-02	1.06E-02	G
		569.29	-3.694E-02	&	2.074E-01	6.07E-02	G
		801.84	4.791E-02	& P	3.391E-01	9.69E-02	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments

CS-137       1.9456E-03
                          661.62 1.946E-03 &(P 3.245E-02 9.04E-03 G

CE-139       4.7053E-03
                          165.85 4.705E-03 %(P 4.302E-02 1.28E-02 G

EU-152       1.9904E-02
                          121.78 1.990E-02 %(P 1.201E-01 3.59E-02 G K
                          344.30-1.074E-01 % P 1.771E-01 5.40E-02 G
                         1408.08-6.850E-03 % P 1.507E-01 4.00E-02 G
                          964.00-2.020E-02 % P 2.263E-01 6.39E-02 G
                         1112.07-4.279E-03 % P 3.910E-01 1.11E-01 G
                          778.90 1.126E-02 % P 2.860E-01 8.16E-02 G

EU-154      -4.5982E-05
                          123.10-4.598E-05 &(P 8.198E-02 2.43E-02 G K
                         1274.80-2.949E-02 % P 1.303E-01 3.79E-02 G
                          723.30 2.761E-02 & P 1.642E-01 4.76E-02 G
                         1004.80 6.202E-02 % P 1.689E-01 5.01E-02 G

EU-155       1.5045E-01
                           86.45 1.504E-01  (  1.469E-01 4.55E-02 G K
                          105.31 6.223E-04 % P 1.708E-01 5.07E-02 G

HG-203      -3.7624E-03
                          279.17-3.762E-03 %(P 4.103E-02 1.21E-02 G K
                           72.87 7.652E-01 % P 1.192E+00 3.63E-01 G
                           70.83-1.144E+00 &   2.258E+00 6.86E-01 G
                           82.50 1.918E-01 %   2.505E+00 7.48E-01 G

TL-208       2.7612E-03
                          583.14 2.761E-03 %(P 3.303E-02 9.32E-03 G
                          510.72-1.019E-01 & P 1.574E-01 3.96E-02 G

PB-212       1.6266E-01
                          238.63-3.052E-02 %(P 1.123E-01 3.33E-02 G K
                                                          Energy duplication
                           77.11-1.778E-01 &   3.690E-01 1.12E-01 G
                           74.81 1.030E+00 *(P 6.828E-01 2.14E-01 G

PB-214      -7.7157E-02
                          351.99-7.716E-02 %(P 9.719E-02 2.97E-02 G K
                          295.22 6.617E-02 % P 1.832E-01 5.50E-02 G
                                                          Energy duplication
                           77.11-3.079E-01 & P 6.047E-01 1.83E-01 G
                          241.92-3.465E-01 & P 5.399E-01 1.65E-01 G
```

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments

BI-212       1.6574E-01
                          727.17-5.050E-02 %(P 2.829E-01 8.11E-02 G K
                         1620.56-1.371E-02 % P 1.069E+00 2.76E-01 G
                          785.42 1.442E+00 @(P 1.535E+00 4.95E-01 G

BI-214      -6.9025E-03
                          609.32-6.902E-03 &(P 6.490E-02 1.78E-02 G K
                         1764.51 1.565E-03 % P 1.820E-01 4.62E-02 G
                         1120.28 3.730E-02 & P 2.296E-01 6.53E-02 G

RA-224      -4.5095E-01
                          241.00-4.509E-01 &(P 1.057E+00 3.19E-01 G

RA-226      -2.6305E-01
                          185.99-2.630E-01 &(  1.154E+00 3.46E-01 G

AC-228      -2.2273E-02
                          911.07-2.227E-02 &(P 1.084E-01 2.89E-02 G K
                          968.90-3.578E-02 & P 2.056E-01 5.74E-02 G
                          338.40-1.176E-01 % P 2.894E-01 8.65E-02 G

TH-227       2.2191E+00
                          236.00 2.219E+00 *(P 3.515E-01 1.34E-01 G K
                          256.25-1.153E-01 % P 4.639E-01 1.38E-01 G

PA-234       2.5152E-02
                           98.44 2.515E-02 %(  1.178E-01 3.52E-02 G K
                          946.00-3.046E-02 &   1.895E-01 5.48E-02 G
                          131.28-4.851E-02 %   1.909E-01 5.73E-02 G
                           94.67-1.386E-01 &   2.940E-01 8.91E-02 G
                          883.24 9.360E-02 %   2.495E-01 7.43E-02 G
                          926.70-6.454E-02 &   3.097E-01 8.99E-02 G
                          569.26-5.456E-02 &   3.063E-01 8.96E-02 G

TH-234       1.1816E+00
                           63.29 1.182E+00 %(P 1.857E+00 5.64E-01 G K
                           92.80-2.643E-01 % P 1.401E+00 4.11E-01 G
                           92.38-4.316E-01 % P 1.385E+00 4.12E-01 G

AM-241       9.1851E-03
                           59.54 9.185E-03 %(P 2.663E-01 7.93E-02 G
   ( - This peak used in the nuclide activity average.

   * - Peak is too wide, but only one peak in library.
   ! - Peak is part of a multiplet and this area went
       negative during deconvolution.
```

? - Peak is too narrow.
@ - Peak is too wide at FW25M, but ok at FWHM.
% - Peak fails sensitivity test.
$ - Peak identified, but first peak of this nuclide failed one or more qualification tests.
+ - Peak activity higher than counting uncertainty range.
- - Peak activity lower than counting uncertainty range.
= - Peak outside analysis energy range.
& - Calculated peak centroid is not close enough to the library energy centroid for positive identification.
P - Peakbackground subtraction
} - Peak is too close to another for the activity to be found directly.

Nuclide Codes:
T - Thermal Neutron Activation
F - Fast Neutron Activation
I - Fission Product
N - Naturally Occurring Isotope
P - Photon Reaction
C - Charged Particle Reaction
M - No MDA Calculation
R - Coincidence Corrected
H - Halflife limit exceeded

Peak Codes:
G - Gamma Ray
X - X-Ray
P - Positron Decay
S - Single-Escape
D - Double-Escape
K - Key Line
A - Not in Average
C - Coincidence Peak

- -

***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	-9.9476E-02	-1.0613E-01	2.7725E-01	2.7732E-01	2.899E-01
K-40	#A	-6.2075E-02	-6.2075E-02	3.1774E+01	3.1774E+01	2.958E-01
MN-54	#A	6.1282E-03	6.1965E-03	2.5099E-02	2.5101E-02	2.868E-02
CO-57	#B	6.3311E-03	6.4127E-03	3.5303E-02	3.5304E-02	3.892E-02
CO-60	#B	-9.8195E-03	-9.8372E-03	7.1827E-02	7.1829E-02	3.128E-02
Sr-85	#A	2.2042E-03	2.3250E-03	2.1085E-02	2.1085E-02	2.333E-02
Kr-85	#A	6.2728E+00	6.2730E+00	4.6153E+02	4.6153E+02	5.526E+02
Y-88	#F	8.6577E-02	8.9431E-02	2.5684E-02	2.6222E-02	2.544E-02
NB-94	#B	4.1981E-03	4.1981E-03	2.5031E-02	2.5032E-02	2.929E-02
Ag-108M	#B	-9.6129E-05	-9.6136E-05	2.7826E-02	2.7826E-02	3.301E-02
CD-109	#A	-1.4734E-01	-1.4847E-01	1.2701E+00	1.2701E+00	1.351E+00
SN-113	#B	5.7516E-03	5.9270E-03	4.0381E-02	4.0382E-02	4.476E-02
SB-125	#F	4.6919E-01	4.7080E-01	9.5568E-02	9.9531E-02	1.061E-01
I-131	#B	-8.8456E-03	-1.3597E-02	5.2569E-02	5.2575E-02	3.840E-02
CS-134	#B	-3.6578E-02	-3.6746E-02	5.0023E-02	5.0070E-02	5.284E-02
CS-137	#A	1.9450E-03	1.9456E-03	2.7108E-02	2.7109E-02	3.244E-02
CE-139	#A	4.5885E-03	4.7053E-03	3.8418E-02	3.8419E-02	4.195E-02
EU-152	#B	1.9889E-02	1.9904E-02	1.0769E-01	1.0770E-01	1.200E-01
EU-154	#B	-4.5931E-05	-4.5982E-05	9.1697E-02	9.1697E-02	8.188E-02
EU-155	#	1.5016E-01	1.5045E-01	1.3652E-01	1.3678E-01	1.467E-01

HG-203 #B	-3.4934E-03	-3.7624E-03	5.1999E-02	5.1999E-02	3.809E-02

TL-208	#A	2.7612E-03	2.7612E-03	2.7950E-02	2.7950E-02	3.303E-02
PB-212	#F	1.6266E-01	1.6266E-01	1.0134E-01	1.0179E-01	1.123E-01
PB-214	#B	-7.7157E-02	-7.7157E-02	1.0539E-01	1.0549E-01	9.719E-02
BI-212	#B	1.6574E-01	1.6574E-01	1.7089E-01	1.7117E-01	2.829E-01
BI-214	#B	-6.9025E-03	-6.9025E-03	5.8160E+00	5.8160E+00	6.490E-02
RA-224	#A	-4.5095E-01	-4.5095E-01	1.0475E+00	1.0479E+00	1.057E+00
RA-226	#A	-2.6304E-01	-2.6305E-01	1.0383E+00	1.0384E+00	1.154E+00
AC-228	#B	-2.2273E-02	-2.2273E-02	3.9719E-01	3.9719E-01	1.084E-01
TH-227	#	2.2191E+00	2.2191E+00	4.0064E-01	4.2153E-01	3.515E-01
PA-234	#B	2.5152E-02	2.5152E-02	1.0552E-01	1.0553E-01	1.178E-01
TH-234	#B	1.1816E+00	1.1816E+00	1.6926E+00	1.6939E+00	1.857E+00
AM-241	#A	9.1849E-03	9.1851E-03	2.3792E-01	2.3792E-01	2.663E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (50.2 to 2000.1 keV) 0.0000000E+00 pCi/gm
Total Decayed Activity (50.2 to 2000.1 keV) 0.0000000E+00 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JPK

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 107F_5SEPT2006_1411.An1

Sample description
FSS-OOL-05-07-012-F

Spectrum Filename: C:\GammaVision\Spectra\107F_5SEPT2006_1411.An1

Acquisition information

Start time:	05-Sep-2006 14:11:36
Live time:	2000
Real time:	2011
Dead time:	0.55 %
Detector ID:	2

Detector system
Det 107- DSPE- 634

Calibration

Filename:	D7_1LSa.Clb

Detector 107 Calibration for 1 Liter Sand Marinelli

Energy Calibration

Created:	29-Oct-2004 06:48:53
Zero offset:	0.157 keV
Gain:	0.500 keV/channel
Quadratic:	-1.676E-08 keV/channel^2

Efficiency Calibration

Created:	29-Oct-2004 06:51:32
Type:	Polynomial
Uncertainty:	1.174 %
Coefficients:	-0.279532 -4.778179 0.614896
	-0.087174 0.005356 -0.000131

Library Files

Main analysis library:	FSS_Rev_1.Lib
Library Match Width:	1.000
Peak stripping:	Library based

Analysis parameters

Analysis engine:	Env32 G53W4.20
Start channel:	100 (50.16keV)
Stop channel:	4000 (2000.15keV)
Peak rejection level:	41.667%
Peak search sensitivity:	3
Sample Size:	1.4690E+03
Activity scaling factor:	1.0000E+06/(1.0000E+00* 1.4690E+03) = 6.8074E+02
Detection limit method:	Nureg 4.16
Random error:	1.0000000E+00
Systematic error:	1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit:	12.000
Activity range factor:	2.000
Min. step backg. energy	0.000
Multiplet shift channel	2.000

Corrections	Status	Comments
Decay correct to date:	YES	31-Aug-2006 13:31:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	107_150K_28APR05.Pbc 01-May-2005 05:30:33
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 8 cutoff 20.00000 %

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
73.99	369.	12.51	1.18	2.790E-02				
73.99	369.	12.51	1.18	2.790E-02				
75.94	609.	8.36	1.18	2.889E-02	74.81	9.600	2.036E+00	PB212
82.35	104.	34.29	1.18	3.158E-02				
82.35	104.	34.29	1.18	3.158E-02	82.50	2.240	1.452E+00	HG203
86.18	228.	16.62	1.19	3.276E-02				
86.18	228.	16.62	1.19	3.276E-02	86.45	32.740	1.951E-01	EU155
88.69	203.	19.49	1.19	3.343E-02	88.04	3.790	PBC<MDA	CD109
91.84	223.	17.57	1.19	3.417E-02				
91.84	223.	17.57	1.19	3.417E-02	92.38	2.570	2.249E+00	TH234
183.46	243.	16.21	1.66	3.628E-02				
206.13	154.	21.66	1.36	3.454E-02				
235.70	1966.	3.59	1.50	3.213E-02				
235.70	1966.	3.59	1.50	3.213E-02	236.00	11.200	5.029E+00	TH227
266.34	158.	18.25	2.16	2.973E-02				
291.09	295.	9.17	1.33	2.796E-02				
296.08	112.	19.68	1.34	2.763E-02				
323.05	121.	20.88	1.63	2.590E-02				
333.36	354.	14.05	1.39	2.529E-02				
347.08	599.	6.60	1.73	2.452E-02				
456.83	130.	21.61	1.41	1.975E-02				
503.78	261.	12.70	2.07	1.828E-02				
574.99	599.	5.77	1.87	1.647E-02				
600.74	452.	5.88	1.95	1.592E-02				
600.74	452.	5.88	1.95	1.592E-02	600.77	18.400	1.420E+00	SB125
652.44	239.	12.65	1.69	1.493E-02				
716.91	121.	14.69	1.91	1.389E-02				
783.59	88.	18.23	1.21	1.299E-02				
848.27	90.	23.45	1.90	1.224E-02				

898.43	481.	6.55	1.59	1.173E-02	898.02	94.000	4.129E-01	Y88
951.56	69.	23.34	1.79	1.124E-02				
955.22	242.	8.04	1.79	1.121E-02				
1104.74	111.	16.30	1.75	1.007E-02				
1156.47	78.	31.05	1.28	9.740E-03				
1313.88	62.	20.52	1.60	8.865E-03				
1440.09	1232.	2.96	2.35	8.279E-03				

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
147.65	73.67	882.	369.	0.185	37.54	1.177	BI-207	D
151.54	75.61	992.	609.	0.305	25.07	1.179	PB-214	D
164.37	82.34	581.	104.	0.052	102.86	1.183	HG-203	lD
172.02	86.17	663.	177.	0.088	65.86	1.186	BI-207	D
177.06	88.69	704.	178.	0.089	67.04	1.188	PB-214	D
183.35	91.83	665.	217.	0.108	54.38	1.190	PB-214	D
366.56	183.46	510.	304.	0.152	35.87	1.660	U-235	s
411.90	206.13	437.	154.	0.077	64.97	1.364	U-235	s
471.04	235.70	2300.	479.	0.239	44.67	1.496	J-134	s
532.31	266.34	294.	158.	0.079	54.76	2.164	SE-75	s
581.58	290.98	351.	320.	0.160	29.94	1.914	CE-143	s
591.54	295.96	254.	94.	0.047	78.48	1.552	PB-214	s
645.71	323.05	207.	121.	0.060	62.65	1.628	CR-51	

Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM	Suspected	
666.34	333.36	482.	390.	0.195	28.32	1.392	AU-196	s
693.77	347.08	184.	716.	0.358	13.79	1.731	HF-181	s
913.27	456.83	204.	133.	0.067	52.40	1.409	PA-234	s
1007.15	503.78	222.	266.	0.133	30.04	2.074	J-132	s
1149.56	574.99	156.	613.	0.306	14.88	1.869	PA-234	s
1304.45	652.44	187.	239.	0.119	31.08	1.693	SR-91	
1433.40	716.91	78.	121.	0.060	44.07	1.910	RH-106M	s
1566.76	783.59	59.	92.	0.046	47.33	1.207	BI-212	
1696.11	848.27	106.	90.	0.045	70.35	1.902	J-134	
1796.43	898.43	479.	108.	0.054	90.87	1.590	PA-234	s
1902.69	951.72	97.	69.	0.035	70.02	1.788	SB-126	D
1910.01	955.38	69.	242.	0.121	24.11	1.790	J-132	D
2209.05	1104.74	71.	109.	0.054	43.74	1.752	KR-89	s
2312.51	1156.47	124.	78.	0.039	93.14	1.283	BI-214	s
2627.33	1313.88	27.	62.	0.031	61.57	1.600	TB-160	s
2879.77	1440.09	27.	1232.	0.616	8.89	2.355	J-132	

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
HG-203	151.33	75.83	1728.	364.	0.182	50.67	1.500s
PB-212	151.61	75.97	1992.	436.	0.218	45.29	1.500s
PB-214	153.89	77.11	2330.	-291.	-0.145	73.65	1.500D
PB-212	153.89	77.11	2325.	-286.	-0.143	73.65	1.500D
TH-234	183.22	91.78	1431.	157.	0.079	99.76	1.500s
TH-227	470.34	235.35	787.	1487.	0.744	11.16	1.500s
SB-125	1201.10	600.76	128.	425.	0.212	18.33	1.552s
CS-134	1207.24	603.83	311.	-71.	-0.035	112.39	1.555s
Y-88	1796.26	898.35	130.	371.	0.186	20.18	1.752s

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	MDA Value pCi/gm	COMMENTS
BE-7		5.1187E-02					
			477.56	5.119E-02	%(	2.581E-01	7.59E-02 G
K-40		-3.0240E-02					
			1460.75	-3.024E-02	%(P	2.260E-01	5.25E-02 G
MN-54		5.4731E-03					
			834.81	5.473E-03	%(P	3.434E-02	1.00E-02 G
CO-57		3.7181E-04					
			122.07	3.718E-04	&(P	4.450E-02	1.33E-02 G K
			136.43	9.949E-02	% P	3.285E-01	9.89E-02 G
CO-60		-3.9529E-03					
			1332.51	-3.953E-03	&(P	3.512E-02	9.36E-03 G K
			1173.23	-1.075E-02	& P	5.011E-02	1.44E-02 G K
Sr-85		-5.4821E-03					
			514.00	-5.482E-03	%(	3.436E-02	1.01E-02 G
Kr-85		-1.5486E+02					
			513.99	-1.549E+02	%(P	7.580E+02	2.22E+02 G
Y-88		1.5548E-01					
			1836.01	-1.232E-04	&(P	2.910E-02	7.57E-03 G K
			898.02	3.200E-01	@(P	4.805E-02	2.16E-02 G
NB-94		8.0826E-03					
			871.10	8.083E-03	&(P	2.728E-02	8.04E-03 G K
			702.50	-7.482E-03	& P	3.851E-02	1.13E-02 G K
Ag-108M		-7.1408E-05					
			722.95	-7.141E-05	&(	3.248E-02	9.26E-03 G K
			614.37	7.815E-05	&	3.325E-02	9.56E-03 G
			433.93	-9.430E-03	% P	3.340E-02	9.90E-03 G
CD-109		2.0167E-01					
			88.04	2.017E-01	%(P	1.518E+00	4.56E-01 G
SN-113		-9.1786E-03					
			391.71	-9.179E-03	%(P	4.931E-02	1.45E-02 G K
			255.04	3.089E-01	&	1.430E+00	4.27E-01 G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	5.1232E-01						
		427.95	-1.813E-03	%(P	1.019E-01	2.96E-02	G K
		600.77	1.339E+00	(P	1.745E-01	8.21E-02	G
		636.15	9.885E-02	% P	2.075E-01	6.28E-02	G
		463.51	-7.401E-02	% P	3.122E-01	9.17E-02	G
		176.29	4.871E-04	% P	5.526E-01	1.64E-01	G
I-131	4.1833E-03						
		364.48	4.183E-03	%(	5.372E-02	1.58E-02	G K
		636.97	-1.311E-01	&	6.960E-01	2.05E-01	G
		284.29	1.880E-01	%	7.009E-01	2.10E-01	G
CS-134	-4.2244E-02						
		604.66	-4.224E-02	?(P	5.072E-02	1.57E-02	G K
		795.76	1.059E-02	& P	3.543E-02	1.05E-02	G
		569.29	-5.116E-02	&	2.295E-01	6.81E-02	G
		801.84	1.230E-01	% P	2.952E-01	8.86E-02	G
CS-137	-5.4308E-03						
		661.62	-5.431E-03	%(P	4.451E-02	1.28E-02	G
CE-139	-1.3232E-02						
		165.85	-1.323E-02	%(P	4.523E-02	1.36E-02	G
EU-152	5.7780E-03						
		121.78	5.778E-03	&(P	1.272E-01	3.80E-02	G K
		344.30	-1.250E-01	% P	1.722E-01	5.28E-02	G
		1408.08	-5.279E-03	& P	1.029E-01	2.64E-02	G
		964.00	5.666E-02	& P	2.368E-01	6.95E-02	G
		1112.07	1.185E-02	& P	2.224E-01	6.24E-02	G
		778.90	-1.072E-01	% P	3.347E-01	9.98E-02	G
EU-154	-2.3726E-02						
		123.10	-2.373E-02	&(P	9.199E-02	2.77E-02	G K
		1274.80	6.127E-03	& P	1.143E-01	3.26E-02	G
		723.30	-1.782E-03	& P	1.596E-01	4.56E-02	G
		1004.80	2.352E-02	& P	2.025E-01	5.84E-02	G
EU-155	9.8838E-02						
		86.45	9.884E-02	%(	1.650E-01	5.02E-02	G K
		105.31	4.608E-02	% P	1.682E-01	5.06E-02	G
HG-203	1.5419E-01						
		279.17	5.035E-03	%(P	3.890E-02	1.15E-02	G K
		72.87	2.054E+00	?(P	1.108E+00	3.49E-01	G
		70.83	-1.066E+00	&	2.381E+00	7.22E-01	G
		82.50	7.338E-01	%	2.511E+00	7.57E-01	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments

TL-208       2.3107E-03
                          583.14 2.311E-03 &(P 3.467E-02 9.96E-03 G
                          510.72-9.242E-02 % P 1.533E-01 4.11E-02 G

PB-212      -1.1156E-01
                          238.63-1.116E-01 %(P 1.318E-01 4.01E-02 G K
                                                           Energy duplication
                           77.11-5.087E-01 +   4.042E-01 1.25E-01 G
                           74.81 1.467E+00 + P 7.085E-01 2.23E-01 G

PB-214      -3.6750E-02
                          351.99-3.675E-02 %(P 8.889E-02 2.65E-02 G K
                          295.22 2.782E-02 % P 1.329E-01 3.93E-02 G
                                                           Energy duplication
                           77.11-8.458E-01 + P 6.618E-01 2.04E-01 G
                          241.92-2.353E-01 & P 4.993E-01 1.51E-01 G

BI-212       8.5682E-02
                          727.17 8.568E-02 &(P 2.638E-01 7.83E-02 G K
                         1620.56 1.207E-01 % P 8.703E-01 2.37E-01 G
                          785.42 1.241E-01 & P 1.832E+00 5.29E-01 G

BI-214      -5.4896E-03
                          609.32-5.490E-03 %(P 7.736E-02 2.21E-02 G K
                         1764.51-2.257E-02 % P 1.775E-01 4.72E-02 G
                         1120.28-2.337E-03 % P 2.998E-01 8.57E-02 G

RA-224      -7.7000E-01
                          241.00-7.700E-01 &(P 1.046E+00 3.20E-01 G

RA-226      -5.7754E-01
                          185.99-5.775E-01 %(  1.141E+00 3.46E-01 G

AC-228       4.5923E-03
                          911.07 4.592E-03 &(P 1.126E-01 3.16E-02 G K
                          968.90-9.449E-03 % P 2.087E-01 5.86E-02 G
                          338.40-1.186E-01 & P 2.857E-01 8.58E-02 G

TH-227       3.8049E+00
                          236.00 3.805E+00 *(P 3.414E-01 1.42E-01 G K
                          256.25-3.655E-02 & P 4.855E-01 1.44E-01 G

PA-234       5.8263E-02
                           98.44 5.826E-02 %(  1.559E-01 4.71E-02 G K
                          946.00-5.750E-02 %   2.109E-01 6.25E-02 G
                          131.28-6.687E-02 %   1.951E-01 5.89E-02 G
                           94.67-2.043E-01 %   3.048E-01 9.30E-02 G
                          883.24 4.771E-02 &   2.406E-01 6.99E-02 G
                          926.70 1.726E-02 %   3.095E-01 8.86E-02 G
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 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26-7.564E-02 &   3.389E-01 1.01E-01 G

TH-234       1.1369E+00
                           63.29 8.061E-01 &(P 1.959E+00 5.91E-01 G K
                           92.80-1.778E-01 % P 1.640E+00 4.87E-01 G
                           92.38 1.639E+00  (P 1.868E+00 5.73E-01 G

AM-241      -2.8196E-02
                           59.54-2.820E-02 &(P 2.662E-01 7.97E-02 G
   ( - This peak used in the nuclide activity average.

   * - Peak is too wide, but only one peak in library.
   ! - Peak is part of a multiplet and this area went
       negative during deconvolution.
   ? - Peak is too narrow.
   @ - Peak is too wide at FW25M, but ok at FWHM.
   % - Peak fails sensitivity test.
   $ - Peak identified, but first peak of this nuclide
       failed one or more qualification tests.
   + - Peak activity higher than counting uncertainty range.
   - - Peak activity lower than counting uncertainty range.
   = - Peak outside analysis energy range.
   & - Calculated peak centroid is not close enough to the
       library energy centroid for positive identification.
   P - Peakbackground subtraction
   } - Peak is too close to another for the activity
       to be found directly.

   Nuclide Codes:                      Peak Codes:
   T - Thermal Neutron Activation      G - Gamma Ray
   F - Fast Neutron Activation         X - X-Ray
   I - Fission Product                 P - Positron Decay
   N - Naturally Occurring Isotope     S - Single-Escape
   P - Photon Reaction                 D - Double-Escape
   C - Charged Particle Reaction       K - Key Line
   M - No MDA Calculation              A - Not in Average
   R - Coincidence Corrected           C - Coincidence Peak
   H - Halflife limit exceeded

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
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***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	4.7953E-02	5.1187E-02	2.2777E-01	2.2779E-01	2.418E-01
K-40	#A	-3.0240E-02	-3.0240E-02	6.4863E-01	6.4864E-01	2.260E-01
MN-54	#A	5.4124E-03	5.4731E-03	3.0000E-02	3.0002E-02	3.396E-02
CO-57	#B	3.6704E-04	3.7181E-04	3.9818E-02	3.9818E-02	4.393E-02
CO-60	#B	-3.9457E-03	-3.9529E-03	2.1132E-01	2.1132E-01	3.506E-02

Sr-85	#A	-5.1952E-03	-5.4821E-03	3.0385E-02	3.0387E-02	3.256E-02
Kr-85	#A	-1.5486E+02	-1.5486E+02	1.0611E+03	1.0611E+03	7.579E+02
Y-88	#F	1.5048E-01	1.5548E-01	3.1507E-02	3.2818E-02	2.817E-02
NB-94	#B	8.0826E-03	8.0826E-03	2.4119E-02	2.4123E-02	2.728E-02
Ag-108M	#B	-7.1402E-05	-7.1408E-05	2.7767E-02	2.7767E-02	3.248E-02
CD-109	#A	2.0013E-01	2.0167E-01	1.3687E+00	1.3688E+00	1.506E+00
SN-113	#B	-8.9049E-03	-9.1786E-03	5.6778E-02	5.6780E-02	4.784E-02
SB-125	#F	5.1056E-01	5.1232E-01	9.4234E-02	9.8972E-02	1.016E-01
I-131	#B	2.7118E-03	4.1833E-03	4.7382E-02	4.7383E-02	3.483E-02
CS-134	#A	-4.2049E-02	-4.2244E-02	4.7830E-02	4.7895E-02	5.049E-02
CS-137	#A	-5.4291E-03	-5.4308E-03	1.0928E-01	1.0928E-01	4.450E-02
CE-139	#A	-1.2901E-02	-1.3232E-02	4.1523E-02	4.1531E-02	4.410E-02
EU-152	#B	5.7737E-03	5.7780E-03	1.1395E-01	1.1395E-01	1.271E-01
EU-154	#B	-2.3699E-02	-2.3726E-02	8.5310E-02	8.5320E-02	9.188E-02
EU-155	#B	9.8648E-02	9.8838E-02	1.5069E-01	1.5079E-01	1.647E-01
HG-203	#F	1.4308E-01	1.5419E-01	7.8503E-02	7.9029E-02	3.609E-02
TL-208	#A	2.3107E-03	2.3107E-03	2.9881E-02	2.9882E-02	3.467E-02
PB-212	#B	-1.1156E-01	-1.1156E-01	1.4543E-01	1.4558E-01	1.318E-01
PB-214	#B	-3.6750E-02	-3.6750E-02	1.0601E-01	1.0603E-01	8.889E-02
BI-212	#B	8.5682E-02	8.5682E-02	2.3487E-01	2.3492E-01	2.638E-01
BI-214	#B	-5.4896E-03	-5.4896E-03	5.7469E-01	5.7469E-01	7.736E-02
RA-224	#A	-7.7000E-01	-7.7000E-01	1.0016E+00	1.0026E+00	1.046E+00
RA-226	#A	-5.7754E-01	-5.7754E-01	1.0391E+00	1.0396E+00	1.141E+00
AC-228	#B	4.5923E-03	4.5923E-03	9.4853E-02	9.4854E-02	1.126E-01
TH-227	#	3.8049E+00	3.8049E+00	4.2461E-01	4.8041E-01	3.414E-01
PA-234	#B	5.8263E-02	5.8263E-02	1.4134E-01	1.4138E-01	1.559E-01
TH-234	#B	1.1369E+00	1.1369E+00	1.1918E+00	1.1934E+00	1.959E+00
AM-241	#A	-2.8195E-02	-2.8196E-02	2.5694E-01	2.5695E-01	2.662E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (1104.7 to 2000.1 keV) 0.0000000E+00 pCi/gm
Total Decayed Activity (1104.7 to 2000.1 keV) 0.0000000E+00 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JPK

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 107F_5SEPT2006_1452.An1

Sample description
FSS-OOL-05-07-004-F

Spectrum Filename: C:\GammaVision\Spectra\107F_5SEPT2006_1452.An1

Acquisition information
Start time: 05-Sep-2006 14:52:37
Live time: 2000
Real time: 2002
Dead time: 0.12 %
Detector ID: 2

Detector system
Det 107- DSPE- 634

Calibration
Filename: D7_1LSa.Clb
Detector 107 Calibration for 1 Liter Sand Marinelli

Energy Calibration
Created: 29-Oct-2004 06:48:53
Zero offset: 0.157 keV
Gain: 0.500 keV/channel
Quadratic: -1.676E-08 keV/channel^2

Efficiency Calibration
Created: 29-Oct-2004 06:51:32
Type: Polynomial
Uncertainty: 1.174 %
Coefficients: -0.279532 -4.778179 0.614896
-0.087174 0.005356 -0.000131

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.16keV)
Stop channel: 4000 (2000.15keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 1.7230E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.7230E+03) =
5.8038E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	31-Aug-2006 13:14:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	107_150K_28APR05.Pbc 01-May-2005 05:30:33
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 8 cutoff 20.00000 %

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
75.05	677.	9.23	3.76	2.861E-02	70.83	3.520	6.199E+00	HG203
					72.87	6.400	3.250E+00	HG203
					74.81	9.600	1.931E+00	PB212
					77.11	10.700	1.667E+00	PB214
					77.11	17.500	1.026E+00	PB212
85.93	156.	36.31	1.22	3.269E-02				
85.93	156.	36.31	1.22	3.269E-02	86.45	32.740	1.139E-01	EU155
91.96	127.	37.85	1.14	3.420E-02				
91.96	127.	37.85	1.14	3.420E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
183.30	171.	26.09	1.88	3.630E-02				
206.87	102.	37.26	1.21	3.448E-02				
235.37	919.	4.62	1.29	3.215E-02				
235.37	919.	4.62	1.29	3.215E-02	236.00	11.200	2.004E+00	TH227
238.30	170.	20.33	1.30	3.192E-02				
238.30	170.	20.33	1.30	3.192E-02	238.63	43.100	PBC<MDA	PB212
266.87	98.	30.54	1.82	2.969E-02				
291.30	203.	11.40	1.33	2.794E-02				
295.74	72.	26.97	1.34	2.764E-02	295.22	19.200	PBC<MDA	PB214
333.33	215.	16.97	1.67	2.529E-02				
346.99	426.	7.45	2.14	2.453E-02				
456.39	63.	32.36	1.60	1.977E-02				
503.66	200.	16.07	1.73	1.828E-02				
575.07	366.	8.11	1.57	1.647E-02				
600.61	316.	8.44	2.14	1.592E-02				
600.61	316.	8.44	2.14	1.592E-02	600.77	18.400	8.450E-01	SB125
652.46	402.	6.59	1.57	1.493E-02				
716.77	102.	22.52	1.67	1.389E-02				
783.38	36.	33.18	1.68	1.297E-02	785.42	2.000	PBC<MDA	BI212

898.51	270.	8.91	2.00	1.173E-02	898.02	94.000	1.975E-01	Y88
954.10	155.	14.60	1.71	1.122E-02				
1440.17	1419.	2.74	2.49	8.279E-03				
1739.78	68.	13.02	2.06	7.163E-03				

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
149.76	75.05	1228.	646.	0.323	25.88	3.756	BI-207	s
171.52	85.93	1171.	156.	0.078	108.94	1.218	BI-207	l
366.25	183.30	649.	197.	0.099	58.84	1.884	MO-99	s
413.37	206.87	537.	102.	0.051	111.78	1.208	U-237	s
470.37	235.43	442.	919.	0.460	13.86	1.295	J-134	D
476.24	238.36	515.	170.	0.085	60.99	1.297	PB-212	D
533.37	266.87	322.	98.	0.049	91.61	1.815	SE-75	s

Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM	Suspected	
582.20	291.29	248.	194.	0.097	40.53	1.362	CE-143	s
591.09	295.73	217.	65.	0.033	102.47	1.742	PB-214	s
666.28	333.33	284.	260.	0.130	33.24	1.675	AU-196	s
693.60	346.99	127.	515.	0.258	16.14	2.136	HF-181	s
912.37	456.39	141.	63.	0.032	97.07	1.602	PA-234	
1006.91	503.66	213.	202.	0.101	37.31	1.733	J-132	s
1149.72	575.07	142.	367.	0.184	20.84	1.573	PA-234	s
1304.50	652.46	100.	402.	0.201	18.31	1.573	SR-91	s
1433.11	716.77	106.	108.	0.054	49.77	1.673	RH-106M	
1907.76	954.10	106.	155.	0.078	36.96	1.711	SB-126	s
2879.94	1440.17	26.	1419.	0.710	8.22	2.493	J-132	s
3479.21	1739.78	3.	68.	0.034	39.06	2.057	KR-87	

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
HG-203	147.64	73.99	1714.	150.	0.075	118.36	1.500s
PB-212	151.61	75.97	1627.	200.	0.100	86.29	1.500s
PB-214	153.89	77.11	1944.	-196.	-0.098	100.13	1.500D
PB-212	153.89	77.11	1939.	-191.	-0.096	100.13	1.500D
TH-227	470.42	235.39	652.	972.	0.486	14.72	1.500s
SB-125	1201.04	600.73	132.	251.	0.126	26.90	1.552s
BI-212	1566.33	783.38	59.	36.	0.018	99.53	1.677s
Y-88	1796.36	898.40	69.	248.	0.124	23.58	1.752s

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	Peak MDA Value pCi/gm	COMMENTS
BE-7		0.0000E+00					
			477.56	0.000E+00	%(	2.736E-01 7.95E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
K-40	-1.6983E-02						
		1460.75	-1.698E-02	&(P	2.325E-01	5.89E-02	G
MN-54	-3.4032E-04						
		834.81	-3.403E-04	%(P	2.160E-02	6.00E-03	G
CO-57	7.9726E-03						
		122.07	7.973E-03	%(P	3.375E-02	1.01E-02	G K
		136.43	-9.847E-03	% P	2.631E-01	7.84E-02	G
CO-60	4.9510E-03						
		1332.51	4.951E-03	%(P	2.699E-02	7.55E-03	G K
		1173.23	-3.231E-03	% P	3.363E-02	9.25E-03	G K
Sr-85	2.5286E-03						
		514.00	2.529E-03	%(	1.777E-02	5.13E-03	G
Kr-85	5.5308E+01						
		513.99	5.531E+01	%(P	4.095E+02	1.17E+02	G
Y-88	8.7522E-02						
		1836.01	-2.267E-03	%(P	2.292E-02	5.92E-03	G K
		898.02	1.824E-01	(P	3.051E-02	1.44E-02	G
NB-94	1.0875E-03						
		871.10	1.087E-03	&(P	2.677E-02	7.63E-03	G K
		702.50	-2.979E-03	& P	2.642E-02	7.64E-03	G K
Ag-108M	-4.1267E-03						
		722.95	-4.127E-03	%(	3.115E-02	9.08E-03	G K
		614.37	-5.527E-03	%	2.829E-02	8.32E-03	G
		433.93	-1.909E-03	& P	2.552E-02	7.39E-03	G
CD-109	-3.0390E-02						
		88.04	-3.039E-02	&(P	1.096E+00	3.28E-01	G
SN-113	5.4381E-03						
		391.71	5.438E-03	%(P	4.015E-02	1.18E-02	G K
		255.04	3.062E-01	%	1.132E+00	3.39E-01	G
SB-125	2.6690E-01						
		427.95	1.299E-02	&(P	7.637E-02	2.24E-02	G K
		600.77	6.753E-01	*(P	1.510E-01	6.09E-02	G
		636.15	-7.722E-03	& P	1.756E-01	4.95E-02	G
		463.51	-4.068E-02	% P	2.570E-01	7.48E-02	G
		176.29	1.200E-01	% P	4.308E-01	1.29E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
I-131	-3.2029E-03						
		364.48	-3.203E-03	&(	4.297E-02	1.26E-02	G K
		636.97	3.530E-02	%	4.888E-01	1.41E-01	G
		284.29	7.504E-03	%	6.032E-01	1.77E-01	G
CS-134	-2.8258E-02						
		604.66	-2.826E-02	%(P	4.029E-02	1.24E-02	G K
		795.76	8.091E-03	% P	2.650E-02	7.81E-03	G
		569.29	4.533E-02	&	9.984E-02	3.02E-02	G
		801.84	-4.437E-04	& P	2.607E-01	7.32E-02	G
CS-137	-5.7513E-03						
		661.62	-5.751E-03	&(P	3.192E-02	9.14E-03	G
CE-139	-4.8322E-03						
		165.85	-4.832E-03	%(P	3.359E-02	1.00E-02	G
EU-152	2.5939E-02						
		121.78	2.594E-02	%(P	9.941E-02	2.99E-02	G K
		344.30	-7.101E-02	% P	1.205E-01	3.67E-02	G
		1408.08	-1.011E-02	& P	1.195E-01	3.27E-02	G
		964.00	-1.612E-03	& P	2.191E-01	6.25E-02	G
		1112.07	-8.156E-02	% P	2.853E-01	8.44E-02	G
		778.90	-8.755E-02	% P	2.392E-01	7.14E-02	G
EU-154	1.5505E-02						
		123.10	1.550E-02	&(P	6.709E-02	2.01E-02	G K
		1274.80	-9.087E-03	& P	8.771E-02	2.49E-02	G
		723.30	-1.035E-03	% P	1.380E-01	3.94E-02	G
		1004.80	2.428E-02	& P	1.772E-01	5.13E-02	G
EU-155	7.2163E-02						
		86.45	7.216E-02	%(	1.218E-01	3.71E-02	G K
		105.31	7.596E-03	& P	1.369E-01	4.08E-02	G
HG-203	4.5169E-02						
		279.17	-7.901E-03	%(P	3.363E-02	1.00E-02	G K
		72.87	7.210E-01	?(P	9.412E-01	2.88E-01	G
		70.83	-5.829E-01	&	1.752E+00	5.29E-01	G
		82.50	-7.175E-03	%	2.067E+00	6.17E-01	G
TL-208	-7.0641E-03						
		583.14	-7.064E-03	%(P	2.688E-02	7.68E-03	G
		510.72	-8.650E-02	& P	1.226E-01	3.26E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
PB-212	7.4854E-02						
		238.63	-3.641E-02	%(P	9.553E-02	2.86E-02	G K
							Energy duplication
		77.11	-2.897E-01	+	3.151E-01	9.67E-02	G
		74.81	5.744E-01	*(P	5.466E-01	1.68E-01	G
PB-214	-4.2890E-02						
		351.99	-4.289E-02	&(P	7.382E-02	2.23E-02	G K
		295.22	-1.717E-02	% P	1.606E-01	4.75E-02	G
							Energy duplication
		77.11	-4.855E-01	+ P	5.160E-01	1.58E-01	G
		241.92	-2.289E-01	% P	3.993E-01	1.21E-01	G
BI-212	1.5168E-01						
		727.17	-6.806E-03	%(P	2.369E-01	6.75E-02	G K
		1620.56	-2.699E-02	& P	8.514E-01	2.25E-01	G
		785.42	1.087E+00	&(P	1.163E+00	3.73E-01	G
BI-214	-3.4854E-03						
		609.32	-3.485E-03	%(P	5.755E-02	1.63E-02	G K
		1764.51	-3.267E-03	& P	1.052E-01	2.49E-02	G
		1120.28	3.874E-02	& P	2.190E-01	6.36E-02	G
RA-224	-5.1633E-01						
		241.00	-5.163E-01	%(P	8.047E-01	2.45E-01	G
RA-226	-1.7367E-01						
		185.99	-1.737E-01	&(	8.744E-01	2.62E-01	G
AC-228	-1.0231E-02						
		911.07	-1.023E-02	%(P	9.628E-02	2.65E-02	G K
		968.90	2.349E-02	% P	1.742E-01	5.01E-02	G
		338.40	-1.345E-01	% P	2.322E-01	7.04E-02	G
TH-227	2.1204E+00						
		236.00	2.120E+00	*(P	2.655E-01	1.04E-01	G K
		256.25	7.187E-02	% P	3.398E-01	1.01E-01	G
PA-234	5.9936E-03						
		98.44	5.994E-03	%(	1.243E-01	3.71E-02	G K
		946.00	-2.133E-03	%	1.595E-01	4.56E-02	G
		131.28	-3.539E-02	%	1.527E-01	4.59E-02	G
		94.67	-8.424E-02	&	2.413E-01	7.29E-02	G
		883.24	0.000E+00	&	2.375E-01	6.75E-02	G
		926.70	0.000E+00	&	2.855E-01	8.15E-02	G
		569.26	6.504E-02	&	1.595E-01	4.79E-02	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments

TH-234      -3.5606E-01
                            63.29-3.561E-01 &(P 1.614E+00 4.81E-01 G K
                            92.80 8.257E-01 % P 1.191E+00 3.62E-01 G
                            92.38 1.056E+00 % P 1.442E+00 4.40E-01 G

AM-241      -4.7617E-04
                            59.54-4.762E-04 %(P 2.123E-01 6.33E-02 G
   ( - This peak used in the nuclide activity average.

   * - Peak is too wide, but only one peak in library.
   ! - Peak is part of a multiplet and this area went
       negative during deconvolution.
   ? - Peak is too narrow.
   @ - Peak is too wide at FW25M, but ok at FWHM.
   % - Peak fails sensitivity test.
   $ - Peak identified, but first peak of this nuclide
       failed one or more qualification tests.
   + - Peak activity higher than counting uncertainty range.
   - - Peak activity lower than counting uncertainty range.
   = - Peak outside analysis energy range.
   & - Calculated peak centroid is not close enough to the
       library energy centroid for positive identification.
   P - Peakbackground subtraction
   } - Peak is too close to another for the activity
       to be found directly.

   Nuclide Codes:                      Peak Codes:
   T - Thermal Neutron Activation      G - Gamma Ray
   F - Fast Neutron Activation         X - X-Ray
   I - Fission Product                 P - Positron Decay
   N - Naturally Occurring Isotope     S - Single-Escape
   P - Photon Reaction                 D - Double-Escape
   C - Charged Particle Reaction       K - Key Line
   M - No MDA Calculation              A - Not in Average
   R - Coincidence Corrected           C - Coincidence Peak
   H - Halflife limit exceeded

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
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***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	0.0000E+00	0.0000E+00	2.3858E-01	2.3858E-01	2.562E-01
K-40	#A	-1.6983E-02	-1.6983E-02	4.1330E-01	4.1330E-01	2.325E-01
MN-54	#A	-3.3651E-04	-3.4032E-04	1.6876E-01	1.6876E-01	2.136E-02
CO-57	#B	7.8696E-03	7.9726E-03	3.0414E-02	3.0417E-02	3.332E-02
CO-60	#B	4.9419E-03	4.9510E-03	2.2649E-02	2.2651E-02	2.694E-02
Sr-85	#A	2.3952E-03	2.5286E-03	1.5382E-02	1.5382E-02	1.683E-02

Kr-85	#A	5.5306E+01	5.5308E+01	3.5108E+02	3.5110E+02	4.095E+02
Y-88	#F	8.4685E-02	8.7522E-02	2.0765E-02	2.1399E-02	2.218E-02
NB-94	#B	1.0875E-03	1.0875E-03	2.2892E-02	2.2892E-02	2.677E-02
Ag-108M	#B	-4.1264E-03	-4.1267E-03	2.7241E-02	2.7242E-02	3.115E-02
CD-109	#A	-3.0155E-02	-3.0390E-02	1.1224E+00	1.1224E+00	1.088E+00
SN-113	#B	5.2746E-03	5.4381E-03	3.5481E-02	3.5482E-02	3.895E-02
SB-125	#F	2.6597E-01	2.6690E-01	7.2192E-02	7.3893E-02	7.610E-02
I-131	#B	-2.0690E-03	-3.2029E-03	3.7804E-02	3.7804E-02	2.776E-02
CS-134	#B	-2.8126E-02	-2.8258E-02	3.7872E-02	3.7909E-02	4.011E-02
CS-137	#A	-5.7495E-03	-5.7513E-03	6.1828E-02	6.1829E-02	3.191E-02
CE-139	#A	-4.7103E-03	-4.8322E-03	3.1270E-02	3.1271E-02	3.274E-02
EU-152	#B	2.5919E-02	2.5939E-02	8.9680E-02	8.9691E-02	9.933E-02
EU-154	#B	1.5487E-02	1.5505E-02	6.0400E-02	6.0406E-02	6.701E-02
EU-155	#B	7.2023E-02	7.2163E-02	1.1127E-01	1.1134E-01	1.216E-01
HG-203	#F	4.1888E-02	4.5169E-02	5.4071E-02	5.4136E-02	3.119E-02
TL-208	#A	-7.0641E-03	-7.0641E-03	4.8918E-02	4.8920E-02	2.688E-02
PB-212	#B	7.4854E-02	7.4854E-02	6.5836E-02	6.5985E-02	9.553E-02
PB-214	#B	-4.2890E-02	-4.2890E-02	8.2290E-02	8.2329E-02	7.382E-02
BI-212	#B	1.5168E-01	1.5168E-01	1.5627E-01	1.5653E-01	2.369E-01
BI-214	#B	-3.4854E-03	-3.4854E-03	3.3430E-01	3.3430E-01	5.755E-02
RA-224	#A	-5.1633E-01	-5.1633E-01	7.7713E-01	7.7773E-01	8.047E-01
RA-226	#A	-1.7367E-01	-1.7367E-01	7.8632E-01	7.8639E-01	8.744E-01
AC-228	#B	-1.0231E-02	-1.0231E-02	4.3344E+00	4.3344E+00	9.628E-02
TH-227	#	2.1204E+00	2.1204E+00	3.1219E-01	3.3637E-01	2.655E-01
PA-234	#B	5.9936E-03	5.9936E-03	1.1118E-01	1.1118E-01	1.243E-01
TH-234	#B	-3.5606E-01	-3.5606E-01	3.5758E+00	3.5759E+00	1.614E+00
AM-241	#A	-4.7616E-04	-4.7617E-04	6.6097E-01	6.6097E-01	2.123E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (266.7 to 2000.1 keV) 0.0000000E+00 pCi/gm
Total Decayed Activity (266.7 to 2000.1 keV) 0.0000000E+00 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JPK

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 107F_5SEPT2006_1540.An1

Sample description
FSS-OOL-05-07-011-F

Spectrum Filename: C:\GammaVision\Spectra\107F_5SEPT2006_1540.An1

Acquisition information
Start time: 05-Sep-2006 15:40:33
Live time: 2000
Real time: 2002
Dead time: 0.10 %
Detector ID: 2

Detector system
Det 107- DSPE- 634

Calibration
Filename: D7_1LSa.Clb
Detector 107 Calibration for 1 Liter Sand Marinelli

Energy Calibration
Created: 29-Oct-2004 06:48:53
Zero offset: 0.157 keV
Gain: 0.500 keV/channel
Quadratic: -1.676E-08 keV/channel^2

Efficiency Calibration
Created: 29-Oct-2004 06:51:32
Type: Polynomial
Uncertainty: 1.174 %
Coefficients: -0.279532 -4.778179 0.614896
-0.087174 0.005356 -0.000131

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.16keV)
Stop channel: 4000 (2000.15keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 9.9800E+02
Activity scaling factor: 1.0000E+06/(1.0000E+00* 9.9800E+02) =
1.0020E+03
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit:	12.000
Activity range factor:	2.000
Min. step backg. energy	0.000
Multiplet shift channel	2.000

Corrections	Status	Comments
Decay correct to date:	YES	31-Aug-2006 14:11:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	107_150K_28APR05.Pbc 01-May-2005 05:30:33
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 4 cutoff 20.00000 %

Energy Calibration

Normalized diff: 1.0000

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
73.87	202.	16.71	1.18	2.790E-02	72.87	6.400	1.660E+00	HG203
75.96	292.	12.54	1.18	2.896E-02	74.81	9.600	1.427E+00	PB212
91.04	130.	30.70	1.45	3.399E-02				
91.04	130.	30.70	1.45	3.399E-02	92.38	2.570	1.867E+00	TH234
183.12	94.	29.32	1.49	3.631E-02				
235.73	944.	4.84	1.66	3.213E-02				
235.73	944.	4.84	1.66	3.213E-02	236.00	11.200	3.552E+00	TH227
266.55	76.	33.17	1.50	2.972E-02				
291.15	144.	14.24	1.33	2.796E-02				
333.90	205.	13.83	1.91	2.526E-02				
333.90	205.	13.83	1.91	2.526E-02	338.40	12.010	9.099E-01	AC228
346.94	280.	9.51	1.87	2.453E-02				
503.88	175.	15.66	1.99	1.828E-02				
575.25	286.	8.68	1.84	1.646E-02				
600.74	268.	8.74	2.11	1.592E-02				
600.74	268.	8.74	2.11	1.592E-02	600.77	18.400	1.237E+00	SB125
652.35	912.	4.08	1.83	1.493E-02				
898.46	202.	10.25	1.54	1.173E-02	898.02	94.000	2.546E-01	Y88
954.71	172.	10.72	1.91	1.121E-02				
1440.24	735.	3.84	2.51	8.278E-03				

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
147.40	73.67	466.	202.	0.101	50.14	1.177	BI-207	D

151.59	75.76	525.	292.	0.146	37.61	1.179	PB-214	D
365.89	183.12	269.	126.	0.063	61.53	1.493	MO-99	s
471.10	235.73	1083.	217.	0.109	67.41	1.656	J-134	s
532.73	266.55	218.	76.	0.038	99.51	1.501	SE-75	
581.80	291.09	200.	156.	0.078	45.40	1.517	CE-143	s
667.41	333.90	135.	257.	0.128	26.83	1.908	NP-239	s
693.50	346.94	115.	318.	0.159	22.09	1.874	HF-181	s
1007.35	503.88	158.	161.	0.080	40.77	1.995	J-132	s
1150.08	575.25	81.	294.	0.147	21.77	1.840	PA-234	s
1304.27	652.35	98.	919.	0.460	10.90	1.833	SR-91	s
1908.98	954.71	37.	177.	0.088	26.87	1.906	J-132	s
2880.07	1440.24	16.	735.	0.367	11.51	2.510	J-132	

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-212	151.63	75.98	1067.	198.	0.099	71.59	1.500s
PB-212	153.89	77.11	1236.	-137.	-0.068	111.95	1.500D
PB-214	153.89	77.11	1241.	-142.	-0.071	111.95	1.500D
TH-234	182.76	91.55	600.	105.	0.052	95.88	1.500s
TH-227	470.29	235.33	395.	726.	0.363	16.08	1.500s
SB-125	1201.25	600.83	71.	214.	0.107	26.24	1.552s
Y-88	1796.38	898.41	47.	155.	0.078	30.13	1.752s

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	Peak MDA Value pCi/gm	COMMENTS
BE-7		5.8143E-02					
			477.56	5.814E-02	&(	3.026E-01 8.82E-02	G
K-40		-1.3052E-02					
			1460.75	-1.305E-02	%(P	3.140E-01 7.41E-02	G
MN-54		5.4215E-04					
			834.81	5.421E-04	%(P	3.327E-02 9.19E-03	G
CO-57		-6.2735E-03					
			122.07	-6.274E-03	&(P	4.754E-02 1.42E-02	G K
			136.43	-6.584E-03	& P	3.571E-01 1.06E-01	G
CO-60		-7.8816E-03					
			1332.51	-7.882E-03	&(P	3.762E-02 9.39E-03	G K
			1173.23	7.250E-03	& P	5.212E-02 1.47E-02	G K

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
Sr-85	-3.5092E-04						
		514.00	-3.509E-04	%(	3.261E-02	9.25E-03	G
Kr-85	-4.8147E+01						
		513.99	-4.815E+01	%(P	7.414E+02	2.06E+02	G
Y-88	9.2919E-02						
		1836.01	-5.498E-03	%(P	3.781E-02	9.84E-03	G K
		898.02	1.969E-01	@(P	4.402E-02	2.00E-02	G
NB-94	-1.5347E-04						
		871.10	-1.535E-04	&(P	3.895E-02	1.09E-02	G K
		702.50	-1.592E-03	% P	3.410E-02	9.56E-03	G K
Ag-108M	5.2530E-05						
		722.95	5.253E-05	%(	3.866E-02	1.08E-02	G K
		614.37	9.658E-03	%	3.662E-02	1.08E-02	G
		433.93	8.620E-03	% P	4.005E-02	1.18E-02	G
CD-109	-3.4630E-03						
		88.04	-3.463E-03	&(P	1.577E+00	4.70E-01	G
SN-113	-3.0566E-03						
		391.71	-3.057E-03	&(P	5.772E-02	1.66E-02	G K
		255.04	3.565E-03	&	1.444E+00	4.20E-01	G
SB-125	3.5543E-01						
		427.95	-4.065E-02	%(P	1.321E-01	3.92E-02	G K
		600.77	9.926E-01	@(P	1.948E-01	8.74E-02	G
		636.15	-2.713E-02	% P	2.702E-01	7.61E-02	G
		463.51	-8.581E-02	& P	3.973E-01	1.16E-01	G
		176.29	-1.184E-01	% P	5.856E-01	1.74E-01	G
I-131	-1.5518E-02						
		364.48	-1.552E-02	&(	7.151E-02	2.12E-02	G K
		636.97	3.324E-03	%	5.621E-01	1.55E-01	G
		284.29	1.007E-01	&	7.980E-01	2.35E-01	G
CS-134	3.0826E-03						
		604.66	3.083E-03	%(P	5.234E-02	1.52E-02	G K
		795.76	1.177E-02	% P	3.606E-02	1.06E-02	G
		569.29	-4.432E-02	%	2.433E-01	7.12E-02	G
		801.84	6.607E-03	% P	3.076E-01	8.36E-02	G
CS-137	-1.1728E-02						
		661.62	-1.173E-02	&(P	4.263E-02	1.21E-02	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments

CE-139      -9.0221E-03
                          165.85-9.022E-03 %(P 4.763E-02 1.42E-02 G

EU-152      -3.0508E-03
                          121.78-3.051E-03 &(P 1.345E-01 3.98E-02 G K
                          344.30-7.045E-02 % P 1.878E-01 5.65E-02 G
                         1408.08 5.575E-03 & P 1.664E-01 4.43E-02 G
                          964.00-6.407E-02 & P 2.723E-01 7.91E-02 G
                         1112.07-6.334E-02 & P 3.851E-01 1.11E-01 G
                          778.90-9.517E-02 % P 3.456E-01 1.02E-01 G

EU-154      -1.4287E-02
                          123.10-1.429E-02 &(P 9.815E-02 2.93E-02 G K
                         1274.80-1.411E-03 & P 1.166E-01 3.17E-02 G
                          723.30-2.412E-03 % P 1.697E-01 4.72E-02 G
                         1004.80 4.081E-02 & P 1.845E-01 5.29E-02 G

EU-155       6.5740E-02
                           86.45 6.574E-02 &(  1.621E-01 4.90E-02 G K
                          105.31 4.164E-02 % P 1.777E-01 5.32E-02 G

HG-203      -7.5607E-03
                          279.17-7.561E-03 %(P 3.900E-02 1.15E-02 G K
                           72.87 9.522E-01 & P 1.355E+00 4.14E-01 G
                           70.83-9.863E-01 %   2.516E+00 7.61E-01 G
                           82.50-4.481E-01 %   2.570E+00 7.69E-01 G

TL-208      -3.7820E-03
                          583.14-3.782E-03 %(P 3.785E-02 1.03E-02 G
                          510.72-6.453E-02 % P 1.707E-01 4.26E-02 G

PB-212       1.1070E-01
                          238.63-8.335E-02 %(P 1.416E-01 4.26E-02 G K
                                                           Energy duplication
                           77.11-3.581E-01 +   4.358E-01 1.34E-01 G
                           74.81 9.819E-01 *(P 7.669E-01 2.39E-01 G

PB-214      -3.7943E-02
                          351.99-3.794E-02 %(P 9.927E-02 2.93E-02 G K
                          295.22-2.613E-02 % P 2.400E-01 7.06E-02 G
                                                           Energy duplication
                           77.11-6.061E-01 + P 7.141E-01 2.19E-01 G
                          241.92-2.391E-01 % P 5.353E-01 1.62E-01 G

BI-212      -5.2334E-02
                          727.17-5.233E-02 &(P 3.226E-01 9.20E-02 G K
                         1620.56-2.222E-01 & P 1.359E+00 3.70E-01 G
                          785.42 1.067E+00 % P 1.728E+00 5.33E-01 G
```

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments

BI-214       8.4454E-03
                          609.32 8.445E-03 %(P 6.824E-02 1.92E-02 G K
                         1764.51 5.192E-03 % P 1.817E-01 4.45E-02 G
                         1120.28-2.406E-02 % P 2.552E-01 7.00E-02 G

RA-224      -5.4225E-01
                          241.00-5.422E-01 &(P 1.102E+00 3.33E-01 G

RA-226      -4.8098E-01
                          185.99-4.810E-01 &(  1.251E+00 3.78E-01 G

AC-228      -1.7028E-02
                          911.07-1.703E-02 &(P 1.535E-01 4.17E-02 G K
                          968.90 3.245E-02 & P 1.822E-01 5.07E-02 G
                          338.40-2.484E-01 % P 3.447E-01 1.05E-01 G

TH-227       2.7341E+00
                          236.00 2.734E+00 *(P 3.590E-01 1.47E-01 G K
                          256.25-1.364E-02 & P 4.240E-01 1.23E-01 G

PA-234       4.2022E-02
                           98.44 4.202E-02 %(  1.625E-01 4.87E-02 G K
                          946.00-3.948E-02 %   2.196E-01 6.36E-02 G
                          131.28-4.786E-02 %   1.913E-01 5.74E-02 G
                           94.67-1.372E-01 %   3.052E-01 9.24E-02 G
                          883.24 5.414E-02 &   2.599E-01 7.46E-02 G
                          926.70-3.508E-02 %   3.591E-01 1.02E-01 G
                          569.26-6.488E-02 %   3.592E-01 1.05E-01 G

TH-234       1.0611E+00
                           63.29 6.999E-01 %(P 1.912E+00 5.73E-01 G K
                           92.80-1.339E+00 % P 1.769E+00 5.33E-01 G
                           92.38 1.609E+00 &(P 1.796E+00 5.53E-01 G

AM-241      -7.1738E-02
                           59.54-7.174E-02 %(P 2.964E-01 8.89E-02 G
   ( - This peak used in the nuclide activity average.

   * - Peak is too wide, but only one peak in library.
   ! - Peak is part of a multiplet and this area went
       negative during deconvolution.
   ? - Peak is too narrow.
   @ - Peak is too wide at FW25M, but ok at FWHM.
   % - Peak fails sensitivity test.
   $ - Peak identified, but first peak of this nuclide
       failed one or more qualification tests.
```

+ - Peak activity higher than counting uncertainty range.
- - Peak activity lower than counting uncertainty range.
= - Peak outside analysis energy range.
& - Calculated peak centroid is not close enough to the library energy centroid for positive identification.
P - Peakbackground subtraction
} - Peak is too close to another for the activity to be found directly.

Nuclide Codes:
T - Thermal Neutron Activation
F - Fast Neutron Activation
I - Fission Product
N - Naturally Occurring Isotope
P - Photon Reaction
C - Charged Particle Reaction
M - No MDA Calculation
R - Coincidence Corrected
H - Halflife limit exceeded

Peak Codes:
G - Gamma Ray
X - X-Ray
P - Positron Decay
S - Single-Escape
D - Double-Escape
K - Key Line
A - Not in Average
C - Coincidence Peak

- -

***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	5.4445E-02	5.8143E-02	2.6472E-01	2.6474E-01	2.834E-01
K-40	#A	-1.3052E-02	-1.3052E-02	3.1902E-01	3.1903E-01	3.140E-01
MN-54	#A	5.3609E-04	5.4215E-04	2.7573E-02	2.7573E-02	3.290E-02
CO-57	#B	-6.1925E-03	-6.2735E-03	4.4110E-02	4.4111E-02	4.692E-02
CO-60	#B	-7.8672E-03	-7.8816E-03	1.8701E-01	1.8701E-01	3.755E-02
Sr-85	#A	-3.3243E-04	-3.5092E-04	2.7758E-02	2.7758E-02	3.089E-02
Kr-85	#A	-4.8146E+01	-4.8147E+01	1.4742E+04	1.4742E+04	7.413E+02
Y-88	#F	8.9910E-02	9.2919E-02	2.8276E-02	2.8803E-02	3.658E-02
NB-94	#B	-1.5347E-04	-1.5347E-04	8.8768E-03	8.8768E-03	3.895E-02
Ag-108M	#B	5.2526E-05	5.2530E-05	3.2532E-02	3.2532E-02	3.866E-02
CD-109	#A	-3.4363E-03	-3.4630E-03	9.0131E-01	9.0131E-01	1.564E+00
SN-113	#B	-2.9648E-03	-3.0566E-03	1.8697E-01	1.8697E-01	5.599E-02
SB-125	#F	3.5420E-01	3.5543E-01	9.3855E-02	9.6174E-02	1.316E-01
I-131	#B	-1.0030E-02	-1.5518E-02	6.3622E-02	6.3629E-02	4.622E-02
CS-134	#B	3.0683E-03	3.0826E-03	4.5712E-02	4.5712E-02	5.210E-02
CS-137	#A	-1.1724E-02	-1.1728E-02	7.1235E-02	7.1238E-02	4.262E-02
CE-139	#A	-8.7947E-03	-9.0221E-03	4.4164E-02	4.4167E-02	4.643E-02
EU-152	#B	-3.0485E-03	-3.0508E-03	1.3354E-01	1.3354E-01	1.344E-01
EU-154	#B	-1.4271E-02	-1.4287E-02	9.3826E-02	9.3830E-02	9.804E-02
EU-155	#B	6.5612E-02	6.5740E-02	1.4704E-01	1.4709E-01	1.618E-01
HG-203	#B	-7.0122E-03	-7.5607E-03	4.2602E-02	4.2604E-02	3.617E-02
TL-208	#A	-3.7820E-03	-3.7820E-03	4.1715E-01	4.1715E-01	3.785E-02
PB-212	#B	1.1070E-01	1.1070E-01	8.0786E-02	8.1051E-02	1.416E-01
PB-214	#B	-3.7943E-02	-3.7943E-02	1.3245E-01	1.3247E-01	9.927E-02
BI-212	#B	-5.2334E-02	-5.2334E-02	4.1847E-01	4.1849E-01	3.226E-01

BI-214 #B	8.4454E-03	8.4454E-03	5.7577E-02	5.7579E-02	6.824E-02

RA-224	#A	-5.4225E-01	-5.4225E-01	1.0940E+00	1.0945E+00	1.102E+00
RA-226	#A	-4.8098E-01	-4.8098E-01	1.1327E+00	1.1331E+00	1.251E+00
AC-228	#B	-1.7028E-02	-1.7028E-02	1.0586E+00	1.0586E+00	1.535E-01
TH-227	#	2.7341E+00	2.7341E+00	4.3987E-01	4.6857E-01	3.590E-01
PA-234	#B	4.2022E-02	4.2022E-02	1.4616E-01	1.4618E-01	1.625E-01
TH-234	#B	1.0611E+00	1.0611E+00	1.0948E+00	1.0964E+00	1.912E+00
AM-241	#A	-7.1737E-02	-7.1738E-02	2.7806E-01	2.7809E-01	2.964E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (90.7 to 2000.1 keV) 0.0000000E+00 pCi/gm
Total Decayed Activity (90.7 to 2000.1 keV) 0.0000000E+00 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JPK

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 101F_11SEPT2006_1531.An1

Sample description
OOL-05-08-016-F-S WET

Spectrum Filename: C:\GammaVision\Spectra\101F_11SEPT2006_1531.An1

Acquisition information
Start time: 11-Sep-2006 15:31:09
Live time: 2000
Real time: 2002
Dead time: 0.10 %
Detector ID: 1

Detector system
Det 101- DSPE-633

Calibration
Filename: D1_1LSa.Clb
Detector 101 1.0 Liter Marinelli Sand

Energy Calibration
Created: 03-Sep-2004 08:50:48
Zero offset: 0.244 keV
Gain: 0.500 keV/channel
Quadratic: -2.493E-08 keV/channel^2

Efficiency Calibration
Created: 03-Sep-2004 08:52:26
Type: Polynomial
Uncertainty: 0.626 %
Coefficients: -0.321775 -5.816463 0.734234
-0.099357 0.006049 -0.000149

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.23keV)
Stop channel: 4000 (1999.11keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 2.7000E+01
Activity scaling factor: 1.0000E+06/(1.0000E+00* 2.7000E+01) =
3.7037E+04
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	11-Sep-2006 13:22:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	101_150K_28APR05.Pbc 01-May-2005 05:24:47
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 14 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.1166

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
74.81	161.	28.87	1.50	1.654E-02				
74.81	161.	28.87	1.50	1.654E-02	74.81	9.600	5.061E+01	PB212
77.05	285.	16.24	1.50	1.720E-02	77.11	17.500	4.734E+01	PB212
					77.11	10.700	7.641E+01	PB214
77.05	281.	16.24	1.50	1.720E-02	77.11	17.500	4.672E+01	PB212
					77.11	10.700	7.641E+01	PB214
92.98	135.	26.69	1.50	2.008E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
					94.67	15.500	2.164E+01	PA234
93.01	124.	31.46	1.50	1.989E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
					94.67	15.500	PBC<MDA	PA234
93.03	119.	32.07	1.50	1.985E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
					94.67	15.500	PBC<MDA	PA234
128.97	92.	37.20	0.93	2.110E-02				
186.22	143.	20.82	1.41	1.857E-02	185.99	3.280	1.176E+02	RA226
209.15	69.	37.32	1.21	1.722E-02				
238.85	770.	4.20	1.12	1.557E-02	238.63	43.100	5.694E+01	PB212
241.69	127.	18.11	1.12	1.542E-02	241.00	3.900	1.052E+02	RA224
					241.92	7.470	5.513E+01	PB214
269.87	113.	23.62	1.34	1.402E-02				
277.89	54.	32.16	0.63	1.366E-02				
277.89	54.	32.16	0.63	1.366E-02	279.17	81.500	2.419E+00	HG203
295.22	172.	16.59	1.06	1.292E-02				
295.22	172.	16.59	1.06	1.292E-02	295.22	19.200	3.426E+01	PB214
338.32	144.	11.98	1.45	1.135E-02	338.40	12.010	5.218E+01	AC228

351.98	291.	10.35	1.33	1.092E-02				
351.98	291.	10.35	1.33	1.092E-02	351.99	37.100	3.574E+01	PB214
409.39	53.	33.34	0.71	9.422E-03				
463.15	55.	32.38	0.89	8.348E-03				
463.15	55.	32.38	0.89	8.348E-03	463.51	10.000	3.195E+01	SB125
511.05	75.	22.71	1.26	7.586E-03	510.72	22.500	1.731E+01	TL208
583.20	239.	10.30	1.42	6.684E-03	583.14	86.000	2.060E+01	TL208
609.36	203.	10.75	1.09	6.412E-03	609.32	46.090	3.412E+01	BI214

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
728.20	65.	21.26	1.45	5.436E-03	727.17	11.800	5.012E+01	BI212
860.76	45.	26.32	0.87	4.676E-03				
911.29	128.	11.00	1.32	4.446E-03	911.07	29.000	4.915E+01	AC228
964.47	37.	26.76	1.61	4.229E-03	964.00	14.580	PBC<MDA	EU152
969.15	84.	13.11	1.62	4.212E-03	968.90	17.460	5.646E+01	AC228
1120.08	43.	34.34	1.10	3.711E-03	1120.28	15.040	3.822E+01	BI214
1460.79	612.	4.25	1.80	2.942E-03	1460.75	10.700	9.688E+02	K40
1619.93	10.	37.46	1.07	2.682E-03	1620.56	2.750	6.990E+01	BI212
1764.94	26.	19.61	1.04	2.481E-03	1764.51	15.920	3.239E+01	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
257.55	128.97	470.	97.	0.048	99.74	0.934	AC-228	s
417.98	209.15	270.	69.	0.034	111.95	1.208	AC-228	s
477.41	238.79	138.	769.	0.385	12.61	1.122	PB-212	D
539.46	269.87	212.	113.	0.056	70.86	1.339	AC-228	
555.50	277.89	116.	54.	0.027	96.48	0.629	NP-239	l
818.63	409.39	95.	53.	0.026	100.01	0.705	AC-228	s
1721.82	860.76	32.	45.	0.022	78.95	0.868	TL-208	s
1929.66	964.38	27.	40.	0.020	73.25	1.613	AC-228	D

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-212	149.19	74.81	1068.	161.	0.080	86.62	1.499s
PB-212	153.79	77.11	927.	285.	0.142	48.72	1.499D
PB-214	153.79	77.11	931.	281.	0.141	48.72	1.499D
TH-234	185.65	93.03	810.	119.	0.059	96.20	1.499s
TH-234	185.60	93.01	779.	124.	0.062	94.38	1.499s
PA-234	185.55	92.98	578.	135.	0.067	80.06	1.499s
RA-226	371.86	186.10	388.	130.	0.065	69.63	1.499s
PB-212	477.32	238.81	372.	605.	0.303	17.99	1.499
RA-224	481.70	241.00	500.	101.	0.050	98.02	1.123D
PB-214	483.26	241.78	404.	116.	0.058	77.83	1.499s
PB-214	590.19	295.22	203.	151.	0.076	46.25	1.499D
AC-228	676.42	338.32	76.	142.	0.071	35.95	1.454s
PB-214	703.91	352.06	127.	253.	0.126	26.45	1.499

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
SB-125	925.71	462.91	67.	44.	0.022	87.42	1.499
TL-208	1022.04	511.05	96.	59.	0.030	68.12	1.265s
TL-208	1166.41	583.20	110.	237.	0.118	30.91	1.424
BI-214	1218.75	609.36	77.	201.	0.101	32.24	1.086
BI-212	1456.56	728.20	43.	64.	0.032	63.79	1.454s
AC-228	1822.93	911.29	30.	127.	0.063	33.00	1.317
AC-228	1938.21	968.90	19.	83.	0.042	39.28	1.616D
BI-214	2240.75	1120.08	50.	43.	0.021	103.01	1.099s
K-40	2922.60	1460.79	15.	609.	0.305	12.74	1.801
BI-212	3241.10	1619.93	2.	10.	0.005	112.39	1.066s
BI-214	3531.31	1764.94	0.	26.	0.013	58.83	1.037s

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	Peak MDA Value pCi/gm	COMMENTS
BE-7		-3.5540E+00					
			477.56	-3.554E+00	%(	2.778E+01 8.07E+00	G
K-40		9.6878E+02					
			1460.75	9.688E+02	(P	3.259E+01 4.13E+01	G
MN-54		-4.5655E-01					
			834.81	-4.565E-01	%(P	3.657E+00 1.04E+00	G
CO-57		5.0035E-03					
			122.07	5.003E-03	%(	2.994E+00 8.86E-01	G K
			136.43	4.456E-01	%	2.769E+01 8.22E+00	G
CO-60		-6.5142E-02					
			1332.51	-6.514E-02	&(P	3.433E+00 9.15E-01	G K
			1173.23	-1.339E-01	% P	4.513E+00 1.26E+00	G K
Sr-85		-1.0716E+00					
			514.00	-1.072E+00	%(	3.705E+00 1.10E+00	G
Kr-85		-2.6533E+04					
			513.99	-2.653E+04	%(P	8.582E+04 2.54E+04	G
Y-88		-3.4622E-01					
			1836.01	-3.462E-01	%(	3.090E+00 8.11E-01	G K
			898.02	-2.637E-01	& P	3.216E+00 8.92E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
NB-94	-6.4496E-01						
		871.10	-6.450E-01	%(P	3.347E+00	9.61E-01	G K
		702.50	-5.209E-01	% P	3.893E+00	1.13E+00	G K
Ag-108M	1.2010E-01						
		722.95	1.201E-01	%(	3.957E+00	1.12E+00	G K
		614.37	-6.778E-01	% P	3.429E+00	9.98E-01	G
		433.93	-2.899E-01	%	3.147E+00	9.13E-01	G
CD-109	9.7992E+00						
		88.04	9.799E+00	%(P	9.375E+01	2.80E+01	G
SN-113	2.7419E-01						
		391.71	2.742E-01	%(	4.291E+00	1.25E+00	G K
		255.04	-2.807E+01	% P	1.343E+02	4.00E+01	G
SB-125	7.6609E+00						
		427.95	1.286E+00	%(P	9.119E+00	2.66E+00	G K
		600.77	-3.654E+00	% P	1.693E+01	4.94E+00	G
		636.15	-2.062E-01	% P	2.752E+01	7.74E+00	G
		463.51	2.653E+01	(P	2.454E+01	7.98E+00	G
		176.29	-5.741E+00	% P	4.417E+01	1.31E+01	G
I-131	-6.6560E-01						
		364.48	-6.656E-01	%(	3.176E+00	9.37E-01	G K
		636.97	-7.737E-01	%	4.084E+01	1.15E+01	G
		284.29	-1.325E+00	%	4.394E+01	1.29E+01	G
CS-134	2.8961E-01						
		604.66	2.896E-01	%(P	3.092E+00	8.84E-01	G K
		795.76	2.568E+00	% P	3.698E+00	1.16E+00	G
		569.29	6.673E+00	% P	1.649E+01	4.94E+00	G
		801.84	1.106E+01	&	3.283E+01	9.70E+00	G
CS-137	1.5647E+00						
		661.62	1.565E+00	%(P	3.146E+00	9.53E-01	G
CE-139	-4.1179E-01						
		165.85	-4.118E-01	%(P	3.467E+00	1.03E+00	G
EU-152	-6.3469E-02						
		121.78	-6.347E-02	%(P	1.001E+01	2.97E+00	G K
		344.30	3.390E+00	% P	8.306E+00	2.50E+00	G
		1408.08	2.539E+00	% P	1.240E+01	3.41E+00	G
		964.00	2.288E+00	& P	4.227E+01	1.22E+01	G
		1112.07	6.831E+00	% P	2.802E+01	8.11E+00	G
		778.90	-3.040E-02	% P	2.291E+01	6.33E+00	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
EU-154	-1.3023E+00						
		123.10	-1.302E+00	%(P	7.473E+00	2.23E+00	G K
		1274.80	6.377E-01	% P	1.173E+01	3.25E+00	G
		723.30	2.848E-01	& P	1.574E+01	4.40E+00	G
		1004.80	-3.230E+00	% P	2.328E+01	6.66E+00	G
EU-155	8.1412E+00						
		86.45	8.141E+00	%(	1.156E+01	3.54E+00	G K
		105.31	5.925E+00	%	1.409E+01	4.26E+00	G
HG-203	1.8249E+00						
		279.17	1.825E+00	&(	2.816E+00	8.66E-01	G K
		72.87	-3.548E+01	& P	8.538E+01	2.58E+01	G
		70.83	1.850E+01	%	1.067E+02	3.19E+01	G
		82.50	-5.791E+01	%	1.754E+02	5.29E+01	G
TL-208	1.9919E+01						
		583.14	2.060E+01	(P	4.498E+00	2.14E+00	G
		510.72	1.731E+01	*(P	1.417E+01	5.00E+00	G
PB-212	4.6425E+01						
		238.63	4.512E+01	(P	6.905E+00	2.73E+00	G K
							Energy duplication
		77.11	4.734E+01	(	2.404E+01	7.69E+00	G
		74.81	5.061E+01	&(P	4.886E+01	1.51E+01	G
PB-214	3.0990E+01						
		351.99	3.124E+01	(P	6.826E+00	2.78E+00	G K
							Energy duplication
		295.22	3.051E+01	(P	1.395E+01	4.76E+00	G
							Energy duplication
		77.11	7.641E+01	+ P	3.939E+01	1.26E+01	G
		241.92	5.066E+01	+ P	4.192E+01	1.32E+01	G
BI-212	5.3862E+01						
		727.17	5.012E+01	*(P	2.584E+01	1.08E+01	G K
		1620.56	6.990E+01	(	5.963E+01	2.62E+01	G
		785.42	6.341E+01	% P	1.619E+02	4.84E+01	G
BI-214	3.4562E+01						
		609.32	3.412E+01	(P	7.361E+00	3.69E+00	G K
		1764.51	3.239E+01	(P	9.338E+00	6.46E+00	G
		1120.28	3.822E+01	(P	3.209E+01	1.32E+01	G
RA-224	8.3743E+01						
		241.00	8.374E+01	(P	8.883E+01	2.76E+01	G
RA-226	1.0648E+02						
		185.99	1.065E+02	*(	7.761E+01	2.47E+01	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments

AC-228       5.1970E+01
                          911.07 4.915E+01  (P 1.102E+01 5.49E+00 G K
                          968.90 5.651E+01  (P 1.566E+01 7.46E+00 G
                          338.40 5.218E+01  (P 1.590E+01 6.35E+00 G

TH-227      -4.1855E+00
                          236.00-4.185E+00 %(P 3.001E+01 8.94E+00 G K
                          256.25-9.376E+00 % P 3.776E+01 1.12E+01 G

PA-234       4.8396E+00
                           98.44-5.537E+00 %(  1.145E+01 3.47E+00 G K
                          946.00 6.589E+00 &   1.891E+01 5.61E+00 G
                          131.28-3.096E+00 %   1.509E+01 4.52E+00 G
                           94.67 2.164E+01 ?(  1.845E+01 5.78E+00 G
                          883.24-5.936E+00 %   2.840E+01 8.21E+00 G
                          926.70-3.758E+00 %   3.129E+01 8.86E+00 G
                          569.26 1.021E+01 %   2.436E+01 7.32E+00 G

TH-234       9.2186E+01
                           63.29 6.711E+01 %(P 1.501E+02 4.54E+01 G K
                           92.80 1.039E+02 &(P 1.114E+02 3.43E+01 G
                           92.38 1.165E+02 &(P 1.328E+02 4.08E+01 G

AM-241      -6.1215E+00
                           59.54-6.121E+00 &(P 2.224E+01 6.69E+00 G
   ( - This peak used in the nuclide activity average.

   * - Peak is too wide, but only one peak in library.
   ! - Peak is part of a multiplet and this area went
       negative during deconvolution.
   ? - Peak is too narrow.
   @ - Peak is too wide at FW25M, but ok at FWHM.
   % - Peak fails sensitivity test.
   $ - Peak identified, but first peak of this nuclide
       failed one or more qualification tests.
   + - Peak activity higher than counting uncertainty range.
   - - Peak activity lower than counting uncertainty range.
   = - Peak outside analysis energy range.
   & - Calculated peak centroid is not close enough to the
       library energy centroid for positive identification.
   P - Peakbackground subtraction
   } - Peak is too close to another for the activity
       to be found directly.

   Nuclide Codes:                      Peak Codes:
   T - Thermal Neutron Activation      G - Gamma Ray
   F - Fast Neutron Activation         X - X-Ray
```

I - Fission Product
N - Naturally Occurring Isotope
P - Photon Reaction
C - Charged Particle Reaction
M - No MDA Calculation
R - Coincidence Corrected
H - Halflife limit exceeded

P - Positron Decay
S - Single-Escape
D - Double-Escape
K - Key Line
A - Not in Average
C - Coincidence Peak

- -

***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	-3.5498E+00	-3.5540E+00	2.4212E+01	2.4213E+01	2.775E+01
K-40		9.6878E+02	9.6878E+02	1.2385E+02	1.3541E+02	
MN-54	#A	-4.5646E-01	-4.5655E-01	3.7793E+00	3.7794E+00	3.656E+00
CO-57	#B	5.0023E-03	5.0035E-03	2.6581E+00	2.6581E+00	2.994E+00
CO-60	#B	-6.5140E-02	-6.5142E-02	4.1937E+00	4.1937E+00	3.433E+00
Sr-85	#A	-1.0705E+00	-1.0716E+00	3.3070E+00	3.3076E+00	3.701E+00
Kr-85	#A	-2.6533E+04	-2.6533E+04	8.7476E+04	8.7489E+04	8.582E+04
Y-88	#B	-3.4602E-01	-3.4622E-01	2.4318E+00	2.4319E+00	3.088E+00
NB-94	#B	-6.4496E-01	-6.4496E-01	3.0159E+00	3.0161E+00	3.347E+00
Ag-108M	#B	1.2010E-01	1.2010E-01	3.3695E+00	3.3695E+00	3.957E+00
CD-109	#A	9.7979E+00	9.7992E+00	8.4018E+01	8.4020E+01	9.374E+01
SN-113	#B	2.7405E-01	2.7419E-01	3.7372E+00	3.7372E+00	4.289E+00
SB-125	#B	7.6604E+00	7.6609E+00	6.9161E+00	6.9296E+00	9.119E+00
I-131	#B	-6.6047E-01	-6.6560E-01	2.8101E+00	2.8103E+00	3.152E+00
CS-134	#B	2.8959E-01	2.8961E-01	2.6515E+00	2.6516E+00	3.091E+00
CS-137	#A	1.5647E+00	1.5647E+00	2.8598E+00	2.8612E+00	3.146E+00
CE-139	#A	-4.1160E-01	-4.1179E-01	3.2563E+00	3.2564E+00	3.466E+00
EU-152	#B	-6.3468E-02	-6.3469E-02	1.3966E+01	1.3966E+01	1.001E+01
EU-154	#B	-1.3022E+00	-1.3023E+00	7.2779E+00	7.2783E+00	7.473E+00
EU-155	#B	8.1409E+00	8.1412E+00	1.0607E+01	1.0617E+01	1.156E+01
HG-203	#B	1.8225E+00	1.8249E+00	2.5993E+00	2.6013E+00	2.812E+00
TL-208		1.9919E+01	1.9919E+01	6.2179E+00	6.3190E+00	
PB-212	#	4.6425E+01	4.6425E+01	8.4353E+00	8.8337E+00	6.905E+00
PB-214	#	3.0990E+01	3.0990E+01	8.2622E+00	8.4458E+00	6.826E+00
BI-212		5.3862E+01	5.3862E+01	3.4719E+01	3.4852E+01	
BI-214		3.4562E+01	3.4562E+01	1.1204E+01	1.1373E+01	
RA-224	A	8.3743E+01	8.3743E+01	8.2670E+01	8.2806E+01	
RA-226	#	1.0648E+02	1.0648E+02	7.4142E+01	7.4385E+01	7.761E+01
AC-228		5.1970E+01	5.1970E+01	1.0989E+01	1.1374E+01	
TH-227	#B	-4.1855E+00	-4.1855E+00	2.8443E+01	2.8444E+01	3.001E+01
PA-234	#B	4.8396E+00	4.8396E+00	3.8746E+00	3.8839E+00	1.145E+01
TH-234	#B	9.2186E+01	9.2186E+01	7.6481E+01	7.6652E+01	1.501E+02
AM-241	#A	-6.1214E+00	-6.1215E+00	2.1019E+01	2.1021E+01	2.224E+01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (1120.2 to 1999.1 keV) 1.2128405E+03 pCi/gm
Total Decayed Activity (1120.2 to 1999.1 keV) 1.2128405E+03 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JPK

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 101F_13SEPT2006_1429.An1

Sample description
FSS-OOL-05-08-005-F

Spectrum Filename: C:\GammaVision\Spectra\101F_13SEPT2006_1429.An1

Acquisition information
Start time: 13-Sep-2006 14:29:48
Live time: 2000
Real time: 2002
Dead time: 0.09 %
Detector ID: 1

Detector system
Det 101- DSPE-633

Calibration
Filename: D1_1LSa.Clb
Detector 101 1.0 Liter Marinelli Sand

Energy Calibration
Created: 03-Sep-2004 08:50:48
Zero offset: 0.244 keV
Gain: 0.500 keV/channel
Quadratic: -2.493E-08 keV/channel^2

Efficiency Calibration
Created: 03-Sep-2004 08:52:26
Type: Polynomial
Uncertainty: 0.626 %
Coefficients: -0.321775 -5.816463 0.734234
-0.099357 0.006049 -0.000149

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.23keV)
Stop channel: 4000 (1999.11keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 1.9080E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.9080E+03) =
5.2411E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	11-Sep-2006 11:38:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	101_150K_28APR05.Pbc 01-May-2005 05:24:47
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 10 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.0374

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
74.81	115.	29.92	1.50	1.654E-02				
74.81	115.	29.92	1.50	1.654E-02	74.81	9.600	PBC<MDA	PB212
76.98	199.	17.51	1.50	1.720E-02	77.11	10.700	7.673E-01	PB214
					77.11	17.500	4.692E-01	PB212
76.98	203.	17.51	1.50	1.720E-02	77.11	10.700	7.673E-01	PB214
					77.11	17.500	4.779E-01	PB212
238.81	378.	6.40	1.12	1.557E-02	238.63	43.100	3.929E-01	PB212
242.40	71.	22.73	1.12	1.538E-02				
249.58	39.	34.31	1.09	1.500E-02				
295.32	124.	12.63	1.16	1.292E-02	295.22	19.200	3.483E-01	PB214
300.13	39.	32.36	1.16	1.273E-02				
338.61	98.	16.98	1.34	1.134E-02	338.40	12.010	4.968E-01	AC228
351.92	255.	9.15	1.21	1.093E-02				
351.92	255.	9.15	1.21	1.093E-02	351.99	37.100	4.418E-01	PB214
409.81	24.	39.35	0.89	9.413E-03				
510.90	98.	17.91	1.64	7.588E-03	510.72	22.500	3.399E-01	TL208
583.33	126.	11.39	1.33	6.682E-03	583.14	86.000	1.517E-01	TL208
609.35	121.	12.85	1.00	6.412E-03	609.32	46.090	2.863E-01	BI214
661.17	48.	31.95	0.79	5.941E-03	661.62	84.620	6.643E-02	CS137
911.00	76.	15.06	1.83	4.447E-03				
911.00	76.	15.06	1.83	4.447E-03	911.07	29.000	4.083E-01	AC228
964.93	19.	34.73	1.61	4.227E-03	964.00	14.580	PBC<MDA	EU152
968.79	48.	19.54	1.62	4.212E-03				
968.79	48.	19.54	1.62	4.212E-03	968.90	17.460	4.554E-01	AC228
1119.65	29.	27.28	2.11	3.711E-03	1120.28	15.040	3.632E-01	BI214
1460.59	475.	4.65	1.95	2.943E-03	1460.75	10.700	1.063E+01	K40
1764.49	24.	20.41	1.33	2.481E-03	1764.51	15.920	4.224E-01	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide
484.50	242.37	96.	71.	0.036	68.18	1.124	XE-138 lD

Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM	Suspected	
498.87	249.58	70.	39.	0.020	102.92	1.088	XE-135	
599.85	300.05	87.	38.	0.019	116.95	1.446	PB-212	s
819.47	409.81	33.	24.	0.012	118.05	0.894	AC-228	
1021.74	510.90	100.	58.	0.029	82.93	1.640	TL-208	s
1930.27	965.02	12.	19.	0.009	104.20	1.613	AC-228	D
1938.00	968.88	20.	48.	0.024	58.62	1.616	AC-228	D

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-212	149.18	74.81	596.	115.	0.058	89.76	1.499
PB-214	153.79	77.11	534.	199.	0.100	52.52	1.499D
PB-212	153.79	77.11	531.	203.	0.102	52.52	1.499D
PB-212	477.17	238.73	312.	326.	0.163	27.74	1.499
PB-214	590.35	295.30	149.	119.	0.059	50.79	1.499
AC-228	676.69	338.45	77.	91.	0.046	50.03	1.499
PB-214	703.87	352.04	86.	205.	0.103	28.03	1.499s
TL-208	1166.67	583.33	32.	117.	0.058	33.65	1.499s
BI-214	1218.73	609.35	39.	119.	0.060	38.56	1.000
CS-137	1322.43	661.17	53.	47.	0.024	95.85	0.793s
AC-228	1822.88	911.26	22.	65.	0.032	46.68	1.578
AC-228	1938.23	968.91	40.	39.	0.020	81.72	1.616s
BI-214	2239.90	1119.65	14.	29.	0.014	81.85	2.109s
K-40	2922.20	1460.59	5.	473.	0.236	13.94	1.951
BI-214	3530.42	1764.49	0.	24.	0.012	61.24	1.332s

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

Nuclide Name	Nuclide Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	Peak MDA Value pCi/gm	COMMENTS
BE-7		9.3995E-02					
			477.56	9.400E-02	&(	3.092E-01 9.13E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
K-40	1.0634E+01						
		1460.75	1.063E+01	(P	3.018E-01	4.96E-01	G
MN-54	2.3191E-02						
		834.81	2.319E-02	%(P	3.496E-02	1.10E-02	G
CO-57	-1.0268E-02						
		122.07	-1.027E-02	%(	4.274E-02	1.28E-02	G K
		136.43	-1.184E-03	%	3.163E-01	9.34E-02	G
CO-60	-5.8511E-03						
		1332.51	-5.851E-03	%(P	4.956E-02	1.36E-02	G K
		1173.23	5.019E-03	% P	5.471E-02	1.53E-02	G K
Sr-85	-2.8776E-03						
		514.00	-2.878E-03	%(	4.821E-02	1.39E-02	G
Kr-85	-9.0894E+01						
		513.99	-9.089E+01	%(P	1.094E+03	3.15E+02	G
Y-88	-4.1488E-03						
		1836.01	-4.149E-03	%(	4.308E-02	1.12E-02	G K
		898.02	-1.586E-03	& P	4.763E-02	1.31E-02	G
NB-94	-1.2164E-04						
		871.10	-1.216E-04	&(P	3.895E-02	1.05E-02	G K
		702.50	3.888E-03	& P	4.287E-02	1.22E-02	G K
Ag-108M	-6.7423E-03						
		722.95	-6.742E-03	%(	4.856E-02	1.39E-02	G K
		614.37	4.640E-03	% P	3.373E-02	9.52E-03	G
		433.93	-1.281E-02	%	3.836E-02	1.14E-02	G
CD-109	5.5036E-01						
		88.04	5.504E-01	%(P	1.085E+00	3.29E-01	G
SN-113	-8.0235E-03						
		391.71	-8.024E-03	%(	5.513E-02	1.61E-02	G K
		255.04	3.648E-01	% P	1.447E+00	4.30E-01	G
SB-125	-2.0005E-02						
		427.95	-2.001E-02	%(P	1.091E-01	3.17E-02	G K
		600.77	2.957E-02	& P	1.989E-01	5.70E-02	G
		636.15	2.254E-02	% P	2.797E-01	7.77E-02	G
		463.51	1.594E-01	% P	2.965E-01	9.02E-02	G
		176.29	1.128E-01	% P	5.185E-01	1.54E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
I-131	-2.2500E-03						
		364.48	-2.250E-03	%(	4.331E-02	1.24E-02	G K
		636.97	-7.307E-02	%	4.839E-01	1.36E-01	G
		284.29	5.603E-04	%	5.068E-01	1.45E-01	G
CS-134	-1.0860E-02						
		604.66	-1.086E-02	%(P	4.377E-02	1.28E-02	G K
		795.76	-6.918E-04	% P	5.984E-02	1.67E-02	G
		569.29	-7.129E-02	& P	2.345E-01	6.88E-02	G
		801.84	8.201E-02	%	3.444E-01	9.82E-02	G
CS-137	6.6427E-02						
		661.62	6.643E-02	(P	5.160E-02	2.16E-02	G
CE-139	-3.6861E-03						
		165.85	-3.686E-03	&(P	3.813E-02	1.13E-02	G
EU-152	-3.3744E-02						
		121.78	-3.374E-02	%(P	1.231E-01	3.69E-02	G K
		344.30	6.083E-03	% P	1.065E-01	3.06E-02	G
		1408.08	4.313E-02	% P	1.842E-01	5.15E-02	G
		964.00	-4.058E-03	% P	4.543E-01	1.28E-01	G
		1112.07	-1.515E-03	% P	3.224E-01	8.61E-02	G
		778.90	-9.519E-03	% P	2.522E-01	6.83E-02	G
EU-154	-2.3020E-02						
		123.10	-2.302E-02	%(P	8.521E-02	2.55E-02	G K
		1274.80	4.997E-03	& P	1.489E-01	4.06E-02	G
		723.30	-3.576E-02	% P	2.297E-01	6.58E-02	G
		1004.80	-1.028E-03	% P	2.511E-01	6.80E-02	G
EU-155	3.0580E-02						
		86.45	3.058E-02	&(	1.146E-01	3.44E-02	G K
		105.31	7.466E-02	%	1.656E-01	5.01E-02	G
HG-203	-5.2168E-03						
		279.17	-5.217E-03	&(	4.129E-02	1.21E-02	G K
		72.87	-1.209E-02	% P	1.151E+00	3.43E-01	G
		70.83	8.344E-01	&	1.416E+00	4.32E-01	G
		82.50	-2.482E-01	%	1.989E+00	5.93E-01	G
TL-208	1.4369E-01						
		583.14	1.437E-01	@(P	3.580E-02	1.64E-02	G
		510.72	1.114E-01	% P	1.973E-01	5.81E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
PB-212	3.4390E-01						
		238.63	3.439E-01	(P	8.967E-02	3.24E-02	G K
							Energy duplication
		77.11	4.779E-01	+	2.589E-01	8.37E-02	G
		74.81	5.147E-01	& P	5.197E-01	1.61E-01	G
PB-214	3.5185E-01						
		351.99	3.588E-01	@(P	8.022E-02	3.38E-02	G K
		295.22	3.384E-01	(P	1.702E-01	5.82E-02	G
							Energy duplication
		77.11	7.673E-01	+ P	4.249E-01	1.37E-01	G
		241.92	-1.453E-02	% P	6.163E-01	1.82E-01	G
BI-212	9.3340E-02						
		727.17	9.334E-02	%(P	3.610E-01	1.05E-01	G K
		1620.56	4.569E-02	%	1.314E+00	3.26E-01	G
		785.42	3.503E-01	% P	1.977E+00	5.64E-01	G
BI-214	3.0524E-01						
		609.32	2.863E-01	(P	7.579E-02	3.71E-02	G K
		1764.51	4.224E-01	+ P	1.321E-01	8.78E-02	G
		1120.28	3.632E-01	(P	2.587E-01	1.00E-01	G
RA-224	4.1646E-02						
		241.00	4.165E-02	&(P	8.988E-01	2.64E-01	G
RA-226	7.5681E-01						
		185.99	7.568E-01	%(	1.046E+00	3.22E-01	G
AC-228	3.8609E-01						
		911.07	3.547E-01	(P	1.352E-01	5.68E-02	G K
		968.90	3.778E-01	@(P	3.097E-01	1.05E-01	G
		338.40	4.740E-01	(P	2.263E-01	8.09E-02	G
TH-227	-7.5432E-02						
		236.00	-7.543E-02	%(P	3.713E-01	1.11E-01	G K
		256.25	1.370E-01	% P	4.330E-01	1.29E-01	G
PA-234	-4.0870E-02						
		98.44	-4.087E-02	%(	1.397E-01	4.19E-02	G K
		946.00	2.052E-02	%	2.136E-01	5.95E-02	G
		131.28	-6.519E-02	%	1.774E-01	5.35E-02	G
		94.67	-3.283E-02	&	2.486E-01	7.41E-02	G
		883.24	7.139E-02	%	3.023E-01	8.66E-02	G
		926.70	-2.373E-02	%	4.003E-01	1.11E-01	G
		569.26	-2.490E-02	&	3.669E-01	1.04E-01	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments

TH-234       4.7094E-01
                           63.29 4.709E-01 %(P 1.743E+00 5.21E-01 G K
                           92.80 8.604E-01 % P 1.283E+00 3.92E-01 G
                           92.38-2.837E-01 % P 1.585E+00 4.67E-01 G

AM-241      -4.1129E-02
                           59.54-4.113E-02 %(P 2.246E-01 6.69E-02 G
   ( - This peak used in the nuclide activity average.

   * - Peak is too wide, but only one peak in library.
   ! - Peak is part of a multiplet and this area went
       negative during deconvolution.
   ? - Peak is too narrow.
   @ - Peak is too wide at FW25M, but ok at FWHM.
   % - Peak fails sensitivity test.
   $ - Peak identified, but first peak of this nuclide
       failed one or more qualification tests.
   + - Peak activity higher than counting uncertainty range.
   - - Peak activity lower than counting uncertainty range.
   = - Peak outside analysis energy range.
   & - Calculated peak centroid is not close enough to the
       library energy centroid for positive identification.
   P - Peakbackground subtraction
   } - Peak is too close to another for the activity
       to be found directly.

   Nuclide Codes:                      Peak Codes:
   T - Thermal Neutron Activation      G - Gamma Ray
   F - Fast Neutron Activation         X - X-Ray
   I - Fission Product                 P - Positron Decay
   N - Naturally Occurring Isotope     S - Single-Escape
   P - Photon Reaction                 D - Double-Escape
   C - Charged Particle Reaction       K - Key Line
   M - No MDA Calculation              A - Not in Average
   R - Coincidence Corrected           C - Coincidence Peak
   H - Halflife limit exceeded

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
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***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	9.1445E-02	9.3995E-02	2.7381E-01	2.7386E-01	3.008E-01
K-40		1.0634E+01	1.0634E+01	1.4893E+00	1.6059E+00	
MN-54	#A	2.3082E-02	2.3191E-02	3.3086E-02	3.3112E-02	3.480E-02
CO-57	#B	-1.0212E-02	-1.0268E-02	3.8415E-02	3.8419E-02	4.250E-02
CO-60	#B	-5.8466E-03	-5.8511E-03	4.3732E-02	4.3733E-02	4.952E-02
Sr-85	#A	-2.8131E-03	-2.8776E-03	4.1805E-02	4.1805E-02	4.713E-02

Kr-85	#A	-9.0893E+01	-9.0894E+01	1.6869E+03	1.6869E+03	1.094E+03
Y-88	#B	-4.0920E-03	-4.1488E-03	3.3492E-02	3.3493E-02	4.249E-02
NB-94	#B	-1.2164E-04	-1.2164E-04	1.2486E-01	1.2486E-01	3.895E-02
Ag-108M	#B	-6.7421E-03	-6.7423E-03	4.1738E-02	4.1740E-02	4.856E-02
CD-109	#A	5.4858E-01	5.5036E-01	9.8836E-01	9.8883E-01	1.082E+00
SN-113	#B	-7.9218E-03	-8.0235E-03	4.8247E-02	4.8249E-02	5.443E-02
SB-125	#B	-1.9976E-02	-2.0005E-02	1.0361E-01	1.0362E-01	1.090E-01
I-131	#B	-1.8743E-03	-2.2500E-03	3.7253E-02	3.7254E-02	3.608E-02
CS-134	#B	-1.0839E-02	-1.0860E-02	4.3494E-02	4.3498E-02	4.369E-02
CS-137	#	6.6418E-02	6.6427E-02	6.4866E-02	6.4974E-02	
CE-139	#A	-3.6469E-03	-3.6861E-03	3.6627E-02	3.6628E-02	3.772E-02
EU-152	#B	-3.3733E-02	-3.3744E-02	1.1679E-01	1.1681E-01	1.231E-01
EU-154	#B	-2.3009E-02	-2.3020E-02	8.1752E-02	8.1762E-02	8.517E-02
EU-155	#B	3.0555E-02	3.0580E-02	1.0305E-01	1.0306E-01	1.145E-01
HG-203	#B	-5.0549E-03	-5.2168E-03	3.6390E-02	3.6391E-02	4.000E-02
TL-208	#	1.4369E-01	1.4369E-01	4.9341E-02	5.0004E-02	3.580E-02
PB-212	#	3.4390E-01	3.4390E-01	9.7212E-02	9.9135E-02	8.967E-02
PB-214	#	3.5185E-01	3.5185E-01	9.9579E-02	1.0154E-01	8.022E-02
BI-212	#B	9.3340E-02	9.3340E-02	3.1525E-01	3.1530E-01	3.610E-01
BI-214		3.0524E-01	3.0524E-01	1.1879E-01	1.2004E-01	
RA-224	#A	4.1646E-02	4.1646E-02	7.9156E-01	7.9156E-01	8.988E-01
RA-226	#A	7.5681E-01	7.5681E-01	9.6571E-01	9.6666E-01	1.046E+00
AC-228	#	3.8609E-01	3.8609E-01	1.4013E-01	1.4182E-01	1.352E-01
TH-227	#B	-7.5432E-02	-7.5432E-02	3.4774E-01	3.4777E-01	3.713E-01
PA-234	#B	-4.0870E-02	-4.0870E-02	1.2580E-01	1.2583E-01	1.397E-01
TH-234	#B	4.7094E-01	4.7094E-01	1.5625E+00	1.5627E+00	1.743E+00
AM-241	#A	-4.1129E-02	-4.1129E-02	2.2151E-01	2.2152E-01	2.246E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (1120.2 to 1999.1 keV) 1.1005725E+01 pCi/gm
Total Decayed Activity (1120.2 to 1999.1 keV) 1.1005733E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JPK

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 101F_13SEPT2006_1507.An1

Sample description
FSS-OOL-05-08-004-F

Spectrum Filename: C:\GammaVision\Spectra\101F_13SEPT2006_1507.An1

Acquisition information
Start time: 13-Sep-2006 15:08:02
Live time: 2000
Real time: 2002
Dead time: 0.09 %
Detector ID: 1

Detector system
Det 101- DSPE-633

Calibration
Filename: D1_1LSa.Clb
Detector 101 1.0 Liter Marinelli Sand

Energy Calibration
Created: 03-Sep-2004 08:50:48
Zero offset: 0.244 keV
Gain: 0.500 keV/channel
Quadratic: -2.493E-08 keV/channel^2

Efficiency Calibration
Created: 03-Sep-2004 08:52:26
Type: Polynomial
Uncertainty: 0.626 %
Coefficients: -0.321775 -5.816463 0.734234
-0.099357 0.006049 -0.000149

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.23keV)
Stop channel: 4000 (1999.11keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 1.6880E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.6880E+03) =
5.9242E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	11-Sep-2006 11:45:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	101_150K_28APR05.Pbc 01-May-2005 05:24:47
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 13 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.0370

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
74.62	112.	22.67	1.00	1.651E-02	72.87	6.400	PBC<MDA	HG203
					74.81	9.600	PBC<MDA	PB212
77.19	263.	10.03	1.01	1.725E-02	77.11	10.700	1.130E+00	PB214
					77.11	17.500	7.006E-01	PB212
92.99	76.	40.54	1.50	1.985E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
					94.67	15.500	PBC<MDA	PA234
					98.44	25.100	PBC<MDA	PA234
93.00	84.	38.10	1.50	1.989E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
					94.67	15.500	PBC<MDA	PA234
					98.44	25.100	PBC<MDA	PA234
186.14	112.	27.57	1.13	1.857E-02	185.99	3.280	1.470E+00	RA226
209.60	93.	24.53	1.29	1.720E-02				
238.76	504.	5.17	1.12	1.557E-02	238.63	43.100	5.941E-01	PB212
241.58	97.	19.53	1.12	1.542E-02	241.00	3.900	1.279E+00	RA224
270.13	69.	23.45	1.65	1.401E-02				
295.17	125.	15.18	1.09	1.292E-02				
295.17	125.	15.18	1.09	1.292E-02	295.22	19.200	3.977E-01	PB214
300.54	48.	37.29	0.95	1.271E-02				
338.66	104.	18.32	1.15	1.134E-02	338.40	12.010	5.968E-01	AC228
352.05	158.	10.84	1.35	1.092E-02	351.99	37.100	3.078E-01	PB214
462.96	58.	30.78	0.79	8.351E-03				
462.96	58.	30.78	0.79	8.351E-03	463.51	10.000	5.484E-01	SB125
511.08	65.	21.24	1.63	7.590E-03	510.72	22.500	3.027E-01	TL208
583.21	150.	10.95	1.64	6.684E-03	583.14	86.000	2.053E-01	TL208
609.15	140.	13.70	1.47	6.414E-03	609.32	46.090	3.767E-01	BI214

911.35	93.	13.77	1.51	4.445E-03	911.07	29.000	5.645E-01	AC228
968.51	74.	17.29	2.17	4.212E-03	968.90	17.460	8.021E-01	AC228
1120.59	33.	33.19	1.40	3.710E-03	1120.28	15.040	4.621E-01	BI214
1460.72	397.	5.02	1.90	2.943E-03	1460.75	10.700	1.004E+01	K40

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
1764.61	24.	20.41	1.25	2.481E-03	1764.51	15.920	4.775E-01	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
148.81	74.72	269.	112.	0.056	68.01	1.005	BI-207	D
153.94	77.28	218.	263.	0.132	30.10	1.007	PB-214	D
418.88	209.60	176.	93.	0.046	73.59	1.291	NP-239	s
477.21	238.71	87.	504.	0.252	15.50	1.122	PB-212	D
482.87	241.54	131.	97.	0.049	58.59	1.124	PB-214	D
539.98	270.13	86.	69.	0.034	70.34	1.653	AC-228	s
600.82	300.54	107.	47.	0.024	101.94	0.951	PB-212	s
2241.77	1120.59	26.	33.	0.016	99.57	1.399	SC-46	l

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-214	153.79	77.11	558.	230.	0.115	47.10	1.499D
PB-212	153.79	77.11	554.	233.	0.117	47.10	1.499D
TH-234	185.58	93.00	557.	84.	0.042	114.29	1.499
RA-226	371.71	186.03	315.	90.	0.045	89.38	1.499s
PB-212	477.11	238.70	255.	361.	0.181	24.02	1.499
RA-224	483.13	241.71	302.	81.	0.040	96.12	1.499
PB-214	590.21	295.23	126.	106.	0.053	52.56	1.499s
AC-228	677.10	338.66	101.	102.	0.051	54.97	1.152s
PB-214	703.84	352.02	76.	163.	0.081	32.24	1.499
SB-125	926.05	463.08	65.	32.	0.016	112.23	1.499s
TL-208	1022.11	511.08	80.	65.	0.032	63.72	1.634s
TL-208	1166.42	583.21	47.	147.	0.074	32.85	1.643s
BI-214	1218.33	609.15	57.	139.	0.070	41.10	1.470s
AC-228	1823.05	911.35	27.	91.	0.045	41.32	1.515s
AC-228	1937.42	968.51	28.	74.	0.037	51.87	2.165s
K-40	2922.46	1460.72	2.	395.	0.197	15.06	1.904
BI-214	3530.65	1764.61	0.	24.	0.012	61.24	1.249s

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	MDA Value pCi/gm	COMMENTS
BE-7		4.5991E-02					
			477.56	4.599E-02	&(	3.701E-01 1.06E-01	G
K-40		1.0037E+01					
			1460.75	1.004E+01	(P	2.478E-01 5.07E-01	G
MN-54		-6.9949E-04					
			834.81	-6.995E-04	%(P	5.278E-02 1.46E-02	G
CO-57		3.9167E-03					
			122.07	3.917E-03	%(	3.873E-02 1.15E-02	G K
			136.43	-9.214E-02	%	3.753E-01 1.12E-01	G
CO-60		-2.1770E-04					
			1332.51	-2.177E-04	&(P	9.042E-02 2.54E-02	G K
			1173.23	2.572E-02	% P	5.490E-02 1.66E-02	G K
Sr-85		-8.4944E-03					
			514.00	-8.494E-03	&(	5.300E-02 1.55E-02	G
Kr-85		-3.9922E+01					
			513.99	-3.992E+01	&(P	1.206E+03 3.44E+02	G
Y-88		4.8857E-03					
			1836.01	4.886E-03	%(	4.280E-02 1.10E-02	G K
			898.02	6.623E-03	& P	5.361E-02 1.51E-02	G
NB-94		5.2915E-03					
			871.10	5.292E-03	&(P	3.629E-02 1.00E-02	G K
			702.50	1.699E-02	% P	2.930E-02 9.15E-03	G K
Ag-108M		-1.1763E-02					
			722.95	-1.176E-02	%(	6.003E-02 1.74E-02	G K
			614.37	-8.404E-03	% P	4.580E-02 1.32E-02	G
			433.93	3.618E-03	%	4.284E-02 1.23E-02	G
CD-109		2.9881E-02					
			88.04	2.988E-02	%(P	1.415E+00 4.21E-01	G
SN-113		-5.4935E-03					
			391.71	-5.493E-03	%(	5.348E-02 1.54E-02	G K
			255.04	-3.143E-01	% P	1.840E+00 5.44E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	1.0228E-01						
		427.95	3.175E-02	%(P	1.180E-01	3.47E-02	G K
		600.77	-6.126E-02	% P	2.376E-01	6.94E-02	G
		636.15	-3.699E-02	% P	3.598E-01	1.01E-01	G
		463.51	3.110E-01	*(P	3.858E-01	1.22E-01	G
		176.29	-1.472E-02	& P	5.955E-01	1.75E-01	G
I-131	1.0119E-02						
		364.48	1.012E-02	&(	4.495E-02	1.32E-02	G K
		636.97	-4.892E-02	%	6.281E-01	1.76E-01	G
		284.29	1.137E-01	&	6.248E-01	1.84E-01	G
CS-134	-1.7883E-02						
		604.66	-1.788E-02	%(P	5.506E-02	1.63E-02	G K
		795.76	1.637E-02	% P	6.048E-02	1.77E-02	G
		569.29	8.220E-02	& P	2.199E-01	6.52E-02	G
		801.84	0.000E+00	%	6.408E-01	1.79E-01	G
CS-137	1.4462E-02						
		661.62	1.446E-02	%(P	5.815E-02	1.70E-02	G
CE-139	5.4567E-03						
		165.85	5.457E-03	%(P	4.664E-02	1.38E-02	G
EU-152	-2.3377E-02						
		121.78	-2.338E-02	%(P	1.336E-01	3.98E-02	G K
		344.30	3.598E-03	% P	1.182E-01	3.38E-02	G
		1408.08	-2.208E-03	& P	2.040E-01	5.12E-02	G
		964.00	-7.310E-04	% P	3.930E-01	1.08E-01	G
		1112.07	-3.613E-02	% P	4.918E-01	1.38E-01	G
		778.90	2.582E-03	& P	3.407E-01	9.36E-02	G
EU-154	-2.4699E-02						
		123.10	-2.470E-02	%(P	9.778E-02	2.93E-02	G K
		1274.80	-3.007E-03	% P	1.836E-01	5.03E-02	G
		723.30	-5.770E-02	% P	2.832E-01	8.21E-02	G
		1004.80	-1.059E-03	% P	3.291E-01	9.06E-02	G
EU-155	9.8537E-03						
		86.45	9.854E-03	%(	1.505E-01	4.48E-02	G K
		105.31	2.896E-02	%	1.808E-01	5.39E-02	G
HG-203	-7.1851E-04						
		279.17	-7.185E-04	&(	4.634E-02	1.35E-02	G K
		72.87	1.904E-01	& P	1.026E+00	3.07E-01	G
		70.83	5.753E-01	%	1.391E+00	4.20E-01	G
		82.50	1.524E-01	&	2.329E+00	6.93E-01	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments

TL-208       2.0531E-01
                          583.14 2.053E-01  (P 4.806E-02 2.28E-02 G
                          510.72 3.027E-01 + P 2.086E-01 8.03E-02 G

PB-212       4.3087E-01
                          238.63 4.309E-01  (P 9.198E-02 3.51E-02 G K
                                                          Energy duplication
                           77.11 6.204E-01 +   2.989E-01 9.74E-02 G
                           74.81 4.213E-01 & P 6.257E-01 1.91E-01 G

PB-214       3.2845E-01
                          351.99 3.213E-01  (P 8.568E-02 3.49E-02 G K
                          295.22 3.423E-01 *(P 1.778E-01 6.10E-02 G
                                                          Energy duplication
                           77.11 9.985E-01 + P 4.905E-01 1.59E-01 G
                          241.92-6.668E-02 % P 5.515E-01 1.63E-01 G

BI-212       2.3846E-01
                          727.17 2.385E-01 %(P 3.937E-01 1.22E-01 G K
                         1620.56 2.025E-03 %   1.748E+00 4.41E-01 G
                          785.42 6.790E-01 % P 2.195E+00 6.43E-01 G

BI-214       4.0262E-01
                          609.32 3.767E-01 @(P 1.026E-01 5.20E-02 G K
                         1764.51 4.775E-01  (P 1.494E-01 9.93E-02 G
                         1120.28 1.574E-01 % P 3.633E-01 1.09E-01 G

RA-224       1.0751E+00
                          241.00 1.075E+00  (P 1.112E+00 3.47E-01 G

RA-226       1.1822E+00
                          185.99 1.182E+00 @(  1.121E+00 3.52E-01 G

AC-228       6.4210E-01
                          911.07 5.645E-01 @(P 1.673E-01 7.94E-02 G K
                          968.90 8.021E-01 @(P 2.994E-01 1.40E-01 G
                          338.40 5.968E-01 @(P 2.915E-01 1.12E-01 G

TH-227      -8.0653E-02
                          236.00-8.065E-02 %(P 3.768E-01 1.12E-01 G K
                          256.25 1.330E-01 & P 5.192E-01 1.54E-01 G

PA-234       4.5412E-02
                           98.44 4.541E-02 &(  1.211E-01 3.65E-02 G K
                          946.00 2.000E-02 &   2.233E-01 6.17E-02 G
                          131.28-2.381E-03 %   1.978E-01 5.85E-02 G
                           94.67 1.081E-02 %   2.831E-01 8.40E-02 G
                          883.24 4.606E-03 &   3.171E-01 8.46E-02 G
                          926.70 1.029E-01 &   4.244E-01 1.22E-01 G
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 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26 1.267E-01 &   3.235E-01 9.66E-02 G

TH-234       8.5869E-01
                           63.29 6.473E-01 %(P 1.975E+00 5.92E-01 G K
                           92.80 1.133E+00 &(P 1.512E+00 4.63E-01 G
                           92.38 1.189E+00 & P 1.809E+00 5.51E-01 G

AM-241      -8.0400E-02
                           59.54-8.040E-02 %(P 2.769E-01 8.30E-02 G
   ( - This peak used in the nuclide activity average.

   * - Peak is too wide, but only one peak in library.
   ! - Peak is part of a multiplet and this area went
       negative during deconvolution.
   ? - Peak is too narrow.
   @ - Peak is too wide at FW25M, but ok at FWHM.
   % - Peak fails sensitivity test.
   $ - Peak identified, but first peak of this nuclide
       failed one or more qualification tests.
   + - Peak activity higher than counting uncertainty range.
   - - Peak activity lower than counting uncertainty range.
   = - Peak outside analysis energy range.
   & - Calculated peak centroid is not close enough to the
       library energy centroid for positive identification.
   P - Peakbackground subtraction
   } - Peak is too close to another for the activity
       to be found directly.

   Nuclide Codes:                      Peak Codes:
   T - Thermal Neutron Activation      G - Gamma Ray
   F - Fast Neutron Activation         X - X-Ray
   I - Fission Product                 P - Positron Decay
   N - Naturally Occurring Isotope     S - Single-Escape
   P - Photon Reaction                 D - Double-Escape
   C - Charged Particle Reaction       K - Key Line
   M - No MDA Calculation              A - Not in Average
   R - Coincidence Corrected           C - Coincidence Peak
   H - Halflife limit exceeded

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
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***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	4.4730E-02	4.5991E-02	3.1906E-01	3.1907E-01	3.599E-01
K-40		1.0037E+01	1.0037E+01	1.5199E+00	1.6223E+00	
MN-54	#A	-6.9617E-04	-6.9949E-04	3.6502E-02	3.6502E-02	5.253E-02
CO-57	#B	3.8952E-03	3.9167E-03	3.4396E-02	3.4397E-02	3.852E-02
CO-60	#B	-2.1753E-04	-2.1770E-04	1.3184E-02	1.3184E-02	9.035E-02

Sr-85	#A	-8.3022E-03	-8.4944E-03	4.6466E-02	4.6469E-02	5.180E-02
Kr-85	#A	-3.9922E+01	-3.9922E+01	6.5360E+03	6.5360E+03	1.206E+03
Y-88	#B	4.8182E-03	4.8857E-03	3.2909E-02	3.2910E-02	4.221E-02
NB-94	#B	5.2915E-03	5.2915E-03	3.0108E-02	3.0110E-02	3.629E-02
Ag-108M	#B	-1.1763E-02	-1.1763E-02	5.2323E-02	5.2328E-02	6.002E-02
CD-109	#A	2.9783E-02	2.9881E-02	1.2620E+00	1.2620E+00	1.410E+00
SN-113	#B	-5.4231E-03	-5.4935E-03	4.6213E-02	4.6214E-02	5.279E-02
SB-125	#B	1.0213E-01	1.0228E-01	1.1992E-01	1.2005E-01	1.178E-01
I-131	#B	8.4133E-03	1.0119E-02	3.9470E-02	3.9474E-02	3.737E-02
CS-134	#B	-1.7848E-02	-1.7883E-02	5.3336E-02	5.3345E-02	5.495E-02
CS-137	#A	1.4460E-02	1.4462E-02	5.0885E-02	5.0892E-02	5.814E-02
CE-139	#A	5.3981E-03	5.4567E-03	4.1495E-02	4.1496E-02	4.614E-02
EU-152	#B	-2.3369E-02	-2.3377E-02	1.3027E-01	1.3028E-01	1.335E-01
EU-154	#B	-2.4688E-02	-2.4699E-02	9.4071E-02	9.4081E-02	9.773E-02
EU-155	#B	9.8456E-03	9.8537E-03	1.3426E-01	1.3426E-01	1.504E-01
HG-203	#B	-6.9599E-04	-7.1851E-04	4.0407E-02	4.0407E-02	4.488E-02
TL-208		2.0531E-01	2.0531E-01	6.8539E-02	6.9514E-02	
PB-212	#	4.3087E-01	4.3087E-01	1.0524E-01	1.0802E-01	9.198E-02
PB-214	#	3.2845E-01	3.2845E-01	1.0283E-01	1.0449E-01	8.568E-02
BI-212	#B	2.3846E-01	2.3846E-01	3.6495E-01	3.6520E-01	3.937E-01
BI-214		4.0262E-01	4.0262E-01	1.5074E-01	1.5245E-01	
RA-224	#A	1.0751E+00	1.0751E+00	1.0425E+00	1.0443E+00	1.112E+00
RA-226	#	1.1822E+00	1.1822E+00	1.0566E+00	1.0587E+00	1.121E+00
AC-228	#	6.4210E-01	6.4210E-01	1.8750E-01	1.9098E-01	
TH-227	#B	-8.0653E-02	-8.0653E-02	3.5342E-01	3.5345E-01	3.768E-01
PA-234	#B	4.5412E-02	4.5412E-02	1.0937E-01	1.0940E-01	1.211E-01
TH-234	#B	8.5869E-01	8.5869E-01	1.0531E+00	1.0542E+00	1.975E+00
AM-241	#A	-8.0399E-02	-8.0400E-02	2.6377E-01	2.6380E-01	2.769E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (269.6 to 1999.1 keV) 1.1286710E+01 pCi/gm
Total Decayed Activity (269.6 to 1999.1 keV) 1.1286710E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JJM

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 101F_13SEPT2006_1546.An1

Sample description
FSS-OOL-05-08-004-F-RC

Spectrum Filename: C:\GammaVision\Spectra\101F_13SEPT2006_1546.An1

Acquisition information

Start time:	13-Sep-2006 15:46:06
Live time:	2000
Real time:	2002
Dead time:	0.08 %
Detector ID:	1

Detector system
Det 101- DSPE-633

Calibration

Filename:	D1_1LSa.Clb

Detector 101 1.0 Liter Marinelli Sand

Energy Calibration

Created:	03-Sep-2004 08:50:48
Zero offset:	0.244 keV
Gain:	0.500 keV/channel
Quadratic:	-2.493E-08 keV/channel^2

Efficiency Calibration

Created:	03-Sep-2004 08:52:26
Type:	Polynomial
Uncertainty:	0.626 %
Coefficients:	-0.321775 -5.816463 0.734234
	-0.099357 0.006049 -0.000149

Library Files

Main analysis library:	FSS_Rev_1.Lib
Library Match Width:	1.000
Peak stripping:	Library based

Analysis parameters

Analysis engine:	Env32 G53W4.20
Start channel:	100 (50.23keV)
Stop channel:	4000 (1999.11keV)
Peak rejection level:	41.667%
Peak search sensitivity:	3
Sample Size:	1.6880E+03
Activity scaling factor:	1.0000E+06/(1.0000E+00* 1.6880E+03) = 5.9242E+02
Detection limit method:	Nureg 4.16
Random error:	1.0000000E+00
Systematic error:	1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	11-Sep-2006 11:45:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	101_150K_28APR05.Pbc 01-May-2005 05:24:47
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 11 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.2243

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
77.16	206.	17.45	1.50	1.720E-02	77.11	17.500	5.473E-01	PB212
					77.11	10.700	8.789E-01	PB214
77.16	202.	17.45	1.50	1.720E-02	77.11	17.500	5.374E-01	PB212
					77.11	10.700	8.789E-01	PB214
87.03	74.	31.50	1.01	1.916E-02	86.45	32.740	9.472E-02	EU155
90.34	59.	40.32	1.02	1.960E-02	88.04	3.790	PBC<MDA	CD109
92.91	98.	23.40	1.02	1.989E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
128.40	60.	41.60	1.15	2.111E-02				
185.81	102.	23.19	1.41	1.859E-02				
185.81	102.	23.19	1.41	1.859E-02	185.99	3.280	1.342E+00	RA226
209.53	83.	31.61	1.29	1.720E-02				
238.79	452.	5.66	1.12	1.557E-02	238.63	43.100	5.322E-01	PB212
242.09	71.	23.79	1.12	1.540E-02	241.00	3.900	PBC<MDA	RA224
					241.92	7.470	PBC<MDA	PB214
277.36	32.	40.22	1.25	1.368E-02				
295.39	97.	23.06	1.15	1.291E-02	295.22	19.200	3.073E-01	PB214
338.52	85.	20.89	0.99	1.135E-02	338.40	12.010	4.887E-01	AC228
352.17	178.	10.47	0.97	1.092E-02	351.99	37.100	3.479E-01	PB214
463.30	45.	31.21	0.82	8.345E-03				
463.30	45.	31.21	0.82	8.345E-03	463.51	10.000	4.176E-01	SB125
510.90	76.	20.65	1.88	7.588E-03	510.72	22.500	2.816E-01	TL208
583.19	162.	11.10	1.44	6.684E-03	583.14	86.000	2.230E-01	TL208
609.42	149.	10.80	1.16	6.412E-03	609.32	46.090	4.017E-01	BI214
910.88	84.	15.72	1.43	4.447E-03				
910.88	84.	15.72	1.43	4.447E-03	911.07	29.000	5.124E-01	AC228
967.00	74.	16.66	0.79	4.219E-03				

1119.26	35.	40.72	0.73	3.711E-03	1120.28	15.040	4.994E-01	BI214
1460.82	404.	5.19	1.98	2.942E-03	1460.75	10.700	1.022E+01	K40
1764.44	14.	36.45	2.11	2.481E-03	1764.51	15.920	PBC<MDA	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
173.64	86.90	234.	74.	0.037	94.50	1.014	TB-160	lD
180.27	90.21	256.	59.	0.030	120.96	1.016	PB-214	lD
185.41	92.77	234.	90.	0.045	78.78	1.018	TH-234	D
418.73	209.53	230.	83.	0.041	94.82	1.293	AC-228	s
477.27	238.70	102.	452.	0.226	16.99	1.122	PB-212	D
483.89	242.00	108.	71.	0.036	71.37	1.124	PB-214	D
554.44	277.36	64.	36.	0.018	107.84	1.248	TL-208	
1934.40	967.00	58.	40.	0.020	92.88	0.787	TB-160	s

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-212	153.79	77.11	542.	206.	0.103	52.35	1.499D
PB-214	153.79	77.11	546.	202.	0.101	52.35	1.499D
TH-234	185.68	93.05	546.	101.	0.051	96.06	1.499s
RA-226	371.76	186.05	301.	101.	0.050	78.91	1.499s
PB-212	477.20	238.75	257.	395.	0.198	22.46	1.499
PB-214	590.78	295.52	137.	88.	0.044	63.61	1.499
AC-228	676.73	338.47	83.	76.	0.038	59.22	1.499
PB-214	703.86	352.03	63.	148.	0.074	33.05	1.499
SB-125	926.11	463.11	58.	32.	0.016	107.03	1.499s
TL-208	1021.74	510.90	75.	60.	0.030	61.94	1.876s
TL-208	1166.40	583.19	55.	160.	0.080	33.29	1.437
BI-214	1218.88	609.42	41.	148.	0.074	32.40	1.159s
AC-228	1822.66	911.15	29.	60.	0.030	52.39	1.578
BI-214	2239.11	1119.26	45.	35.	0.017	122.16	0.731s
K-40	2922.66	1460.82	10.	402.	0.201	15.58	1.985
BI-214	3530.32	1764.44	6.	14.	0.007	109.34	2.106s

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	Peak MDA Value pCi/gm	COMMENTS
BE-7		-6.4603E-02					
			477.56	-6.460E-02	%(	3.828E-01 1.11E-01	G
K-40		1.0225E+01					
			1460.75	1.022E+01	(P	4.414E-01 5.34E-01	G
MN-54		3.5553E-03					
			834.81	3.555E-03	%(P	4.625E-02 1.28E-02	G
CO-57		-1.7984E-03					
			122.07	-1.798E-03	&(	4.447E-02 1.32E-02	G K
			136.43	-6.090E-02	%	3.592E-01 1.07E-01	G
CO-60		3.3956E-02					
			1332.51	3.396E-02	%(P	4.474E-02 1.47E-02	G K
			1173.23	2.735E-02	% P	5.975E-02 1.81E-02	G K
Sr-85		-1.6382E-02					
			514.00	-1.638E-02	%(	5.105E-02 1.52E-02	G
Kr-85		-3.9904E+02					
			513.99	-3.990E+02	%(P	1.159E+03 3.43E+02	G
Y-88		0.0000E+00					
			1836.01	0.000E+00	%(	5.664E-02 1.44E-02	G K
			898.02	5.003E-03	% P	3.696E-02 1.01E-02	G
NB-94		-1.0038E-02					
			871.10	-1.004E-02	%(P	4.889E-02 1.40E-02	G K
			702.50	6.838E-03	& P	4.242E-02 1.21E-02	G K
Ag-108M		-2.1464E-02					
			722.95	-2.146E-02	%(	5.794E-02 1.73E-02	G K
			614.37	-1.077E-02	& P	4.480E-02 1.30E-02	G
			433.93	1.037E-03	&	3.259E-02 9.12E-03	G
CD-109		1.9883E-01					
			88.04	1.988E-01	%(P	1.346E+00 4.02E-01	G
SN-113		2.3932E-04					
			391.71	2.393E-04	%(	5.792E-02 1.65E-02	G K
			255.04	1.809E-01	% P	1.761E+00 5.17E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	7.8012E-02						
		427.95	-9.952E-04	%(P	1.149E-01	3.23E-02	G K
		600.77	5.856E-02	& P	2.209E-01	6.46E-02	G
		636.15	-3.129E-02	% P	3.783E-01	1.06E-01	G
		463.51	3.119E-01	(P	3.660E-01	1.16E-01	G
		176.29	-5.516E-02	% P	5.610E-01	1.65E-01	G
I-131	-1.1663E-02						
		364.48	-1.166E-02	%(	5.495E-02	1.62E-02	G K
		636.97	-8.341E-02	&	7.358E-01	2.10E-01	G
		284.29	1.733E-01	&	5.745E-01	1.71E-01	G
CS-134	-2.7825E-02						
		604.66	-2.782E-02	%(P	5.975E-02	1.80E-02	G K
		795.76	8.809E-03	& P	5.878E-02	1.68E-02	G
		569.29	-1.117E-03	& P	2.427E-01	6.72E-02	G
		801.84	-1.678E-03	%	4.636E-01	1.26E-01	G
CS-137	1.5104E-02						
		661.62	1.510E-02	%(P	4.664E-02	1.37E-02	G
CE-139	-2.6522E-03						
		165.85	-2.652E-03	&(P	3.936E-02	1.16E-02	G
EU-152	-5.2962E-03						
		121.78	-5.296E-03	&(P	1.290E-01	3.81E-02	G K
		344.30	9.668E-03	& P	1.143E-01	3.28E-02	G
		1408.08	-2.208E-03	% P	2.610E-01	6.86E-02	G
		964.00	1.528E-01	% P	4.251E-01	1.26E-01	G
		1112.07	-1.221E-01	% P	5.420E-01	1.57E-01	G
		778.90	9.822E-02	% P	2.859E-01	8.41E-02	G
EU-154	1.1804E-02						
		123.10	1.180E-02	%(P	9.201E-02	2.73E-02	G K
		1274.80	-1.512E-04	& P	1.444E-01	3.82E-02	G
		723.30	-8.492E-02	& P	2.672E-01	7.87E-02	G
		1004.80	-2.520E-02	& P	3.121E-01	8.70E-02	G
EU-155	7.5560E-02						
		86.45	7.556E-02	%(	1.540E-01	4.67E-02	G K
		105.31	7.188E-02	%	1.736E-01	5.24E-02	G
HG-203	-1.1849E-02						
		279.17	-1.185E-02	%(	4.612E-02	1.37E-02	G K
		72.87	1.566E-02	% P	9.894E-01	2.93E-01	G
		70.83	-3.581E-02	%	1.906E+00	5.66E-01	G
		82.50	-5.671E-01	&	2.328E+00	6.98E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	2.3514E-01						
		583.14	2.230E-01	(P	5.185E-02	2.51E-02	G
		510.72	2.816E-01	*(P	2.018E-01	7.37E-02	G
PB-212	4.9322E-01						
		238.63	4.713E-01	(P	9.230E-02	3.58E-02	G K
							Energy duplication
		77.11	5.473E-01	(	2.957E-01	9.55E-02	G
		74.81	3.443E-01	& P	6.166E-01	1.87E-01	G
PB-214	2.8902E-01						
		351.99	2.922E-01	(P	7.867E-02	3.26E-02	G K
		295.22	2.828E-01	(P	1.846E-01	6.12E-02	G
							Energy duplication
		77.11	8.789E-01	+ P	4.852E-01	1.56E-01	G
		241.92	-5.051E-02	% P	7.089E-01	2.10E-01	G
BI-212	1.9933E-01						
		727.17	1.993E-01	%(P	3.278E-01	1.02E-01	G K
		1620.56	1.296E-01	&	1.771E+00	4.64E-01	G
		785.42	7.612E-01	% P	2.001E+00	5.94E-01	G
BI-214	4.2572E-01						
		609.32	4.017E-01	@(P	8.787E-02	4.37E-02	G K
		1764.51	2.739E-01	- P	2.937E-01	1.03E-01	G
		1120.28	4.994E-01	(P	4.882E-01	2.05E-01	G
RA-224	6.9225E-01						
		241.00	6.923E-01	%(P	1.141E+00	3.49E-01	G
RA-226	1.3248E+00						
		185.99	1.325E+00	*(	1.098E+00	3.48E-01	G
AC-228	3.9459E-01						
		911.07	3.727E-01	(P	1.735E-01	6.71E-02	G K
		968.90	2.238E-01	& P	3.517E-01	1.09E-01	G
		338.40	4.475E-01	(P	2.648E-01	9.09E-02	G
TH-227	-9.3395E-02						
		236.00	-9.340E-02	%(P	4.084E-01	1.22E-01	G K
		256.25	6.250E-02	% P	4.950E-01	1.45E-01	G
PA-234	-2.0690E-04						
		98.44	-2.069E-04	%(	1.604E-01	4.74E-02	G K
		946.00	7.802E-03	%	3.305E-01	9.30E-02	G
		131.28	-3.335E-02	%	1.911E-01	5.70E-02	G
		94.67	-8.575E-02	&	3.031E-01	9.11E-02	G
		883.24	1.617E-02	%	4.016E-01	1.11E-01	G
		926.70	5.010E-02	&	4.276E-01	1.20E-01	G

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 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26 2.469E-03 &   3.695E-01 1.03E-01 G

TH-234       1.1085E+00
                           63.29 9.141E-01 %(P 1.783E+00 5.39E-01 G K
                           92.80 1.361E+00  (P 1.498E+00 4.62E-01 G
                           92.38-1.871E-01 % P 1.892E+00 5.57E-01 G

AM-241      -4.7447E-02
                           59.54-4.745E-02 %(P 2.688E-01 8.01E-02 G
   ( - This peak used in the nuclide activity average.

   * - Peak is too wide, but only one peak in library.
   ! - Peak is part of a multiplet and this area went
       negative during deconvolution.
   ? - Peak is too narrow.
   @ - Peak is too wide at FW25M, but ok at FWHM.
   % - Peak fails sensitivity test.
   $ - Peak identified, but first peak of this nuclide
       failed one or more qualification tests.
   + - Peak activity higher than counting uncertainty range.
   - - Peak activity lower than counting uncertainty range.
   = - Peak outside analysis energy range.
   & - Calculated peak centroid is not close enough to the
       library energy centroid for positive identification.
   P - Peakbackground subtraction
   } - Peak is too close to another for the activity
       to be found directly.

   Nuclide Codes:                      Peak Codes:
   T - Thermal Neutron Activation      G - Gamma Ray
   F - Fast Neutron Activation         X - X-Ray
   I - Fission Product                 P - Positron Decay
   N - Naturally Occurring Isotope     S - Single-Escape
   P - Photon Reaction                 D - Double-Escape
   C - Charged Particle Reaction       K - Key Line
   M - No MDA Calculation              A - Not in Average
   R - Coincidence Corrected           C - Coincidence Peak
   H - Halflife limit exceeded

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
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***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	-6.2811E-02	-6.4603E-02	3.3289E-01	3.3291E-01	3.722E-01
K-40		1.0225E+01	1.0225E+01	1.6017E+00	1.7027E+00	
MN-54	#A	3.5382E-03	3.5553E-03	3.8536E-02	3.8536E-02	4.602E-02
CO-57	#B	-1.7884E-03	-1.7984E-03	3.9478E-02	3.9478E-02	4.422E-02
CO-60	#B	3.3929E-02	3.3956E-02	4.4223E-02	4.4265E-02	4.471E-02

Sr-85	#A	-1.6007E-02	-1.6382E-02	4.5583E-02	4.5592E-02	4.988E-02
Kr-85	#A	-3.9903E+02	-3.9904E+02	1.1897E+03	1.1899E+03	1.159E+03
Y-88	#B	0.0000E+00	0.0000E+00	4.3136E-02	4.3136E-02	5.585E-02
NB-94	#B	-1.0038E-02	-1.0038E-02	4.3992E-02	4.3996E-02	4.889E-02
Ag-108M	#B	-2.1464E-02	-2.1464E-02	5.1870E-02	5.1884E-02	5.794E-02
CD-109	#A	1.9817E-01	1.9883E-01	1.2066E+00	1.2067E+00	1.342E+00
SN-113	#B	2.3621E-04	2.3932E-04	4.9591E-02	4.9591E-02	5.717E-02
SB-125	#B	7.7896E-02	7.8012E-02	8.7215E-02	8.7327E-02	1.147E-01
I-131	#B	-9.6750E-03	-1.1663E-02	4.8487E-02	4.8491E-02	4.558E-02
CS-134	#B	-2.7770E-02	-2.7825E-02	5.7174E-02	5.7196E-02	5.963E-02
CS-137	#A	1.5102E-02	1.5104E-02	4.1005E-02	4.1014E-02	4.664E-02
CE-139	#A	-2.6233E-03	-2.6522E-03	3.9404E-02	3.9404E-02	3.893E-02
EU-152	#B	-5.2945E-03	-5.2962E-03	1.6867E-01	1.6867E-01	1.290E-01
EU-154	#B	1.1798E-02	1.1804E-02	8.2021E-02	8.2024E-02	9.196E-02
EU-155	#B	7.5497E-02	7.5560E-02	1.4019E-01	1.4025E-01	1.539E-01
HG-203	#B	-1.1473E-02	-1.1849E-02	4.1125E-02	4.1131E-02	4.465E-02
TL-208		2.3514E-01	2.3514E-01	7.9452E-02	8.0556E-02	
PB-212	#	4.9322E-01	4.9322E-01	1.1251E-01	1.1591E-01	9.230E-02
PB-214	#	2.8902E-01	2.8902E-01	9.6810E-02	9.8178E-02	7.867E-02
BI-212	#B	1.9933E-01	1.9933E-01	3.0505E-01	3.0526E-01	3.278E-01
BI-214		4.2572E-01	4.2572E-01	1.3895E-01	1.4101E-01	
RA-224	#A	6.9225E-01	6.9225E-01	1.0457E+00	1.0464E+00	1.141E+00
RA-226	#	1.3248E+00	1.3248E+00	1.0454E+00	1.0480E+00	1.098E+00
AC-228	#	3.9459E-01	3.9459E-01	1.6064E-01	1.6218E-01	1.735E-01
TH-227	#B	-9.3395E-02	-9.3395E-02	3.8136E-01	3.8140E-01	4.084E-01
PA-234	#B	-2.0690E-04	-2.0690E-04	1.4219E-01	1.4219E-01	1.604E-01
TH-234	#B	1.1085E+00	1.1085E+00	1.1296E+00	1.1313E+00	1.783E+00
AM-241	#A	-4.7446E-02	-4.7447E-02	2.6477E-01	2.6478E-01	2.688E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (277.1 to 1999.1 keV) 1.0885717E+01 pCi/gm
Total Decayed Activity (277.1 to 1999.1 keV) 1.0885717E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JJM

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 101F_13SEPT2006_1642.An1

Sample description
FSS-OOL-05-08-013-F

Spectrum Filename: C:\GammaVision\Spectra\101F_13SEPT2006_1642.An1

Acquisition information
Start time: 13-Sep-2006 16:42:44
Live time: 2000
Real time: 2002
Dead time: 0.09 %
Detector ID: 1

Detector system
Det 101- DSPE-633

Calibration
Filename: D1_1LSa.Clb
Detector 101 1.0 Liter Marinelli Sand

Energy Calibration
Created: 03-Sep-2004 08:50:48
Zero offset: 0.244 keV
Gain: 0.500 keV/channel
Quadratic: -2.493E-08 keV/channel^2

Efficiency Calibration
Created: 03-Sep-2004 08:52:26
Type: Polynomial
Uncertainty: 0.626 %
Coefficients: -0.321775 -5.816463 0.734234
-0.099357 0.006049 -0.000149

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.23keV)
Stop channel: 4000 (1999.11keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 1.6200E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.6200E+03) =
6.1728E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	12-Sep-2006 14:15:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	101_150K_28APR05.Pbc 01-May-2005 05:24:47
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 12 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.1245

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
74.75	187.	15.49	1.00	1.651E-02				
74.75	187.	15.49	1.00	1.651E-02	74.81	9.600	9.572E-01	PB212
74.95	156.	25.90	1.50	1.654E-02				
74.95	156.	25.90	1.50	1.654E-02	74.81	9.600	8.192E-01	PB212
77.08	231.	17.57	1.50	1.720E-02	77.11	17.500	6.403E-01	PB212
					77.11	10.700	1.030E+00	PB214
77.14	266.	11.08	1.01	1.720E-02	77.11	17.500	7.374E-01	PB212
					77.11	10.700	1.206E+00	PB214
87.28	91.	29.33	1.01	1.923E-02	86.45	32.740	1.212E-01	EU155
					88.04	3.790	PBC<MDA	CD109
93.60	74.	33.42	1.02	1.998E-02	92.80	3.000	PBC<MDA	TH234
128.57	73.	41.62	1.16	2.110E-02				
128.57	73.	41.62	1.16	2.110E-02	131.28	20.000	1.450E-01	PA234
186.32	94.	29.46	0.99	1.856E-02	185.99	3.280	1.289E+00	RA226
209.53	52.	36.89	0.79	1.720E-02				
238.84	666.	5.62	1.23	1.556E-02	238.63	43.100	8.202E-01	PB212
241.88	68.	26.85	1.12	1.540E-02	241.00	3.900	PBC<MDA	RA224
					241.92	7.470	4.939E-01	PB214
269.81	61.	32.15	1.12	1.402E-02				
295.36	105.	17.15	1.26	1.291E-02	295.22	19.200	3.457E-01	PB214
300.93	51.	36.20	1.33	1.269E-02				
338.65	150.	13.93	1.07	1.134E-02	338.40	12.010	9.021E-01	AC228
352.19	263.	8.94	0.98	1.092E-02	351.99	37.100	5.368E-01	PB214
510.32	95.	20.70	1.25	7.596E-03	510.72	22.500	3.843E-01	TL208
583.22	170.	11.38	1.54	6.684E-03	583.14	86.000	2.429E-01	TL208
609.48	161.	11.06	1.15	6.411E-03	609.32	46.090	4.501E-01	BI214
661.86	30.	32.66	1.69	5.935E-03	661.62	84.620	PBC<MDA	CS137

727.47	24.	40.31	1.50	5.443E-03	727.17	11.800	PBC<MDA	BI212
911.11	100.	14.48	1.68	4.446E-03	911.07	29.000	6.368E-01	AC228
968.43	117.	13.57	1.63	4.214E-03	968.90	17.460	1.321E+00	AC228
1120.59	42.	32.12	0.84	3.711E-03	1120.28	15.040	6.220E-01	BI214
1460.89	553.	4.34	1.95	2.942E-03	1460.75	10.700	1.460E+01	K40

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
1764.59	21.	21.82	0.73	2.481E-03	1764.51	15.920	4.342E-01	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
149.07	74.72	328.	187.	0.094	46.46	1.005	BI-207	D
372.29	186.32	294.	94.	0.047	88.37	0.989	PA-234	l
418.74	209.53	158.	52.	0.026	110.67	0.793	AC-228	
477.30	238.84	103.	571.	0.285	14.65	1.122	PB-212	D
539.35	269.81	136.	61.	0.031	96.45	1.120	AC-228	s
601.60	300.93	122.	51.	0.026	108.60	1.330	PB-212	s

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-212	149.48	74.95	796.	156.	0.078	77.69	1.499s
PB-212	153.79	77.11	708.	231.	0.116	52.70	1.499D
PB-214	153.79	77.11	316.	266.	0.133	33.24	1.006D
EU-155	174.05	87.24	688.	102.	0.051	113.06	1.499
TH-234	185.96	93.19	644.	92.	0.046	113.53	1.499s
PB-212	477.26	238.78	298.	454.	0.227	21.05	1.499
PB-214	483.54	241.92	137.	68.	0.034	80.54	1.124D
PB-214	590.47	295.36	105.	103.	0.051	51.44	1.259
AC-228	677.09	338.65	108.	147.	0.074	41.79	1.067
PB-214	704.17	352.19	92.	261.	0.130	26.81	0.976s
TL-208	1020.57	510.32	94.	79.	0.039	62.11	1.246s
TL-208	1166.39	583.19	44.	156.	0.078	32.23	1.528s
BI-214	1219.00	609.48	50.	159.	0.080	33.18	1.148
CS-137	1323.81	661.86	38.	31.	0.016	96.33	1.499
BI-212	1455.09	727.47	38.	24.	0.012	120.93	1.499
AC-228	1822.57	911.11	38.	98.	0.049	43.44	1.676s
AC-228	1937.27	968.43	36.	116.	0.058	40.71	1.633s
BI-214	2241.76	1120.59	40.	42.	0.021	96.36	0.839s
K-40	2922.80	1460.89	8.	551.	0.275	13.01	1.954
BI-214	3530.62	1764.59	0.	21.	0.010	65.47	0.729s

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	MDA Value pCi/gm	COMMENTS
BE-7		1.3855E-01					
			477.56	1.385E-01	%(	3.913E-01 1.17E-01	G
K-40		1.4596E+01					
			1460.75	1.460E+01	(P	4.228E-01 6.36E-01	G
MN-54		1.8735E-02					
			834.81	1.873E-02	&(P	5.223E-02 1.55E-02	G
CO-57		1.3995E-02					
			122.07	1.400E-02	%(	4.635E-02 1.39E-02	G K
			136.43	-6.992E-03	%	3.854E-01 1.14E-01	G
CO-60		5.6287E-03					
			1332.51	5.629E-03	%(P	6.102E-02 1.68E-02	G K
			1173.23	-1.531E-02	% P	9.222E-02 2.67E-02	G K
Sr-85		-1.1397E-02					
			514.00	-1.140E-02	%(	5.411E-02 1.59E-02	G
Kr-85		-2.9029E+02					
			513.99	-2.903E+02	%(P	1.242E+03 3.63E+02	G
Y-88		-5.8658E-03					
			1836.01	-5.866E-03	%(	4.715E-02 1.23E-02	G K
			898.02	-3.528E-04	& P	7.616E-02 2.14E-02	G
NB-94		1.4994E-02					
			871.10	1.499E-02	&(P	3.951E-02 1.17E-02	G K
			702.50	-8.219E-03	& P	5.379E-02 1.55E-02	G K
Ag-108M		5.2894E-03					
			722.95	5.289E-03	%(	5.601E-02 1.59E-02	G K
			614.37	2.576E-03	% P	4.344E-02 1.21E-02	G
			433.93	-1.676E-04	&	4.237E-02 1.20E-02	G
CD-109		-1.2680E-01					
			88.04	-1.268E-01	%(P	1.592E+00 4.75E-01	G
SN-113		-3.4644E-03					
			391.71	-3.464E-03	%(	6.199E-02 1.78E-02	G K
			255.04	-3.888E-01	% P	1.873E+00 5.55E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	4.0881E-03						
		427.95	4.088E-03	&(P	1.221E-01	3.46E-02	G K
		600.77	-3.589E-03	% P	2.511E-01	7.04E-02	G
		636.15	-1.703E-02	% P	3.524E-01	9.74E-02	G
		463.51	2.888E-01	% P	4.060E-01	1.26E-01	G
		176.29	-1.930E-02	% P	6.039E-01	1.77E-01	G
I-131	1.7126E-02						
		364.48	1.713E-02	%(	4.423E-02	1.33E-02	G K
		636.97	-1.146E-01	%	6.064E-01	1.74E-01	G
		284.29	-1.042E-01	%	7.197E-01	2.12E-01	G
CS-134	1.4217E-02						
		604.66	1.422E-02	&(P	4.267E-02	1.26E-02	G K
		795.76	1.744E-02	% P	4.350E-02	1.29E-02	G
		569.29	1.403E-01	& P	2.387E-01	7.37E-02	G
		801.84	-6.012E-02	&	5.431E-01	1.53E-01	G
CS-137	5.1810E-02						
		661.62	5.181E-02	(P	5.215E-02	1.71E-02	G
CE-139	2.7273E-03						
		165.85	2.727E-03	%(P	4.706E-02	1.39E-02	G
EU-152	3.3423E-02						
		121.78	3.342E-02	&(P	1.408E-01	4.21E-02	G K
		344.30	2.366E-02	& P	1.249E-01	3.65E-02	G
		1408.08	-3.318E-03	& P	1.993E-01	4.94E-02	G
		964.00	2.211E-03	% P	4.236E-01	1.17E-01	G
		1112.07	-5.789E-02	% P	5.650E-01	1.61E-01	G
		778.90	3.601E-02	% P	2.475E-01	6.81E-02	G
EU-154	-2.4148E-02						
		123.10	-2.415E-02	%(P	1.126E-01	3.37E-02	G K
		1274.80	-1.575E-04	& P	3.056E-01	8.69E-02	G
		723.30	4.242E-02	% P	1.868E-01	5.33E-02	G
		1004.80	6.075E-02	& P	3.101E-01	8.86E-02	G
EU-155	1.3618E-01						
		86.45	1.362E-01	(	1.668E-01	5.13E-02	G K
		105.31	5.037E-02	%	2.088E-01	6.26E-02	G
HG-203	1.0202E-02						
		279.17	1.020E-02	&(	4.171E-02	1.23E-02	G K
		72.87	-3.030E-01	% P	1.023E+00	3.07E-01	G
		70.83	-8.426E-01	%	2.226E+00	6.72E-01	G
		82.50	-6.561E-02	%	2.844E+00	8.47E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	2.2582E-01						
		583.14	2.258E-01	@(P	4.898E-02	2.46E-02	G
		510.72	3.843E-01	+ P	2.343E-01	9.57E-02	G
PB-212	5.8646E-01						
		238.63	5.646E-01	(P	1.033E-01	4.02E-02	G K
							Energy duplication
		77.11	6.403E-01	@(	3.512E-01	1.12E-01	G
		74.81	8.192E-01	& P	7.048E-01	2.19E-01	G
PB-214	5.2962E-01						
		351.99	5.368E-01	@(P	9.766E-02	4.84E-02	G K
		295.22	3.457E-01	- P	1.698E-01	6.03E-02	G
							Energy duplication
		77.11	1.206E+00	+ P	3.876E-01	1.36E-01	G
		241.92	4.939E-01	(P	4.150E-01	1.34E-01	G
BI-212	3.1364E-01						
		727.17	3.136E-01	(P	4.100E-01	1.30E-01	G K
		1620.56	1.716E-01	%	1.460E+00	3.77E-01	G
		785.42	2.934E-01	& P	2.772E+00	7.88E-01	G
BI-214	4.4605E-01						
		609.32	4.501E-01	(P	1.002E-01	5.01E-02	G K
		1764.51	4.342E-01	(P	1.556E-01	9.68E-02	G
		1120.28	6.220E-01	+ P	4.831E-01	2.02E-01	G
RA-224	7.5014E-01						
		241.00	7.501E-01	%(P	1.313E+00	4.00E-01	G
RA-226	9.4728E-01						
		185.99	9.473E-01	%(	1.347E+00	4.14E-01	G
AC-228	7.1447E-01						
		911.07	6.368E-01	@(P	2.023E-01	9.40E-02	G K
		968.90	1.321E+00	+ P	3.457E-01	1.80E-01	G
		338.40	9.021E-01	(P	3.124E-01	1.28E-01	G
TH-227	-2.6059E-01						
		236.00	-2.606E-01	%(P	4.960E-01	1.51E-01	G K
		256.25	-1.705E-02	% P	6.192E-01	1.81E-01	G
PA-234	7.2199E-03						
		98.44	7.220E-03	%(	1.952E-01	5.80E-02	G K
		946.00	-5.580E-02	%	3.221E-01	9.27E-02	G
		131.28	-1.962E-03	%	1.978E-01	5.84E-02	G
		94.67	3.120E-03	%	3.364E-01	9.99E-02	G
		883.24	-6.257E-02	%	4.267E-01	1.21E-01	G
		926.70	0.000E+00	&	6.322E-01	1.78E-01	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26 2.132E-01 &   3.517E-01 1.09E-01 G

TH-234       1.1931E+00
                           63.29 1.125E+00 %(P 2.259E+00 6.83E-01 G K
                           92.80 1.282E+00 *(P 1.690E+00 5.18E-01 G
                           92.38-2.645E-01 & P 2.090E+00 6.17E-01 G

AM-241      -1.1627E-01
                           59.54-1.163E-01 &(P 3.256E-01 9.81E-02 G
   ( - This peak used in the nuclide activity average.

   * - Peak is too wide, but only one peak in library.
   ! - Peak is part of a multiplet and this area went
       negative during deconvolution.
   ? - Peak is too narrow.
   @ - Peak is too wide at FW25M, but ok at FWHM.
   % - Peak fails sensitivity test.
   $ - Peak identified, but first peak of this nuclide
       failed one or more qualification tests.
   + - Peak activity higher than counting uncertainty range.
   - - Peak activity lower than counting uncertainty range.
   = - Peak outside analysis energy range.
   & - Calculated peak centroid is not close enough to the
       library energy centroid for positive identification.
   P - Peakbackground subtraction
   } - Peak is too close to another for the activity
       to be found directly.

   Nuclide Codes:                      Peak Codes:
   T - Thermal Neutron Activation      G - Gamma Ray
   F - Fast Neutron Activation         X - X-Ray
   I - Fission Product                 P - Positron Decay
   N - Naturally Occurring Isotope     S - Single-Escape
   P - Photon Reaction                 D - Double-Escape
   C - Charged Particle Reaction       K - Key Line
   M - No MDA Calculation              A - Not in Average
   R - Coincidence Corrected           C - Coincidence Peak
   H - Halflife limit exceeded

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
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***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	1.3658E-01	1.3855E-01	3.4977E-01	3.4986E-01	3.857E-01
K-40		1.4596E+01	1.4596E+01	1.9073E+00	2.0780E+00	
MN-54	#A	1.8689E-02	1.8735E-02	4.6404E-02	4.6416E-02	5.210E-02
CO-57	#B	1.3956E-02	1.3995E-02	4.1763E-02	4.1770E-02	4.622E-02
CO-60	#B	5.6264E-03	5.6287E-03	5.0378E-02	5.0379E-02	6.100E-02

Sr-85	#A	-1.1264E-02	-1.1397E-02	4.7713E-02	4.7717E-02	5.348E-02
Kr-85	#A	-2.9028E+02	-2.9029E+02	1.3419E+03	1.3420E+03	1.242E+03
Y-88	#B	-5.8239E-03	-5.8658E-03	3.6829E-02	3.6830E-02	4.681E-02
NB-94	#B	1.4994E-02	1.4994E-02	3.5119E-02	3.5129E-02	3.951E-02
Ag-108M	#B	5.2893E-03	5.2894E-03	4.7688E-02	4.7689E-02	5.601E-02
CD-109	#A	-1.2658E-01	-1.2680E-01	1.5504E+00	1.5504E+00	1.589E+00
SN-113	#B	-3.4415E-03	-3.4644E-03	5.3545E-02	5.3545E-02	6.158E-02
SB-125	#B	4.0850E-03	4.0881E-03	1.0390E-01	1.0390E-01	1.220E-01
I-131	#B	1.5573E-02	1.7126E-02	3.9759E-02	3.9771E-02	4.022E-02
CS-134	#B	1.4202E-02	1.4217E-02	3.7756E-02	3.7765E-02	4.262E-02
CS-137	#A	5.1806E-02	5.1810E-02	5.1322E-02	5.1406E-02	5.214E-02
CE-139	#A	2.7122E-03	2.7273E-03	4.1679E-02	4.1679E-02	4.680E-02
EU-152	#B	3.3418E-02	3.3423E-02	1.2639E-01	1.2640E-01	1.407E-01
EU-154	#B	-2.4142E-02	-2.4148E-02	1.0877E-01	1.0878E-01	1.126E-01
EU-155	#A	1.3612E-01	1.3618E-01	1.5397E-01	1.5415E-01	1.667E-01
HG-203	#B	1.0036E-02	1.0202E-02	3.7043E-02	3.7048E-02	4.103E-02
TL-208	#	2.2582E-01	2.2582E-01	7.3902E-02	7.4995E-02	
PB-212	#	5.8646E-01	5.8646E-01	1.2513E-01	1.2944E-01	1.033E-01
PB-214		5.2962E-01	5.2962E-01	1.4305E-01	1.4615E-01	
BI-212	#A	3.1364E-01	3.1364E-01	3.8994E-01	3.9034E-01	4.100E-01
BI-214		4.4605E-01	4.4605E-01	1.4902E-01	1.5114E-01	
RA-224	#A	7.5014E-01	7.5014E-01	1.1999E+00	1.2006E+00	1.313E+00
RA-226	#A	9.4728E-01	9.4728E-01	1.2408E+00	1.2419E+00	1.347E+00
AC-228		7.1447E-01	7.1447E-01	2.1899E-01	2.2268E-01	
TH-227	#B	-2.6059E-01	-2.6059E-01	4.5925E-01	4.5949E-01	4.960E-01
PA-234	#B	7.2199E-03	7.2199E-03	1.7403E-01	1.7404E-01	1.952E-01
TH-234	#B	1.1931E+00	1.1931E+00	1.3060E+00	1.3076E+00	2.259E+00
AM-241	#A	-1.1627E-01	-1.1627E-01	3.0664E-01	3.0671E-01	3.256E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (269.6 to 1999.1 keV) 1.6512409E+01 pCi/gm
Total Decayed Activity (269.6 to 1999.1 keV) 1.6512409E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JJM

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 101F_13SEPT2006_1720.An1

Sample description
FSS-OOL-05-08-002-F

Spectrum Filename: C:\GammaVision\Spectra\101F_13SEPT2006_1720.An1

Acquisition information

Start time:	13-Sep-2006 17:20:19
Live time:	2000
Real time:	2002
Dead time:	0.08 %
Detector ID:	1

Detector system
Det 101- DSPE-633

Calibration

Filename:	D1_1LSa.Clb

Detector 101 1.0 Liter Marinelli Sand

Energy Calibration

Created:	03-Sep-2004 08:50:48
Zero offset:	0.244 keV
Gain:	0.500 keV/channel
Quadratic:	-2.493E-08 keV/channel^2

Efficiency Calibration

Created:	03-Sep-2004 08:52:26
Type:	Polynomial
Uncertainty:	0.626 %
Coefficients:	-0.321775 -5.816463 0.734234
	-0.099357 0.006049 -0.000149

Library Files

Main analysis library:	FSS_Rev_1.Lib
Library Match Width:	1.000
Peak stripping:	Library based

Analysis parameters

Analysis engine:	Env32 G53W4.20
Start channel:	100 (50.23keV)
Stop channel:	4000 (1999.11keV)
Peak rejection level:	41.667%
Peak search sensitivity:	3
Sample Size:	1.4080E+03
Activity scaling factor:	1.0000E+06/(1.0000E+00* 1.4080E+03) = 7.1023E+02
Detection limit method:	Nureg 4.16
Random error:	1.0000000E+00
Systematic error:	1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	11-Sep-2006 12:45:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	101_150K_28APR05.Pbc 01-May-2005 05:24:47
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 15 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.1704

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
74.83	204.	13.25	1.00	1.654E-02	74.81	9.600	1.233E+00	PB212
77.13	238.	10.05	1.01	1.720E-02	77.11	17.500	8.988E-01	PB212
					77.11	10.700	1.451E+00	PB214
83.87	121.	20.85	0.88	1.868E-02				
93.18	85.	39.28	1.50	1.989E-02	92.80	3.000	PBC<MDA	TH234
					94.67	15.500	PBC<MDA	PA234
186.09	89.	35.12	1.23	1.858E-02	185.99	3.280	1.400E+00	RA226
209.44	85.	26.25	1.39	1.721E-02				
238.78	648.	4.56	1.12	1.557E-02	238.63	43.100	9.182E-01	PB212
242.01	70.	25.88	1.12	1.540E-02	241.00	3.900	PBC<MDA	RA224
					241.92	7.470	5.798E-01	PB214
270.30	72.	28.78	0.71	1.400E-02				
295.28	135.	14.00	1.05	1.292E-02	295.22	19.200	5.147E-01	PB214
300.25	46.	38.31	1.45	1.272E-02				
338.60	128.	18.49	1.26	1.134E-02	338.40	12.010	8.859E-01	AC228
352.12	194.	10.17	0.94	1.092E-02	351.99	37.100	4.542E-01	PB214
463.08	44.	33.17	1.20	8.349E-03				
463.08	44.	33.17	1.20	8.349E-03	463.51	10.000	4.915E-01	SB125
510.95	90.	21.95	1.15	7.587E-03	510.72	22.500	4.168E-01	TL208
583.27	167.	12.01	1.43	6.683E-03	583.14	86.000	2.755E-01	TL208
609.26	147.	10.52	1.32	6.413E-03	609.32	46.090	4.731E-01	BI214
661.45	109.	15.67	1.78	5.939E-03	661.62	84.620	2.058E-01	CS137
726.38	63.	17.63	0.91	5.448E-03				
726.38	63.	17.63	0.91	5.448E-03	727.17	11.800	9.328E-01	BI212
911.30	129.	12.15	1.57	4.446E-03	911.07	29.000	9.477E-01	AC228
968.54	99.	14.31	1.26	4.214E-03	968.90	17.460	1.288E+00	AC228
1120.47	22.	40.89	1.71	3.711E-03	1120.28	15.040	PBC<MDA	BI214

1460.77	446.	4.81	1.87	2.942E-03	1460.75	10.700	1.352E+01	K40
1764.85	14.	34.58	2.11	2.481E-03	1764.51	15.920	3.503E-01	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
418.55	209.44	190.	85.	0.043	78.75	1.392	AC-228	s
540.33	270.30	150.	72.	0.036	86.33	0.711	AC-228	s
600.24	300.25	109.	46.	0.023	114.93	1.446	PB-212	s
1452.91	726.38	51.	33.	0.017	105.08	0.910	J-132	s

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-212	149.19	74.81	285.	204.	0.102	39.76	1.005D
PB-212	153.79	77.11	317.	238.	0.119	30.16	1.006A
RA-226	372.07	186.21	340.	75.	0.038	109.61	1.499
PB-212	476.96	238.63	119.	642.	0.321	13.68	1.122D
PB-214	483.54	241.92	133.	67.	0.034	80.29	1.124D
PB-214	590.30	295.28	98.	133.	0.067	41.99	1.051
AC-228	676.98	338.60	146.	126.	0.063	55.46	1.260
PB-214	704.04	352.12	83.	192.	0.096	30.52	0.940s
SB-125	925.65	462.88	52.	40.	0.020	87.22	1.499
TL-208	1021.84	510.95	105.	74.	0.037	65.86	1.145
TL-208	1166.55	583.27	72.	165.	0.083	36.02	1.435s
BI-214	1218.55	609.26	36.	146.	0.073	31.55	1.324s
CS-137	1323.00	661.45	47.	108.	0.054	47.01	1.780s
BI-212	1454.63	727.24	33.	34.	0.017	86.23	1.499s
AC-228	1822.95	911.30	40.	127.	0.064	36.45	1.573s
AC-228	1937.49	968.54	29.	99.	0.049	42.93	1.262
BI-214	2241.53	1120.47	30.	22.	0.011	122.68	1.713
K-40	2922.55	1460.77	5.	444.	0.222	14.42	1.870
BI-214	3531.13	1764.85	6.	14.	0.007	103.73	2.106s

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Code	MDA Value pCi/gm	COMMENTS
BE-7		3.0064E-01					
			477.56	3.006E-01	%(	4.138E-01 1.30E-01	G
K-40		1.3520E+01					
			1460.75	1.352E+01	(P	4.152E-01 6.53E-01	G
MN-54		-4.6611E-04					
			834.81	-4.661E-04	&(P	6.777E-02 1.88E-02	G
CO-57		1.3307E-02					
			122.07	1.331E-02	&(	5.505E-02 1.65E-02	G K
			136.43	-7.130E-02	&	4.623E-01 1.38E-01	G
CO-60		1.7416E-02					
			1332.51	1.742E-02	&(P	6.159E-02 1.77E-02	G K
			1173.23	-3.751E-03	& P	1.101E-01 3.13E-02	G K
Sr-85		-7.6901E-03					
			514.00	-7.690E-03	%(	6.540E-02 1.90E-02	G
Kr-85		-1.6495E+02					
			513.99	-1.650E+02	%(P	1.452E+03 4.18E+02	G
Y-88		-6.3653E-03					
			1836.01	-6.365E-03	%(	6.611E-02 1.75E-02	G K
			898.02	6.842E-03	% P	5.783E-02 1.61E-02	G
NB-94		8.7194E-03					
			871.10	8.719E-03	%(P	5.525E-02 1.56E-02	G K
			702.50	-8.791E-04	% P	6.019E-02 1.69E-02	G K
Ag-108M		-1.0412E-02					
			722.95	-1.041E-02	%(	6.519E-02 1.87E-02	G K
			614.37	3.934E-03	& P	4.385E-02 1.22E-02	G
			433.93	2.395E-04	&	4.464E-02 1.26E-02	G
CD-109		6.9361E-01					
			88.04	6.936E-01	%(P	1.636E+00 4.95E-01	G
SN-113		0.0000E+00					
			391.71	0.000E+00	%(	8.474E-02 2.44E-02	G K
			255.04	8.504E-01	% P	1.851E+00 5.60E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	1.4891E-01						
		427.95	4.486E-02	&(P	1.435E-01	4.25E-02	G K
		600.77	3.108E-02	% P	2.900E-01	8.28E-02	G
		636.15	6.257E-03	& P	4.790E-01	1.34E-01	G
		463.51	4.569E-01	(P	4.195E-01	1.38E-01	G
		176.29	2.199E-01	% P	6.610E-01	1.98E-01	G
I-131	5.7134E-04						
		364.48	5.713E-04	&(	6.559E-02	1.88E-02	G K
		636.97	-1.082E-01	%	9.256E-01	2.65E-01	G
		284.29	2.687E-01	%	8.617E-01	2.57E-01	G
CS-134	-2.3503E-02						
		604.66	-2.350E-02	%(P	7.094E-02	2.10E-02	G K
		795.76	-7.342E-03	% P	7.272E-02	2.05E-02	G
		569.29	5.175E-02	& P	3.480E-01	1.00E-01	G
		801.84	-5.396E-03	%	5.657E-01	1.54E-01	G
CS-137	2.0579E-01						
		661.62	2.058E-01	(P	6.640E-02	3.25E-02	G
CE-139	7.0206E-03						
		165.85	7.021E-03	%(P	5.760E-02	1.71E-02	G
EU-152	-1.8214E-02						
		121.78	-1.821E-02	&(P	1.659E-01	4.93E-02	G K
		344.30	-1.633E-02	% P	1.776E-01	5.16E-02	G
		1408.08	1.608E-02	% P	2.626E-01	6.89E-02	G
		964.00	5.672E-02	% P	4.477E-01	1.26E-01	G
		1112.07	-4.772E-02	% P	5.532E-01	1.55E-01	G
		778.90	3.443E-02	% P	4.189E-01	1.17E-01	G
EU-154	2.2885E-02						
		123.10	2.288E-02	&(P	1.215E-01	3.63E-02	G K
		1274.80	-3.610E-02	% P	2.339E-01	6.65E-02	G
		723.30	-4.758E-02	& P	3.115E-01	8.91E-02	G
		1004.80	-1.770E-02	% P	3.502E-01	9.63E-02	G
EU-155	3.2710E-03						
		86.45	3.271E-03	&(	2.104E-01	6.26E-02	G K
		105.31	1.532E-01	%	2.206E-01	6.77E-02	G
HG-203	2.7130E-02						
		279.17	2.713E-02	%(	5.342E-02	1.62E-02	G K
		72.87	-4.478E-01	% P	1.478E+00	4.45E-01	G
		70.83	-1.778E+00	&	2.555E+00	7.82E-01	G
		82.50	-2.043E+00	&	3.014E+00	9.22E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	2.7552E-01						
		583.14	2.755E-01	@(P	7.053E-02	3.36E-02	G
		510.72	4.168E-01	+ P	2.834E-01	1.11E-01	G
PB-212	9.1259E-01						
		238.63	9.182E-01	(P	7.660E-02	4.23E-02	G K
							Energy duplication
		77.11	7.595E-01	}	2.732E-01	7.64E-02	G
		74.81	1.233E+00	+ P	4.919E-01	1.68E-01	G
PB-214	4.8507E-01						
		351.99	4.542E-01	@(P	1.071E-01	4.67E-02	G K
		295.22	5.147E-01	(P	1.889E-01	7.30E-02	G
							Energy duplication
		77.11	0.000E+00	} P	6.226E-01	0.00E+00	G
		241.92	5.622E-01	(P	4.703E-01	1.52E-01	G
BI-212	5.1072E-01						
		727.17	5.107E-01	*(P	4.431E-01	1.50E-01	G K
		1620.56	4.400E-01	&	1.818E+00	5.05E-01	G
		785.42	8.584E-01	& P	3.012E+00	8.82E-01	G
BI-214	4.7310E-01						
		609.32	4.731E-01	@(P	9.998E-02	5.01E-02	G K
		1764.51	3.503E-01	- P	3.478E-01	1.25E-01	G
		1120.28	3.709E-01	- P	4.832E-01	1.54E-01	G
RA-224	8.4788E-01						
		241.00	8.479E-01	%(P	1.557E+00	4.74E-01	G
RA-226	1.1842E+00						
		185.99	1.184E+00	(	1.396E+00	4.33E-01	G
AC-228	1.0366E+00						
		911.07	9.477E-01	@(P	2.386E-01	1.17E-01	G K
		968.90	1.288E+00	(P	3.646E-01	1.86E-01	G
		338.40	8.859E-01	(P	4.158E-01	1.67E-01	G
TH-227	-3.0523E-01						
		236.00	-3.052E-01	%(P	5.637E-01	1.71E-01	G K
		256.25	3.475E-02	& P	4.899E-01	1.42E-01	G
PA-234	-5.8032E-02						
		98.44	-5.803E-02	&(	1.908E-01	5.73E-02	G K
		946.00	-1.817E-02	&	3.410E-01	9.54E-02	G
		131.28	-8.721E-03	&	2.448E-01	7.25E-02	G
		94.67	3.283E-03	%	3.596E-01	1.07E-01	G
		883.24	0.000E+00	&	5.497E-01	1.52E-01	G
		926.70	-1.421E-01	&	6.711E-01	1.95E-01	G

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 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26 8.268E-02 &   5.134E-01 1.49E-01 G

TH-234       8.6364E-01
                           63.29 8.636E-01 %(P 2.375E+00 7.13E-01 G K
                           92.80 1.371E+00 % P 1.887E+00 5.78E-01 G
                           92.38 2.270E-01 & P 2.078E+00 6.16E-01 G

AM-241      -1.4082E-01
                           59.54-1.408E-01 &(P 3.789E-01 1.14E-01 G
   ( - This peak used in the nuclide activity average.

   * - Peak is too wide, but only one peak in library.
   ! - Peak is part of a multiplet and this area went
       negative during deconvolution.
   ? - Peak is too narrow.
   @ - Peak is too wide at FW25M, but ok at FWHM.
   % - Peak fails sensitivity test.
   $ - Peak identified, but first peak of this nuclide
       failed one or more qualification tests.
   + - Peak activity higher than counting uncertainty range.
   - - Peak activity lower than counting uncertainty range.
   = - Peak outside analysis energy range.
   & - Calculated peak centroid is not close enough to the
       library energy centroid for positive identification.
   P - Peakbackground subtraction
   } - Peak is too close to another for the activity
       to be found directly.

   Nuclide Codes:                      Peak Codes:
   T - Thermal Neutron Activation      G - Gamma Ray
   F - Fast Neutron Activation         X - X-Ray
   I - Fission Product                 P - Positron Decay
   N - Naturally Occurring Isotope     S - Single-Escape
   P - Photon Reaction                 D - Double-Escape
   C - Charged Particle Reaction       K - Key Line
   M - No MDA Calculation              A - Not in Average
   R - Coincidence Corrected           C - Coincidence Peak
   H - Halflife limit exceeded

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
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***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	2.9221E-01	3.0064E-01	3.9091E-01	3.9127E-01	4.022E-01
K-40		1.3520E+01	1.3520E+01	1.9598E+00	2.1034E+00	
MN-54	#A	-4.6385E-04	-4.6611E-04	1.9799E-01	1.9799E-01	6.744E-02
CO-57	#B	1.3232E-02	1.3307E-02	4.9453E-02	4.9458E-02	5.474E-02
CO-60	#B	1.7403E-02	1.7416E-02	5.3205E-02	5.3214E-02	6.154E-02

Sr-85	#A	-7.5121E-03	-7.6901E-03	5.7109E-02	5.7111E-02	6.389E-02
Kr-85	#A	-1.6495E+02	-1.6495E+02	1.9265E+03	1.9265E+03	1.452E+03
Y-88	#B	-6.2753E-03	-6.3653E-03	5.2368E-02	5.2369E-02	6.517E-02
NB-94	#B	8.7194E-03	8.7194E-03	4.6897E-02	4.6899E-02	5.525E-02
Ag-108M	#B	-1.0412E-02	-1.0412E-02	5.6205E-02	5.6208E-02	6.518E-02
CD-109	#A	6.9129E-01	6.9361E-01	1.4847E+00	1.4852E+00	1.631E+00
SN-113	#B	0.0000E+00	0.0000E+00	7.3350E-02	7.3350E-02	8.363E-02
SB-125	#F	1.4868E-01	1.4891E-01	1.3462E-01	1.3489E-01	1.433E-01
I-131	#B	4.7299E-04	5.7134E-04	5.6442E-02	5.6442E-02	5.430E-02
CS-134	#B	-2.3456E-02	-2.3503E-02	6.8389E-02	6.8402E-02	7.080E-02
CS-137		2.0577E-01	2.0579E-01	9.7531E-02	9.8222E-02	
CE-139	#A	6.9435E-03	7.0206E-03	5.1291E-02	5.1292E-02	5.697E-02
EU-152	#B	-1.8208E-02	-1.8214E-02	1.6913E-01	1.6914E-01	1.659E-01
EU-154	#B	2.2873E-02	2.2885E-02	1.0886E-01	1.0887E-01	1.214E-01
EU-155	#B	3.2683E-03	3.2710E-03	1.8791E-01	1.8791E-01	2.103E-01
HG-203	#B	2.6260E-02	2.7130E-02	4.8728E-02	4.8752E-02	5.171E-02
TL-208		2.7552E-01	2.7552E-01	1.0068E-01	1.0187E-01	
PB-212		9.1259E-01	9.1259E-01	1.2606E-01	1.3620E-01	
PB-214		4.8507E-01	4.8507E-01	1.4956E-01	1.5205E-01	
BI-212	#	5.1072E-01	5.1072E-01	4.4911E-01	4.5004E-01	4.431E-01
BI-214	#	4.7310E-01	4.7310E-01	1.5039E-01	1.5275E-01	
RA-224	#A	8.4788E-01	8.4788E-01	1.4209E+00	1.4217E+00	1.557E+00
RA-226	#A	1.1842E+00	1.1842E+00	1.2981E+00	1.2998E+00	1.396E+00
AC-228		1.0366E+00	1.0366E+00	2.7689E-01	2.8302E-01	
TH-227	#B	-3.0523E-01	-3.0523E-01	5.2226E-01	5.2254E-01	5.637E-01
PA-234	#B	-5.8032E-02	-5.8032E-02	1.7196E-01	1.7199E-01	1.908E-01
TH-234	#B	8.6364E-01	8.6364E-01	2.1396E+00	2.1401E+00	2.375E+00
AM-241	#A	-1.4082E-01	-1.4082E-01	3.5639E-01	3.5647E-01	3.789E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (258.6 to 1999.1 keV) 1.6908873E+01 pCi/gm
Total Decayed Activity (258.6 to 1999.1 keV) 1.6908901E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JJM

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 101F_13SEPT2006_1801.An1

Sample description
FSS-OOL-05-08-001-F

Spectrum Filename: C:\GammaVision\Spectra\101F_13SEPT2006_1801.An1

Acquisition information
Start time: 13-Sep-2006 18:01:09
Live time: 2000
Real time: 2002
Dead time: 0.09 %
Detector ID: 1

Detector system
Det 101- DSPE-633

Calibration
Filename: D1_1LSa.Clb
Detector 101 1.0 Liter Marinelli Sand

Energy Calibration
Created: 03-Sep-2004 08:50:48
Zero offset: 0.244 keV
Gain: 0.500 keV/channel
Quadratic: -2.493E-08 keV/channel^2

Efficiency Calibration
Created: 03-Sep-2004 08:52:26
Type: Polynomial
Uncertainty: 0.626 %
Coefficients: -0.321775 -5.816463 0.734234
-0.099357 0.006049 -0.000149

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.23keV)
Stop channel: 4000 (1999.11keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 1.9300E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.9300E+03) =
5.1813E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	09-Sep-2006 07:36:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	101_150K_28APR05.Pbc 01-May-2005 05:24:47
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 12 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.1001

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
74.78	118.	35.91	1.50	1.654E-02	74.81	9.600	PBC<MDA	PB212
77.13	262.	16.27	1.50	1.720E-02	77.11	10.700	9.961E-01	PB214
					77.11	17.500	6.091E-01	PB212
77.13	266.	16.27	1.50	1.720E-02	77.11	10.700	9.961E-01	PB214
					77.11	17.500	6.177E-01	PB212
87.13	99.	26.96	1.01	1.921E-02	86.45	32.740	1.107E-01	EU155
					88.04	3.790	PBC<MDA	CD109
90.02	71.	35.66	1.02	1.959E-02				
93.38	116.	22.44	1.02	1.996E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
186.12	137.	17.96	1.29	1.858E-02	185.99	3.280	1.572E+00	RA226
209.40	61.	37.75	1.41	1.721E-02				
238.82	654.	4.44	1.12	1.556E-02	238.63	43.100	6.756E-01	PB212
241.72	97.	22.00	1.12	1.541E-02	241.00	3.900	PBC<MDA	RA224
					241.92	7.470	PBC<MDA	PB214
270.79	47.	35.03	0.86	1.398E-02				
295.29	146.	13.93	1.26	1.292E-02	295.22	19.200	4.065E-01	PB214
300.25	46.	32.39	1.45	1.272E-02				
338.65	125.	18.87	1.17	1.134E-02	338.40	12.010	6.298E-01	AC228
351.93	264.	9.87	1.04	1.093E-02				
351.93	264.	9.87	1.04	1.093E-02	351.99	37.100	4.518E-01	PB214
463.31	32.	36.11	1.50	8.342E-03	463.51	10.000	PBC<MDA	SB125
511.02	82.	23.80	1.19	7.586E-03	510.72	22.500	2.688E-01	TL208
583.23	199.	9.19	1.58	6.684E-03	583.14	86.000	2.400E-01	TL208
609.51	195.	9.85	1.29	6.411E-03	609.32	46.090	4.593E-01	BI214
680.02	33.	35.21	1.08	5.789E-03				
727.18	39.	27.25	1.63	5.443E-03	727.17	11.800	4.200E-01	BI212

860.81	34.	37.65	0.87	4.676E-03				
911.24	117.	10.36	1.47	4.446E-03	911.07	29.000	6.252E-01	AC228
968.28	97.	14.53	1.36	4.215E-03	968.90	17.460	9.205E-01	AC228
1118.84	78.	18.31	1.17	3.715E-03	1120.28	15.040	9.788E-01	BI214
1460.93	504.	4.68	2.00	2.942E-03	1460.75	10.700	1.115E+01	K40
1765.00	27.	19.25	2.06	2.481E-03	1764.51	15.920	4.708E-01	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide
173.83	87.24	304.	99.	0.049	80.87	1.014	PB-214 lD
179.63	90.14	281.	71.	0.035	106.99	1.016	PB-214 lD
418.48	209.40	215.	61.	0.031	113.25	1.414	AC-228 s
477.35	238.85	94.	654.	0.327	13.32	1.122	PB-212 D
483.14	241.74	178.	97.	0.048	66.01	1.124	PB-214 D
541.30	270.79	112.	47.	0.023	105.08	0.858	AC-228
600.26	300.25	88.	46.	0.023	97.17	1.449	PB-212 s
1360.15	680.02	34.	33.	0.016	105.63	1.077	RH-106M
1721.92	860.81	39.	34.	0.017	93.69	0.871	TL-208 s

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-212	149.19	74.81	930.	118.	0.059	107.72	1.499D
PB-214	153.79	77.11	805.	262.	0.131	48.82	1.499D
PB-212	153.79	77.11	801.	266.	0.133	48.82	1.499D
TH-234	185.97	93.19	725.	127.	0.063	86.33	1.499s
TH-234	185.96	93.19	691.	133.	0.066	83.82	1.499s
RA-226	372.10	186.22	362.	142.	0.071	62.27	1.499s
PB-212	477.31	238.81	315.	542.	0.271	18.68	1.499
PB-214	590.59	295.42	158.	145.	0.073	43.65	1.499
AC-228	677.08	338.65	150.	123.	0.061	56.61	1.167s
PB-214	703.85	352.03	110.	246.	0.123	26.05	1.499
SB-125	926.52	463.31	58.	32.	0.016	108.32	1.499
TL-208	1022.48	511.27	108.	72.	0.036	67.46	1.197s
TL-208	1166.46	583.23	51.	197.	0.099	27.56	1.585
BI-214	1219.05	609.51	59.	194.	0.097	29.55	1.291
BI-212	1454.52	727.18	29.	39.	0.019	81.74	1.633s
AC-228	1822.83	911.24	15.	115.	0.058	31.08	1.468
AC-228	1936.97	968.28	29.	97.	0.048	43.60	1.357s
BI-214	2238.27	1118.84	34.	78.	0.039	54.93	1.166s
K-40	2922.87	1460.93	15.	501.	0.251	14.03	2.004
BI-214	3531.44	1765.00	0.	27.	0.013	57.74	2.061s

s - Peak fails shape tests.
D - Peak area deconvoluted.

A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	Peak MDA Value pCi/gm	COMMENTS
BE-7		1.9940E-02					
			477.56	1.994E-02	%(	3.513E-01 1.00E-01	G
K-40		1.1149E+01					
			1460.75	1.115E+01	(P	4.573E-01 5.24E-01	G
MN-54		-7.3882E-03					
			834.81	-7.388E-03	&(P	4.737E-02 1.35E-02	G
CO-57		1.9905E-03					
			122.07	1.991E-03	%(	4.592E-02 1.36E-02	G K
			136.43	-7.849E-02	%	3.793E-01 1.14E-01	G
CO-60		-1.9056E-04					
			1332.51	-1.906E-04	&(P	3.689E-02 9.34E-03	G K
			1173.23	-5.154E-04	% P	5.944E-02 1.64E-02	G K
Sr-85		-5.6008E-03					
			514.00	-5.601E-03	&(	5.066E-02 1.48E-02	G
Kr-85		-1.4910E+02					
			513.99	-1.491E+02	&(P	1.121E+03 3.25E+02	G
Y-88		-9.0764E-05					
			1836.01	-9.076E-05	&(	5.123E-02 1.31E-02	G K
			898.02	-2.163E-04	& P	4.837E-02 1.32E-02	G
NB-94		-2.5248E-04					
			871.10	-2.525E-04	%(P	3.439E-02 9.16E-03	G K
			702.50	9.963E-04	% P	4.247E-02 1.19E-02	G K
Ag-108M		-1.1069E-02					
			722.95	-1.107E-02	%(	5.440E-02 1.58E-02	G K
			614.37	-1.604E-02	% P	5.025E-02 1.49E-02	G
			433.93	1.550E-02	%	2.960E-02 9.05E-03	G
CD-109		-2.5004E-02					
			88.04	-2.500E-02	%(P	1.364E+00 4.06E-01	G
SN-113		0.0000E+00					
			391.71	0.000E+00	%(	6.185E-02 1.78E-02	G K
			255.04	-2.651E-01	% P	1.786E+00 5.28E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	6.3823E-02						
		427.95	-5.597E-03	&(P	1.251E-01	3.59E-02	G K
		600.77	-2.445E-02	& P	2.012E-01	5.73E-02	G
		636.15	-1.335E-03	% P	2.596E-01	7.01E-02	G
		463.51	2.693E-01	(P	3.206E-01	1.02E-01	G
		176.29	-1.662E-01	% P	5.867E-01	1.75E-01	G
I-131	2.7647E-02						
		364.48	2.765E-02	%(	5.120E-02	1.56E-02	G K
		636.97	-1.533E-06	%	6.704E-01	1.85E-01	G
		284.29	-4.763E-03	&	8.039E-01	2.34E-01	G
CS-134	-9.2799E-03						
		604.66	-9.280E-03	%(P	4.566E-02	1.32E-02	G K
		795.76	2.368E-02	% P	4.471E-02	1.37E-02	G
		569.29	4.130E-03	& P	3.345E-01	9.61E-02	G
		801.84	6.883E-03	%	3.076E-01	8.08E-02	G
CS-137	1.0365E-02						
		661.62	1.036E-02	&(P	4.914E-02	1.42E-02	G
CE-139	1.0146E-02						
		165.85	1.015E-02	%(P	4.478E-02	1.34E-02	G
EU-152	-3.8842E-02						
		121.78	-3.884E-02	%(P	1.218E-01	3.66E-02	G K
		344.30	-3.755E-02	% P	1.482E-01	4.39E-02	G
		1408.08	1.060E-01	% P	1.834E-01	5.76E-02	G
		964.00	-2.078E-02	% P	3.804E-01	1.06E-01	G
		1112.07	6.495E-02	% P	3.678E-01	1.05E-01	G
		778.90	-7.858E-02	% P	3.794E-01	1.10E-01	G
EU-154	6.1650E-03						
		123.10	6.165E-03	&(P	9.069E-02	2.69E-02	G K
		1274.80	-9.470E-04	% P	1.592E-01	4.35E-02	G
		723.30	-5.484E-02	% P	2.611E-01	7.60E-02	G
		1004.80	1.128E-01	% P	2.575E-01	7.75E-02	G
EU-155	1.0132E-01						
		86.45	1.013E-01	%(	1.513E-01	4.62E-02	G K
		105.31	2.397E-02	%	1.854E-01	5.53E-02	G
HG-203	2.6436E-02						
		279.17	2.644E-02	&(	3.547E-02	1.10E-02	G K
		72.87	-3.894E-01	% P	1.162E+00	3.50E-01	G
		70.83	2.276E-02	%	1.588E+00	4.71E-01	G
		82.50	-5.220E-01	%	2.411E+00	7.23E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	2.5140E-01						
		583.14	2.400E-01	(P	4.382E-02	2.23E-02	G
		510.72	2.951E-01	@(P	2.097E-01	8.12E-02	G
PB-212	5.7276E-01						
		238.63	5.657E-01	(P	8.909E-02	3.56E-02	G K
							Energy duplication
		77.11	6.177E-01	(	3.131E-01	1.01E-01	G
							Energy duplication
		74.81	5.224E-01	&(P	6.387E-01	1.96E-01	G
PB-214	4.1991E-01						
		351.99	4.247E-01	(P	8.897E-02	3.72E-02	G K
		295.22	4.106E-01	(P	1.728E-01	6.05E-02	G
							Energy duplication
		77.11	9.961E-01	+ P	5.132E-01	1.64E-01	G
		241.92	2.382E-02	% P	6.858E-01	2.03E-01	G
BI-212	4.1996E-01						
		727.17	4.200E-01	*(P	3.054E-01	1.16E-01	G K
		1620.56	0.000E+00	%	2.761E+00	7.60E-01	G
		785.42	4.480E-01	% P	2.297E+00	6.63E-01	G
BI-214	4.6228E-01						
		609.32	4.593E-01	(P	9.129E-02	4.55E-02	G K
		1764.51	4.708E-01	(P	1.306E-01	9.21E-02	G
		1120.28	9.788E-01	+ P	3.748E-01	1.80E-01	G
RA-224	8.1034E-01						
		241.00	8.103E-01	%(P	1.138E+00	3.49E-01	G
RA-226	1.6275E+00						
		185.99	1.628E+00	*(	1.049E+00	3.38E-01	G
AC-228	6.2653E-01						
		911.07	6.252E-01	(P	1.123E-01	6.58E-02	G K
		968.90	9.205E-01	+ P	2.660E-01	1.35E-01	G
		338.40	6.298E-01	*(P	3.075E-01	1.21E-01	G
TH-227	-1.7263E-01						
		236.00	-1.726E-01	&(P	4.182E-01	1.26E-01	G K
		256.25	-8.451E-02	% P	5.116E-01	1.51E-01	G
PA-234	9.2417E-02						
		98.44	9.242E-02	%(	1.523E-01	4.65E-02	G K
		946.00	-3.841E-02	%	2.353E-01	6.71E-02	G
		131.28	-3.714E-02	&	1.958E-01	5.86E-02	G
		94.67	-9.847E-02	%	2.919E-01	8.80E-02	G
		883.24	-2.985E-04	%	3.137E-01	8.47E-02	G
		926.70	1.755E-02	&	3.936E-01	1.09E-01	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26 1.048E-02 &   4.933E-01 1.42E-01 G

TH-234       1.0259E+00
                           63.29 1.466E-01 %(P 1.980E+00 5.88E-01 G K
                           92.80 1.558E+00  (P 1.469E+00 4.56E-01 G
                           92.38 1.738E+00 &(P 1.759E+00 5.43E-01 G

AM-241       6.3895E-02
                           59.54 6.390E-02 %(P 2.461E-01 7.38E-02 G
   ( - This peak used in the nuclide activity average.

   * - Peak is too wide, but only one peak in library.
   ! - Peak is part of a multiplet and this area went
       negative during deconvolution.
   ? - Peak is too narrow.
   @ - Peak is too wide at FW25M, but ok at FWHM.
   % - Peak fails sensitivity test.
   $ - Peak identified, but first peak of this nuclide
       failed one or more qualification tests.
   + - Peak activity higher than counting uncertainty range.
   - - Peak activity lower than counting uncertainty range.
   = - Peak outside analysis energy range.
   & - Calculated peak centroid is not close enough to the
       library energy centroid for positive identification.
   P - Peakbackground subtraction
   } - Peak is too close to another for the activity
       to be found directly.

   Nuclide Codes:                      Peak Codes:
   T - Thermal Neutron Activation      G - Gamma Ray
   F - Fast Neutron Activation         X - X-Ray
   I - Fission Product                 P - Positron Decay
   N - Naturally Occurring Isotope     S - Single-Escape
   P - Photon Reaction                 D - Double-Escape
   C - Charged Particle Reaction       K - Key Line
   M - No MDA Calculation              A - Not in Average
   R - Coincidence Corrected           C - Coincidence Peak
   H - Halflife limit exceeded

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
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***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	1.8825E-02	1.9940E-02	3.0054E-01	3.0055E-01	3.316E-01
K-40		1.1149E+01	1.1149E+01	1.5710E+00	1.6926E+00	
MN-54	#A	-7.3159E-03	-7.3882E-03	4.7758E-02	4.7760E-02	4.691E-02
CO-57	#B	1.9680E-03	1.9905E-03	4.0927E-02	4.0927E-02	4.540E-02
CO-60	#B	-1.9025E-04	-1.9056E-04	4.8574E-03	4.8574E-03	3.683E-02

Sr-85	#A	-5.3415E-03	-5.6008E-03	4.4270E-02	4.4271E-02	4.832E-02
Kr-85	#A	-1.4909E+02	-1.4910E+02	1.3751E+03	1.3751E+03	1.121E+03
Y-88	#B	-8.8185E-05	-9.0764E-05	3.9189E-02	3.9189E-02	4.977E-02
NB-94	#B	-2.5248E-04	-2.5248E-04	2.4631E-01	2.4631E-01	3.439E-02
Ag-108M	#B	-1.1068E-02	-1.1069E-02	4.7546E-02	4.7550E-02	5.440E-02
CD-109	#A	-2.4836E-02	-2.5004E-02	1.7557E+00	1.7557E+00	1.355E+00
SN-113	#B	0.0000E+00	0.0000E+00	5.3498E-02	5.3498E-02	6.022E-02
SB-125	#B	6.3630E-02	6.3823E-02	7.2262E-02	7.2352E-02	1.247E-01
I-131	#B	1.8863E-02	2.7647E-02	4.6944E-02	4.6970E-02	3.493E-02
CS-134	#B	-9.2421E-03	-9.2799E-03	4.6116E-02	4.6119E-02	4.547E-02
CS-137	#A	1.0362E-02	1.0365E-02	4.2660E-02	4.2664E-02	4.912E-02
CE-139	#A	9.9217E-03	1.0146E-02	4.0163E-02	4.0167E-02	4.379E-02
EU-152	#B	-3.8816E-02	-3.8842E-02	1.1489E-01	1.1491E-01	1.217E-01
EU-154	#B	6.1589E-03	6.1650E-03	8.0791E-02	8.0791E-02	9.060E-02
EU-155	#B	1.0115E-01	1.0132E-01	1.3875E-01	1.3886E-01	1.511E-01
HG-203	#B	2.4748E-02	2.6436E-02	3.3145E-02	3.3178E-02	3.320E-02
TL-208		2.5140E-01	2.5140E-01	7.0114E-02	7.1538E-02	
PB-212	#	5.7276E-01	5.7276E-01	1.0819E-01	1.1293E-01	8.909E-02
PB-214	#	4.1991E-01	4.1991E-01	1.0791E-01	1.1049E-01	8.897E-02
BI-212	#	4.1996E-01	4.1996E-01	3.4932E-01	3.5012E-01	
BI-214		4.6228E-01	4.6228E-01	1.3740E-01	1.3986E-01	
RA-224	#A	8.1034E-01	8.1034E-01	1.0482E+00	1.0492E+00	1.138E+00
RA-226	#	1.6275E+00	1.6275E+00	1.0135E+00	1.0177E+00	1.049E+00
AC-228		6.2653E-01	6.2653E-01	1.9787E-01	2.0101E-01	
TH-227	#B	-1.7263E-01	-1.7263E-01	3.8661E-01	3.8674E-01	4.182E-01
PA-234	#B	9.2417E-02	9.2417E-02	1.3944E-01	1.3953E-01	1.523E-01
TH-234	#B	1.0259E+00	1.0259E+00	8.9982E-01	9.0162E-01	1.980E+00
AM-241	#A	6.3894E-02	6.3895E-02	2.2132E-01	2.2135E-01	2.461E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (270.6 to 1999.1 keV) 1.2909055E+01 pCi/gm
Total Decayed Activity (270.6 to 1999.1 keV) 1.2909055E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JJM

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 101F_14SEPT2006_1605.An1

Sample description
FSS-OOL-05-08-003-F

Spectrum Filename: C:\GammaVision\Spectra\101F_14SEPT2006_1605.An1

Acquisition information

Start time:	14-Sep-2006 16:05:25
Live time:	2000
Real time:	2002
Dead time:	0.08 %
Detector ID:	1

Detector system
Det 101- DSPE-633

Calibration

Filename:	D1_1LSa.Clb

Detector 101 1.0 Liter Marinelli Sand

Energy Calibration

Created:	03-Sep-2004 08:50:48
Zero offset:	0.244 keV
Gain:	0.500 keV/channel
Quadratic:	-2.493E-08 keV/channel^2

Efficiency Calibration

Created:	03-Sep-2004 08:52:26
Type:	Polynomial
Uncertainty:	0.626 %
Coefficients:	-0.321775 -5.816463 0.734234
	-0.099357 0.006049 -0.000149

Library Files

Main analysis library:	FSS_Rev_1.Lib
Library Match Width:	1.000
Peak stripping:	Library based

Analysis parameters

Analysis engine:	Env32 G53W4.20
Start channel:	100 (50.23keV)
Stop channel:	4000 (1999.11keV)
Peak rejection level:	41.667%
Peak search sensitivity:	3
Sample Size:	1.9580E+03
Activity scaling factor:	1.0000E+06/(1.0000E+00* 1.9580E+03) = 5.1073E+02
Detection limit method:	Nureg 4.16
Random error:	1.0000000E+00
Systematic error:	1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	11-Sep-2006 11:40:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	101_150K_28APR05.Pbc 01-May-2005 05:24:47
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 9 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.0714

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
77.22	133.	25.51	1.50	1.720E-02	77.11	17.500	3.049E-01	PB212
					77.11	10.700	4.847E-01	PB214
77.22	129.	25.51	1.50	1.720E-02	77.11	17.500	PBC<MDA	PB212
					77.11	10.700	4.847E-01	PB214
93.30	66.	31.19	1.02	1.997E-02	92.80	3.000	PBC<MDA	TH234
					94.67	15.500	1.457E-01	PA234
185.92	61.	35.06	1.73	1.859E-02				
185.92	61.	35.06	1.73	1.859E-02	185.99	3.280	6.919E-01	RA226
238.78	332.	8.80	0.94	1.557E-02	238.63	43.100	3.346E-01	PB212
					241.92	7.470	1.985E+00	PB214
295.45	112.	12.19	1.16	1.291E-02	295.22	19.200	3.063E-01	PB214
300.35	38.	28.99	1.16	1.271E-02				
338.47	55.	22.04	0.97	1.135E-02	338.40	12.010	2.674E-01	AC228
352.06	163.	12.83	1.35	1.092E-02	351.99	37.100	2.739E-01	PB214
511.03	59.	19.04	1.44	7.586E-03	510.72	22.500	1.737E-01	TL208
582.98	122.	13.48	1.21	6.686E-03	583.14	86.000	1.441E-01	TL208
609.37	96.	13.98	1.45	6.412E-03	609.32	46.090	2.204E-01	BI214
911.30	68.	15.27	1.30	4.446E-03	911.07	29.000	3.550E-01	AC228
968.95	26.	33.05	1.62	4.212E-03	968.90	17.460	PBC<MDA	AC228
1120.24	40.	30.10	1.08	3.711E-03	1120.28	15.040	4.899E-01	BI214
1460.70	414.	5.09	2.04	2.943E-03	1460.75	10.700	9.030E+00	K40
1764.58	24.	20.41	0.83	2.481E-03	1764.51	15.920	4.117E-01	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide
600.45	300.42	41.	38.	0.019	86.98	1.165	PB-212 lD

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-212	153.79	77.11	509.	133.	0.066	76.54	1.499D
PB-214	153.79	77.11	513.	129.	0.065	76.54	1.499D
PA-234	186.14	93.28	338.	82.	0.041	100.16	1.499s
RA-226	372.12	186.23	232.	61.	0.030	113.49	1.499s
PB-212	477.24	238.77	208.	232.	0.116	31.92	1.499
PB-214	590.81	295.53	55.	95.	0.048	44.04	1.499s
AC-228	676.74	338.48	71.	50.	0.025	78.86	1.499
PB-214	703.94	352.07	64.	155.	0.078	32.06	1.499s
TL-208	1022.00	511.03	44.	43.	0.021	57.12	1.441
TL-208	1165.96	582.98	44.	120.	0.060	40.43	1.209s
BI-214	1218.78	609.37	30.	94.	0.047	41.93	1.449
AC-228	1822.96	911.30	19.	63.	0.031	46.29	1.578s
AC-228	1938.32	968.95	25.	26.	0.013	99.16	1.616s
BI-214	2241.08	1120.24	30.	40.	0.020	90.31	1.084s
K-40	2922.41	1460.70	9.	412.	0.206	15.26	2.038
BI-214	3530.60	1764.58	0.	24.	0.012	61.24	0.833s

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

Nuclide Name	Nuclide Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	Peak MDA Value pCi/gm	COMMENTS
BE-7		1.4111E-01					
			477.56	1.411E-01	%(	2.643E-01 8.10E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
K-40	9.0297E+00						
		1460.75	9.030E+00	(P	3.672E-01	4.62E-01	G
MN-54	-6.0443E-04						
		834.81	-6.044E-04	&(P	5.307E-02	1.49E-02	G
CO-57	-4.3444E-03						
		122.07	-4.344E-03	%(	3.382E-02	1.00E-02	G K
		136.43	-7.451E-03	&	2.764E-01	8.14E-02	G
CO-60	1.1671E-02						
		1332.51	1.167E-02	&(P	4.284E-02	1.23E-02	G K
		1173.23	1.590E-02	& P	4.531E-02	1.33E-02	G K
Sr-85	-9.8639E-03						
		514.00	-9.864E-03	%(	3.924E-02	1.15E-02	G
Kr-85	-2.4514E+02						
		513.99	-2.451E+02	%(P	8.826E+02	2.57E+02	G
Y-88	0.0000E+00						
		1836.01	0.000E+00	%(	2.185E-02	2.97E-03	G K
		898.02	-3.688E-03	& P	4.634E-02	1.29E-02	G
NB-94	8.5154E-03						
		871.10	8.515E-03	%(P	3.005E-02	8.64E-03	G K
		702.50	1.809E-05	% P	3.122E-02	8.46E-03	G K
Ag-108M	-6.8547E-03						
		722.95	-6.855E-03	%(	4.056E-02	1.16E-02	G K
		614.37	-6.203E-03	% P	3.861E-02	1.11E-02	G
		433.93	6.017E-03	&	2.405E-02	6.97E-03	G
CD-109	-4.4760E-02						
		88.04	-4.476E-02	%(P	1.026E+00	3.04E-01	G
SN-113	1.2100E-02						
		391.71	1.210E-02	%(	3.903E-02	1.15E-02	G K
		255.04	9.849E-02	% P	1.245E+00	3.62E-01	G
SB-125	6.3602E-03						
		427.95	6.360E-03	%(P	8.239E-02	2.32E-02	G K
		600.77	-1.300E-03	& P	1.483E-01	4.01E-02	G
		636.15	1.025E-01	% P	2.535E-01	7.56E-02	G
		463.51	3.676E-02	% P	2.679E-01	7.58E-02	G
		176.29	1.144E-01	% P	4.387E-01	1.31E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
I-131	1.1702E-02						
		364.48	1.170E-02	%(	4.076E-02	1.20E-02	G K
		636.97	2.021E-01	%	5.269E-01	1.57E-01	G
		284.29	-2.423E-02	%	6.127E-01	1.77E-01	G
CS-134	3.6385E-03						
		604.66	3.639E-03	%(P	2.016E-02	5.52E-03	G K
		795.76	5.126E-03	% P	4.194E-02	1.17E-02	G
		569.29	6.355E-02	& P	2.081E-01	6.11E-02	G
		801.84	3.524E-02	&	3.478E-01	9.55E-02	G
CS-137	1.5178E-02						
		661.62	1.518E-02	%(P	4.091E-02	1.21E-02	G
CE-139	-7.2582E-03						
		165.85	-7.258E-03	%(P	3.519E-02	1.05E-02	G
EU-152	1.8841E-03						
		121.78	1.884E-03	%(P	9.397E-02	2.76E-02	G K
		344.30	3.587E-02	% P	9.403E-02	2.81E-02	G
		1408.08	-1.904E-03	& P	1.605E-01	3.94E-02	G
		964.00	-7.784E-02	% P	3.517E-01	1.01E-01	G
		1112.07	-1.477E-03	& P	4.761E-01	1.33E-01	G
		778.90	3.350E-02	% P	2.531E-01	7.07E-02	G
EU-154	-1.4548E-03						
		123.10	-1.455E-03	%(P	5.273E-02	1.53E-02	G K
		1274.80	-9.351E-03	& P	1.331E-01	3.63E-02	G
		723.30	-2.331E-03	% P	2.690E-01	7.62E-02	G
		1004.80	-2.793E-02	% P	2.295E-01	6.37E-02	G
EU-155	5.7305E-02						
		86.45	5.731E-02	&(	1.081E-01	3.29E-02	G K
		105.31	1.903E-02	%	1.487E-01	4.42E-02	G
HG-203	0.0000E+00						
		279.17	0.000E+00	&(	3.317E-02	9.53E-03	G K
		72.87	2.940E-01	% P	5.606E-01	1.70E-01	G
		70.83	-3.348E-01	&	1.516E+00	4.54E-01	G
		82.50	-3.975E-01	%	1.813E+00	5.42E-01	G
TL-208	1.5023E-01						
		583.14	1.441E-01	*(P	4.035E-02	1.98E-02	G
		510.72	1.737E-01	(P	1.359E-01	4.54E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
PB-212	2.5755E-01						
		238.63	2.383E-01	(P	7.184E-02	2.60E-02	G K
							Energy duplication
		77.11	3.049E-01	(	2.472E-01	7.78E-02	G
		74.81	3.121E-01	& P	4.870E-01	1.49E-01	G
PB-214	2.6446E-01						
		351.99	2.643E-01	*(P	6.832E-02	2.86E-02	G K
		295.22	2.647E-01	(P	1.033E-01	3.96E-02	G
							Energy duplication
		77.11	4.847E-01	+ P	4.058E-01	1.27E-01	G
		241.92	5.078E-02	% P	4.727E-01	1.40E-01	G
BI-212	1.7836E-01						
		727.17	1.784E-01	%(P	2.471E-01	7.88E-02	G K
		1620.56	2.200E-01	%	1.023E+00	2.74E-01	G
		785.42	-1.632E-02	% P	2.092E+00	5.77E-01	G
BI-214	2.2042E-01						
		609.32	2.204E-01	(P	6.554E-02	3.12E-02	G K
		1764.51	4.117E-01	+ P	1.288E-01	8.56E-02	G
		1120.28	4.899E-01	+ P	3.511E-01	1.49E-01	G
RA-224	3.9864E-01						
		241.00	3.986E-01	%(P	8.841E-01	2.67E-01	G
RA-226	6.8610E-01						
		185.99	6.861E-01	(	8.351E-01	2.60E-01	G
AC-228	3.1145E-01						
		911.07	3.352E-01	*(P	1.236E-01	5.33E-02	G K
		968.90	2.405E-01	- P	2.460E-01	8.17E-02	G
		338.40	2.542E-01	(P	2.123E-01	6.97E-02	G
TH-227	-1.1748E-01						
		236.00	-1.175E-01	%(P	2.906E-01	8.75E-02	G K
		256.25	-9.226E-02	% P	4.145E-01	1.22E-01	G
PA-234	4.9526E-02						
		98.44	-3.280E-02	%(	1.371E-01	4.10E-02	G K
		946.00	0.000E+00	%	2.254E-01	6.18E-02	G
		131.28	2.417E-02	%	1.509E-01	4.49E-02	G
		94.67	1.828E-01	&(	1.959E-01	6.10E-02	G
		883.24	-1.631E-02	%	3.261E-01	8.98E-02	G
		926.70	7.002E-02	%	3.262E-01	9.28E-02	G
		569.26	9.771E-02	&	3.063E-01	9.04E-02	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments

TH-234       7.4160E-01
                           63.29 7.416E-01 %(P 1.521E+00 4.59E-01 G K
                           92.80 8.312E-01 % P 1.157E+00 3.54E-01 G
                           92.38-1.357E-01 & P 1.350E+00 3.94E-01 G

AM-241       2.5620E-02
                           59.54 2.562E-02 %(P 1.971E-01 5.84E-02 G
   ( - This peak used in the nuclide activity average.

   * - Peak is too wide, but only one peak in library.
   ! - Peak is part of a multiplet and this area went
       negative during deconvolution.
   ? - Peak is too narrow.
   @ - Peak is too wide at FW25M, but ok at FWHM.
   % - Peak fails sensitivity test.
   $ - Peak identified, but first peak of this nuclide
       failed one or more qualification tests.
   + - Peak activity higher than counting uncertainty range.
   - - Peak activity lower than counting uncertainty range.
   = - Peak outside analysis energy range.
   & - Calculated peak centroid is not close enough to the
       library energy centroid for positive identification.
   P - Peakbackground subtraction
   } - Peak is too close to another for the activity
       to be found directly.

   Nuclide Codes:                      Peak Codes:
   T - Thermal Neutron Activation      G - Gamma Ray
   F - Fast Neutron Activation         X - X-Ray
   I - Fission Product                 P - Positron Decay
   N - Naturally Occurring Isotope     S - Single-Escape
   P - Photon Reaction                 D - Double-Escape
   C - Charged Particle Reaction       K - Key Line
   M - No MDA Calculation              A - Not in Average
   R - Coincidence Corrected           C - Coincidence Peak
   H - Halflife limit exceeded

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
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***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	1.3539E-01	1.4111E-01	2.4307E-01	2.4320E-01	2.536E-01
K-40		9.0297E+00	9.0297E+00	1.3859E+00	1.4768E+00	
MN-54	#A	-6.0017E-04	-6.0443E-04	3.7238E-02	3.7238E-02	5.269E-02
CO-57	#B	-4.3090E-03	-4.3444E-03	3.0094E-02	3.0095E-02	3.355E-02
CO-60	#B	1.1657E-02	1.1671E-02	3.6830E-02	3.6836E-02	4.279E-02
Sr-85	#A	-9.5338E-03	-9.8639E-03	3.4616E-02	3.4621E-02	3.792E-02

Kr-85	#A	-2.4514E+02	-2.4514E+02	9.4809E+02	9.4820E+02	8.826E+02
Y-88	#B	0.0000E+00	0.0000E+00	8.8960E-03	8.8975E-03	2.141E-02
NB-94	#B	8.5154E-03	8.5154E-03	2.5931E-02	2.5936E-02	3.005E-02
Ag-108M	#B	-6.8543E-03	-6.8547E-03	3.4747E-02	3.4749E-02	4.056E-02
CD-109	#A	-4.4543E-02	-4.4760E-02	1.1125E+00	1.1125E+00	1.021E+00
SN-113	#B	1.1871E-02	1.2100E-02	3.4590E-02	3.4597E-02	3.829E-02
SB-125	#B	6.3464E-03	6.3602E-03	6.9554E-02	6.9555E-02	8.221E-02
I-131	#B	8.8927E-03	1.1702E-02	3.6081E-02	3.6087E-02	3.098E-02
CS-134	#B	3.6279E-03	3.6385E-03	1.6554E-02	1.6556E-02	2.010E-02
CS-137	#A	1.5175E-02	1.5178E-02	3.6315E-02	3.6325E-02	4.090E-02
CE-139	#A	-7.1426E-03	-7.2582E-03	3.2664E-02	3.2666E-02	3.463E-02
EU-152	#B	1.8832E-03	1.8841E-03	8.2858E-02	8.2858E-02	9.392E-02
EU-154	#B	-1.4538E-03	-1.4548E-03	1.4025E-01	1.4025E-01	5.269E-02
EU-155	#B	5.7236E-02	5.7305E-02	9.8599E-02	9.8650E-02	1.079E-01
HG-203	#B	0.0000E+00	0.0000E+00	2.8588E-02	2.8588E-02	3.163E-02
TL-208		1.5023E-01	1.5023E-01	6.1947E-02	6.2526E-02	
PB-212	#	2.5755E-01	2.5755E-01	8.4393E-02	8.5639E-02	7.184E-02
PB-214	#	2.6446E-01	2.6446E-01	7.3225E-02	7.4734E-02	6.832E-02
BI-212	#B	1.7836E-01	1.7836E-01	2.3648E-01	2.3670E-01	2.471E-01
BI-214		2.2042E-01	2.2042E-01	9.3503E-02	9.4328E-02	
RA-224	#A	3.9864E-01	3.9864E-01	8.0212E-01	8.0244E-01	8.841E-01
RA-226	#A	6.8610E-01	6.8610E-01	7.7863E-01	7.7960E-01	8.351E-01
AC-228	#	3.1145E-01	3.1145E-01	1.4810E-01	1.4914E-01	1.236E-01
TH-227	#B	-1.1748E-01	-1.1748E-01	2.7033E-01	2.7041E-01	2.906E-01
PA-234	#B	4.9526E-02	4.9526E-02	4.9604E-02	4.9680E-02	1.371E-01
TH-234	#B	7.4160E-01	7.4160E-01	1.3774E+00	1.3780E+00	1.521E+00
AM-241	#A	2.5619E-02	2.5620E-02	1.7533E-01	1.7534E-01	1.971E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (50.2 to 1999.1 keV) 9.4003592E+00 pCi/gm
Total Decayed Activity (50.2 to 1999.1 keV) 9.4003592E+00 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JPK

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 101F_14SEPT2006_1645.An1

Sample description
FSS-OOL-05-08-020-F

Spectrum Filename: C:\GammaVision\Spectra\101F_14SEPT2006_1645.An1

Acquisition information
Start time: 14-Sep-2006 16:45:50
Live time: 2000
Real time: 2002
Dead time: 0.10 %
Detector ID: 1

Detector system
Det 101- DSPE-633

Calibration
Filename: D1_1LSa.Clb
Detector 101 1.0 Liter Marinelli Sand

Energy Calibration
Created: 03-Sep-2004 08:50:48
Zero offset: 0.244 keV
Gain: 0.500 keV/channel
Quadratic: -2.493E-08 keV/channel^2

Efficiency Calibration
Created: 03-Sep-2004 08:52:26
Type: Polynomial
Uncertainty: 0.626 %
Coefficients: -0.321775 -5.816463 0.734234
-0.099357 0.006049 -0.000149

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.23keV)
Stop channel: 4000 (1999.11keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 1.6780E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.6780E+03) =
5.9595E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	11-Sep-2006 13:24:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	101_150K_28APR05.Pbc 01-May-2005 05:24:47
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 13 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.1846

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
73.95	86.	35.36	1.00	1.634E-02	70.83	3.520	1.360E+00	HG203
					74.81	9.600	PBC<MDA	PB212
77.16	314.	9.66	1.01	1.728E-02	77.11	10.700	1.358E+00	PB214
					77.11	17.500	8.403E-01	PB212
86.94	111.	37.23	1.50	1.910E-02	82.50	2.240	2.280E+00	HG203
					86.45	32.740	1.438E-01	EU155
89.76	118.	21.02	1.02	1.957E-02	88.04	3.790	PBC<MDA	CD109
93.39	115.	22.45	1.02	1.997E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
185.85	146.	21.15	1.38	1.859E-02	185.99	3.280	1.936E+00	RA226
209.34	93.	27.66	1.52	1.721E-02				
238.81	662.	4.67	1.12	1.557E-02	238.63	43.100	7.870E-01	PB212
241.74	103.	22.21	1.12	1.541E-02	241.00	3.900	PBC<MDA	RA224
					241.92	7.470	PBC<MDA	PB214
270.23	57.	31.72	1.14	1.400E-02				
295.27	168.	12.81	1.15	1.292E-02	295.22	19.200	5.383E-01	PB214
300.35	58.	30.75	0.68	1.271E-02				
328.32	54.	38.69	1.47	1.169E-02				
338.47	160.	14.04	1.25	1.135E-02	338.40	12.010	9.300E-01	AC228
352.05	288.	10.32	1.03	1.092E-02	351.99	37.100	5.683E-01	PB214
463.11	42.	31.50	1.02	8.349E-03				
463.11	42.	31.50	1.02	8.349E-03	463.51	10.000	3.904E-01	SB125
510.94	98.	18.18	2.17	7.587E-03	510.72	22.500	3.856E-01	TL208
583.35	190.	9.11	1.55	6.682E-03	583.14	86.000	2.621E-01	TL208
609.37	216.	10.82	1.37	6.412E-03	609.32	46.090	5.853E-01	BI214
767.90	27.	36.74	1.36	5.180E-03				
794.93	22.	40.66	1.50	5.016E-03	795.76	85.400	PBC<MDA	CS134

911.25	147.	12.44	1.80	4.446E-03	911.07	29.000	9.064E-01	AC228
965.38	22.	40.94	1.61	4.226E-03				
968.97	76.	13.95	1.62	4.212E-03	968.90	17.460	8.290E-01	AC228
1119.97	71.	20.11	1.43	3.712E-03	1120.28	15.040	1.013E+00	BI214
1460.74	686.	3.82	1.79	2.942E-03	1460.75	10.700	1.749E+01	K40
1764.02	27.	19.25	1.67	2.481E-03	1764.51	15.920	5.415E-01	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide
179.09	89.91	250.	118.	0.059	63.07	1.016	PB-214 lD
418.36	209.34	250.	93.	0.047	82.98	1.524	AC-228 s
477.33	238.72	147.	662.	0.331	14.00	1.122	PB-212 D
483.18	241.65	208.	103.	0.051	66.63	1.124	PB-214 D
540.18	270.23	135.	57.	0.029	95.17	1.142	AC-228
600.45	300.35	116.	58.	0.029	92.24	0.683	PB-212 s
656.41	328.32	144.	54.	0.027	116.07	1.465	RH-106M s
1536.00	767.90	34.	27.	0.014	110.21	1.359	BI-214
1931.28	965.38	30.	22.	0.011	124.47	1.613	AC-228 D

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-212	148.88	74.65	875.	156.	0.078	81.21	1.499
PB-214	153.79	77.11	837.	254.	0.127	50.99	1.499D
PB-212	153.79	77.11	833.	258.	0.129	50.99	1.499D
HG-203	171.21	85.82	764.	-101.	-0.050	120.05	1.499s
EU-155	173.47	86.94	806.	111.	0.056	111.70	1.499
TH-234	185.83	93.12	725.	123.	0.061	88.60	1.499s
TH-234	185.81	93.11	687.	131.	0.065	84.97	1.499s
RA-226	371.36	185.85	326.	146.	0.073	63.46	1.384s
PB-212	477.24	238.77	406.	540.	0.270	20.15	1.499
PB-214	590.50	295.38	156.	150.	0.075	42.42	1.499
AC-228	676.72	338.47	125.	157.	0.079	42.13	1.254
PB-214	704.04	352.12	127.	243.	0.122	27.24	1.499
SB-125	925.90	463.00	57.	41.	0.021	87.30	1.499
TL-208	1021.82	510.94	84.	82.	0.041	54.53	2.167s
TL-208	1166.70	583.35	46.	187.	0.094	27.34	1.549
BI-214	1218.78	609.37	90.	215.	0.107	32.46	1.375s
CS-134	1590.08	794.93	31.	22.	0.011	121.99	1.502
AC-228	1822.85	911.25	54.	145.	0.073	37.31	1.802s
AC-228	1938.21	968.90	19.	76.	0.038	41.85	1.616D
BI-214	2240.53	1119.97	37.	70.	0.035	60.34	1.426
K-40	2922.50	1460.74	2.	684.	0.342	11.45	1.788

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
BI-214	3529.47	1764.02	0.	27.	0.013	57.74	1.666

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	Peak MDA Value pCi/gm	Peak	COMMENTS
BE-7		2.1289E-01						
			477.56	2.129E-01	%(	4.128E-01	1.26E-01	G
K-40		1.7489E+01						
			1460.75	1.749E+01	(P	2.493E-01	6.70E-01	G
MN-54		3.0283E-02						
			834.81	3.028E-02	%(P	4.246E-02	1.35E-02	G
CO-57		-8.2056E-03						
			122.07	-8.206E-03	&(	5.466E-02	1.63E-02	G K
			136.43	-1.557E-02	&	4.446E-01	1.32E-01	G
CO-60		3.7212E-04						
			1332.51	3.721E-04	&(P	6.808E-02	1.86E-02	G K
			1173.23	3.095E-02	% P	7.975E-02	2.38E-02	G K
Sr-85		-1.6715E-02						
			514.00	-1.672E-02	%(	5.905E-02	1.75E-02	G
Kr-85		-4.0351E+02						
			513.99	-4.035E+02	%(P	1.325E+03	3.92E+02	G
Y-88		-3.6812E-03						
			1836.01	-3.681E-03	%(	4.088E-02	1.02E-02	G K
			898.02	5.982E-03	% P	4.736E-02	1.32E-02	G
NB-94		1.6860E-03						
			871.10	1.686E-03	%(P	6.393E-02	1.80E-02	G K
			702.50	5.055E-03	% P	5.266E-02	1.50E-02	G K
Ag-108M		-7.2805E-03						
			722.95	-7.281E-03	%(	5.830E-02	1.67E-02	G K
			614.37	-1.107E-02	% P	5.775E-02	1.68E-02	G
			433.93	0.000E+00	%	5.292E-02	1.52E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CD-109	-5.2214E-01						
		88.04	-5.221E-01	&(P	1.641E+00	4.94E-01	G
SN-113	-1.1712E-02						
		391.71	-1.171E-02	&(	7.307E-02	2.15E-02	G K
		255.04	5.352E-01	% P	2.065E+00	6.16E-01	G
SB-125	1.1078E-01						
		427.95	1.418E-02	&(P	1.449E-01	4.20E-02	G K
		600.77	6.890E-02	& P	2.216E-01	6.53E-02	G
		636.15	-6.758E-03	& P	4.158E-01	1.16E-01	G
		463.51	3.967E-01	(P	3.652E-01	1.20E-01	G
		176.29	1.487E-01	% P	6.953E-01	2.08E-01	G
I-131	-1.1508E-02						
		364.48	-1.151E-02	&(	7.461E-02	2.20E-02	G K
		636.97	1.619E-01	&	8.031E-01	2.33E-01	G
		284.29	2.401E-01	%	8.307E-01	2.48E-01	G
CS-134	1.8093E-02						
		604.66	-2.527E-03	%(P	6.239E-02	1.79E-02	G K
		795.76	4.166E-02	(P	5.408E-02	1.73E-02	G
		569.29	-7.154E-02	% P	3.057E-01	8.91E-02	G
		801.84	5.980E-02	%	5.334E-01	1.50E-01	G
CS-137	3.0910E-02						
		661.62	3.091E-02	%(P	5.837E-02	1.78E-02	G
CE-139	1.2916E-02						
		165.85	1.292E-02	%(P	5.051E-02	1.51E-02	G
EU-152	-2.8265E-02						
		121.78	-2.826E-02	&(P	1.592E-01	4.76E-02	G K
		344.30	-2.988E-02	% P	1.520E-01	4.47E-02	G
		1408.08	9.608E-02	% P	2.095E-01	6.34E-02	G
		964.00	-5.701E-02	% P	4.818E-01	1.37E-01	G
		1112.07	2.177E-01	% P	3.498E-01	1.10E-01	G
		778.90	-1.410E-02	& P	4.401E-01	1.24E-01	G
EU-154	5.9925E-03						
		123.10	5.993E-03	%(P	1.136E-01	3.38E-02	G K
		1274.80	3.640E-02	& P	1.913E-01	5.47E-02	G
		723.30	-3.452E-02	% P	2.638E-01	7.52E-02	G
		1004.80	-3.713E-02	% P	3.434E-01	9.70E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
EU-155	1.4380E-01						
		86.45	1.438E-01	(	1.741E-01	5.35E-02	G K
		105.31	4.381E-02	%	2.116E-01	6.34E-02	G
HG-203	-1.4634E-02						
		279.17	-1.463E-02	%(	5.863E-02	1.75E-02	G K
		72.87	-5.902E-01	& P	1.357E+00	4.10E-01	G
		70.83	-1.210E+00	%	2.286E+00	6.95E-01	G
		82.50	-2.062E+00	+	2.688E+00	8.25E-01	G
TL-208	2.6214E-01						
		583.14	2.621E-01	(P	4.801E-02	2.42E-02	G
		510.72	3.856E-01	+ P	2.144E-01	8.38E-02	G
PB-212	6.7818E-01						
		238.63	6.482E-01	(P	1.159E-01	4.40E-02	G K
							Energy duplication
		77.11	6.905E-01	(	3.671E-01	1.17E-01	G
		74.81	7.903E-01	&(P	7.130E-01	2.21E-01	G
PB-214	4.8423E-01						
		351.99	4.832E-01	(P	1.098E-01	4.42E-02	G K
		295.22	4.862E-01	(P	1.975E-01	6.96E-02	G
							Energy duplication
		77.11	1.113E+00	+ P	6.017E-01	1.92E-01	G
		241.92	-2.742E-03	% P	8.476E-01	2.51E-01	G
BI-212	3.0301E-01						
		727.17	3.030E-01	%(P	4.546E-01	1.41E-01	G K
		1620.56	3.019E-01	%	1.368E+00	3.73E-01	G
		785.42	7.598E-01	% P	2.311E+00	6.81E-01	G
BI-214	5.7403E-01						
		609.32	5.853E-01	@(P	1.280E-01	6.36E-02	G K
		1764.51	5.415E-01	(P	1.502E-01	1.06E-01	G
		1120.28	1.013E+00	+ P	4.469E-01	2.05E-01	G
RA-224	9.3015E-01						
		241.00	9.301E-01	%(P	1.437E+00	4.39E-01	G
RA-226	1.9357E+00						
		185.99	1.936E+00	@(	1.147E+00	4.09E-01	G
AC-228	8.8809E-01						
		911.07	9.064E-01	*(P	2.305E-01	1.14E-01	G K
		968.90	8.288E-01	(P	2.539E-01	1.17E-01	G
		338.40	9.300E-01	(P	3.233E-01	1.32E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TH-227	-1.6322E-01						
		236.00	-1.632E-01	%(P	5.133E-01	1.54E-01	G K
		256.25	1.537E-01	% P	5.963E-01	1.78E-01	G
PA-234	5.2435E-03						
		98.44	5.243E-03	&(	1.841E-01	5.47E-02	G K
		946.00	0.000E+00	%	4.681E-01	1.34E-01	G
		131.28	-1.860E-02	%	2.294E-01	6.83E-02	G
		94.67	-1.490E-01	%	3.275E-01	9.92E-02	G
		883.24	-2.070E-03	%	4.283E-01	1.18E-01	G
		926.70	1.854E-01	%	4.634E-01	1.39E-01	G
		569.26	-1.270E-02	%	4.298E-01	1.22E-01	G
TH-234	1.2377E+00						
		63.29	3.711E-01	%(P	2.371E+00	7.07E-01	G K
		92.80	1.761E+00	(P	1.685E+00	5.22E-01	G
		92.38	1.942E+00	&(P	2.024E+00	6.24E-01	G
AM-241	3.0924E-02						
		59.54	3.092E-02	%(P	3.290E-01	9.81E-02	G

(- This peak used in the nuclide activity average.

* - Peak is too wide, but only one peak in library.
! - Peak is part of a multiplet and this area went negative during deconvolution.
? - Peak is too narrow.
@ - Peak is too wide at FW25M, but ok at FWHM.
% - Peak fails sensitivity test.
$ - Peak identified, but first peak of this nuclide failed one or more qualification tests.
\+ - Peak activity higher than counting uncertainty range.
\- - Peak activity lower than counting uncertainty range.
= - Peak outside analysis energy range.
& - Calculated peak centroid is not close enough to the library energy centroid for positive identification.
P - Peakbackground subtraction
} - Peak is too close to another for the activity to be found directly.

Nuclide Codes:	Peak Codes:
T - Thermal Neutron Activation	G - Gamma Ray
F - Fast Neutron Activation	X - X-Ray
I - Fission Product	P - Positron Decay
N - Naturally Occurring Isotope	S - Single-Escape
P - Photon Reaction	D - Double-Escape
C - Charged Particle Reaction	K - Key Line
M - No MDA Calculation	A - Not in Average

R - Coincidence Corrected C - Coincidence Peak
H - Halflife limit exceeded

- -

***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	2.0439E-01	2.1289E-01	3.7750E-01	3.7769E-01	3.963E-01
K-40		1.7489E+01	1.7489E+01	2.0099E+00	2.2396E+00	
MN-54	#A	3.0073E-02	3.0283E-02	4.0486E-02	4.0522E-02	4.217E-02
CO-57	#B	-8.1398E-03	-8.2056E-03	4.8998E-02	4.9000E-02	5.422E-02
CO-60	#B	3.7170E-04	3.7212E-04	5.5781E-02	5.5781E-02	6.801E-02
Sr-85	#A	-1.6163E-02	-1.6715E-02	5.2631E-02	5.2640E-02	5.710E-02
Kr-85	#A	-4.0350E+02	-4.0351E+02	1.3586E+03	1.3588E+03	1.325E+03
Y-88	#B	-3.6068E-03	-3.6812E-03	3.0613E-02	3.0614E-02	4.005E-02
NB-94	#B	1.6860E-03	1.6860E-03	5.4119E-02	5.4119E-02	6.393E-02
Ag-108M	#B	-7.2802E-03	-7.2805E-03	5.0136E-02	5.0138E-02	5.829E-02
CD-109	#A	-5.1964E-01	-5.2214E-01	1.5132E+00	1.5135E+00	1.633E+00
SN-113	#B	-1.1492E-02	-1.1712E-02	6.4393E-02	6.4397E-02	7.170E-02
SB-125	#B	1.1055E-01	1.1078E-01	1.0012E-01	1.0032E-01	1.446E-01
I-131	#B	-8.7789E-03	-1.1508E-02	6.5865E-02	6.5868E-02	5.691E-02
CS-134	#B	1.8040E-02	1.8093E-02	2.2488E-02	2.2511E-02	6.221E-02
CS-137	#A	3.0904E-02	3.0910E-02	5.3336E-02	5.3365E-02	5.836E-02
CE-139	#A	1.2713E-02	1.2916E-02	4.5364E-02	4.5370E-02	4.971E-02
EU-152	#B	-2.8252E-02	-2.8265E-02	1.5344E-01	1.5345E-01	1.591E-01
EU-154	#B	5.9883E-03	5.9925E-03	1.0134E-01	1.0134E-01	1.135E-01
EU-155	#A	1.4362E-01	1.4380E-01	1.6062E-01	1.6082E-01	1.739E-01
HG-203	#B	-1.3966E-02	-1.4634E-02	5.2466E-02	5.2473E-02	5.596E-02
TL-208		2.6214E-01	2.6214E-01	7.2581E-02	7.4077E-02	
PB-212	#	6.7818E-01	6.7818E-01	1.3818E-01	1.4340E-01	1.159E-01
PB-214	#	4.8423E-01	4.8423E-01	1.2337E-01	1.2637E-01	1.098E-01
BI-212	#B	3.0301E-01	3.0301E-01	4.2415E-01	4.2449E-01	4.546E-01
BI-214		5.7403E-01	5.7403E-01	1.8727E-01	1.9006E-01	
RA-224	#A	9.3015E-01	9.3015E-01	1.3177E+00	1.3188E+00	1.437E+00
RA-226	#	1.9357E+00	1.9357E+00	1.2283E+00	1.2332E+00	
AC-228		8.8809E-01	8.8809E-01	2.1010E-01	2.1601E-01	
TH-227	#B	-1.6322E-01	-1.6322E-01	4.7459E-01	4.7468E-01	5.133E-01
PA-234	#B	5.2435E-03	5.2435E-03	1.6398E-01	1.6398E-01	1.841E-01
TH-234	#B	1.2377E+00	1.2377E+00	1.1014E+00	1.1036E+00	2.371E+00
AM-241	#A	3.0924E-02	3.0924E-02	2.9423E-01	2.9423E-01	3.290E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.

H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (1120.2 to 1999.1 keV) 2.1148733E+01 pCi/gm
Total Decayed Activity (1120.2 to 1999.1 keV) 2.1148741E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JPK

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 102_11SEPT2006_1535.An1

Sample description
OOL-05-08-009-F-S WET

Spectrum Filename: C:\GammaVision\Spectra\102_11SEPT2006_1535.An1

Acquisition information
Start time: 11-Sep-2006 15:35:54
Live time: 2000
Real time: 2016
Dead time: 0.78 %
Detector ID: 3

Detector system
Det 102 - DSPP-468

Calibration
Filename: D2_1LSa.Clb
DET 102 1 Liter Sand Geometry

Energy Calibration
Created: 15-Jan-2005 03:09:29
Zero offset: 0.220 keV
Gain: 0.500 keV/channel
Quadratic: -6.435E-08 keV/channel^2

Efficiency Calibration
Created: 15-Jan-2005 06:48:10
Type: Polynomial
Uncertainty: 0.497 %
Coefficients: -0.294180 -5.980622 0.744607
-0.096737 0.005214 -0.000120

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.22keV)
Stop channel: 4000 (1999.02keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 1.7370E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.7370E+03) =
5.7571E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	11-Sep-2006 12:55:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	102_150K_28APR05.Pbc 01-May-2005 05:27:47
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 10 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.5951

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
77.15	136.	26.49	1.50	9.541E-03	77.11	10.700	1.037E+00	PB214
					77.11	17.500	6.339E-01	PB212
77.15	136.	26.49	1.50	9.541E-03	77.11	10.700	1.037E+00	PB214
					77.11	17.500	6.339E-01	PB212
93.22	84.	37.95	1.50	1.368E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	1.633E+00	TH234
					94.67	15.500	3.080E-01	PA234
93.22	96.	36.44	1.50	1.333E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	1.864E+00	TH234
					94.67	15.500	3.516E-01	PA234
186.83	94.	28.57	1.51	1.623E-02	185.99	3.280	1.307E+00	RA226
209.48	54.	35.12	0.98	1.518E-02				
239.07	460.	8.37	1.31	1.378E-02	238.63	43.100	6.010E-01	PB212
295.46	87.	24.79	1.32	1.146E-02	295.22	19.200	3.075E-01	PB214
339.17	109.	18.96	1.05	1.004E-02	338.40	12.010	7.025E-01	AC228
352.21	187.	11.58	1.24	9.673E-03	351.99	37.100	4.043E-01	PB214
463.40	29.	34.82	1.50	7.365E-03	463.51	10.000	PBC<MDA	SB125
511.18	68.	22.58	1.60	6.689E-03	510.72	22.500	3.522E-01	TL208
583.74	146.	11.30	1.41	5.884E-03	583.14	86.000	2.236E-01	TL208
610.08	134.	10.68	1.66	5.643E-03	609.32	46.090	3.998E-01	BI214
662.48	25.	34.90	1.51	5.229E-03	661.62	84.620	PBC<MDA	CS137
912.47	54.	19.33	1.65	3.917E-03	911.07	29.000	3.651E-01	AC228
969.68	73.	17.68	1.85	3.715E-03	968.90	17.460	8.745E-01	AC228
1121.74	48.	23.94	2.24	3.283E-03	1120.28	15.040	7.563E-01	BI214
1462.64	374.	5.23	1.90	2.618E-03	1460.75	10.700	1.036E+01	K40

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide
418.58	209.48	148.	54.	0.027	105.36	0.984	AC-228

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-214	153.80	77.11	581.	136.	0.068	79.47	1.500D
PB-212	153.80	77.11	581.	136.	0.068	79.47	1.500D
TH-234	186.02	93.22	562.	96.	0.048	109.33	1.500s
PA-234	186.02	93.22	466.	84.	0.042	113.84	1.500s
RA-226	372.12	186.26	262.	64.	0.032	105.32	1.500s
PB-212	477.67	239.02	200.	354.	0.177	23.29	1.500
PB-214	590.87	295.61	128.	79.	0.040	69.36	1.500
AC-228	678.02	339.17	103.	109.	0.055	56.89	1.047s
PB-214	704.55	352.44	64.	167.	0.083	30.75	1.500
SB-125	926.55	463.40	43.	29.	0.015	104.45	1.500s
TL-208	1022.14	511.18	53.	68.	0.034	67.74	1.604s
TL-208	1167.30	583.74	42.	146.	0.073	33.89	1.412
BI-214	1220.01	610.08	25.	134.	0.067	32.05	1.656
CS-137	1324.85	662.48	26.	25.	0.013	104.69	1.509s
AC-228	1824.54	912.20	48.	66.	0.033	75.04	1.664
AC-228	1939.57	969.68	26.	73.	0.036	53.04	1.849
BI-214	2243.88	1121.74	21.	48.	0.024	71.81	2.242s
K-40	2926.20	1462.64	3.	373.	0.187	15.70	1.903

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	MDA Value pCi/gm	COMMENTS
BE-7		1.3804E-01					
			477.56	1.380E-01	%(	3.059E-01 9.24E-02	G
K-40		1.0358E+01					
			1460.75	1.036E+01	(P	2.857E-01 5.43E-01	G
MN-54		-3.9208E-04					
			834.81	-3.921E-04	&(P	5.317E-02 1.46E-02	G
CO-57		1.4372E-03					
			122.07	1.437E-03	%(	4.890E-02 1.44E-02	G K
			136.43	4.550E-02	&	3.776E-01 1.12E-01	G
CO-60		4.4829E-03					
			1332.51	4.483E-03	%(P	5.608E-02 1.52E-02	G K
			1173.23	4.786E-03	&	6.666E-02 1.85E-02	G K
Sr-85		-1.6663E-02					
			514.00	-1.666E-02	&(	5.099E-02 1.52E-02	G
Kr-85		-3.8422E+02					
			513.99	-3.842E+02	&(	1.176E+03 3.50E+02	G
Y-88		-5.5418E-03					
			1836.01	-5.542E-03	%(P	5.176E-02 1.35E-02	G K
			898.02	-5.483E-04	% P	4.815E-02 1.27E-02	G
NB-94		-9.1798E-05					
			871.10	-9.180E-05	&(	4.362E-02 1.17E-02	G K
			702.50	0.000E+00	&	5.246E-02 1.46E-02	G K
Ag-108M		-1.7366E-04					
			722.95	-1.737E-04	%(	3.689E-02 9.74E-03	G K
			614.37	-2.460E-02	% P	5.572E-02 1.68E-02	G
			433.93	8.343E-03	&	3.848E-02 1.12E-02	G
CD-109		-9.5488E-02					
			88.04	-9.549E-02	%(P	2.064E+00 6.13E-01	G
SN-113		6.6417E-03					
			391.71	6.642E-03	%(	5.680E-02 1.64E-02	G K
			255.04	4.567E-01	%	1.556E+00 4.63E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	1.0073E-01						
		427.95	3.072E-02	%(P	1.066E-01	3.11E-02	G K
		600.77	-4.309E-02	& P	2.470E-01	7.10E-02	G
		636.15	-4.829E-02	% P	3.773E-01	1.07E-01	G
		463.51	3.080E-01	(P	3.526E-01	1.13E-01	G
		176.29	1.545E-01	% P	5.709E-01	1.70E-01	G
I-131	4.7806E-03						
		364.48	4.781E-03	&(	4.501E-02	1.30E-02	G K
		636.97	1.350E-01	%	5.426E-01	1.57E-01	G
		284.29	1.497E-01	&	5.800E-01	1.72E-01	G
CS-134	0.0000E+00						
		604.66	0.000E+00	%(	6.086E-02	1.73E-02	G K
		795.76	1.683E-02	%	4.624E-02	1.37E-02	G
		569.29	-4.184E-02	&	2.697E-01	7.73E-02	G
		801.84	-1.474E-01	% P	5.764E-01	1.67E-01	G
CS-137	4.4494E-02						
		661.62	4.449E-02	(	4.682E-02	1.55E-02	G
CE-139	-3.4632E-03						
		165.85	-3.463E-03	&(P	4.867E-02	1.44E-02	G
EU-152	3.1771E-03						
		121.78	3.177E-03	%(P	1.441E-01	4.25E-02	G K
		344.30	-1.777E-03	%	1.460E-01	4.20E-02	G
		1408.08	-9.230E-03	%	2.192E-01	5.65E-02	G
		964.00	-6.225E-02	& P	3.684E-01	1.04E-01	G
		1112.07	-9.428E-05	%	4.475E-01	1.22E-01	G
		778.90	8.699E-02	% P	3.431E-01	9.91E-02	G
EU-154	5.9588E-03						
		123.10	5.959E-03	&(P	1.034E-01	3.06E-02	G K
		1274.80	-6.772E-04	%	1.947E-01	5.30E-02	G
		723.30	5.230E-02	% P	2.050E-01	5.91E-02	G
		1004.80	4.348E-02	&	2.545E-01	7.10E-02	G
EU-155	3.1326E-03						
		86.45	3.133E-03	%(P	1.951E-01	5.75E-02	G K
		105.31	3.237E-02	%	2.190E-01	6.51E-02	G
HG-203	-8.6929E-03						
		279.17	-8.693E-03	%(P	4.601E-02	1.36E-02	G K
		72.87	-4.514E-01	%	1.911E+00	5.74E-01	G
		70.83	2.607E-02	%	3.201E+00	9.48E-01	G
		82.50	3.248E-01	%	3.001E+00	8.90E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	2.2361E-01						
		583.14	2.236E-01	(P	5.077E-02	2.54E-02	G
		510.72	3.522E-01	+	1.889E-01	7.96E-02	G
PB-212	4.6259E-01						
		238.63	4.626E-01	(	8.979E-02	3.59E-02	G K
							Energy duplication
		77.11	6.339E-01	+	5.362E-01	1.68E-01	G
		74.81	6.822E-01	& P	1.119E+00	3.41E-01	G
PB-214	3.6164E-01						
		351.99	3.616E-01	(P	8.648E-02	3.71E-02	G K
		295.22	2.800E-01	-	1.960E-01	6.47E-02	G
							Energy duplication
		77.11	1.037E+00	+	8.769E-01	2.75E-01	G
		241.92	2.855E-01	%	5.759E-01	1.75E-01	G
BI-212	-5.2629E-02						
		727.17	-5.263E-02	&(	3.926E-01	1.11E-01	G K
		1620.56	5.535E-02	& P	1.318E+00	3.06E-01	G
		785.42	5.488E-01	% P	1.639E+00	4.78E-01	G
BI-214	3.9978E-01						
		609.32	3.998E-01	(	7.799E-02	4.28E-02	G K
		1764.51	-1.903E-03	& P	1.618E-01	2.20E-02	G
		1120.28	7.563E-01	+	3.792E-01	1.81E-01	G
RA-224	3.1213E-01						
		241.00	3.121E-01	&(P	1.140E+00	3.40E-01	G
RA-226	9.3904E-01						
		185.99	9.390E-01	*(P	1.140E+00	3.52E-01	G
AC-228	6.2992E-01						
		911.07	4.526E-01	(P	2.390E-01	1.14E-01	G K
		968.90	8.745E-01	(P	3.174E-01	1.55E-01	G
		338.40	7.025E-01	(	3.218E-01	1.34E-01	G
TH-227	3.8864E-03						
		236.00	3.886E-03	%(P	4.747E-01	1.40E-01	G K
		256.25	1.150E-01	&	4.595E-01	1.36E-01	G
PA-234	1.3285E-01						
		98.44	2.470E-02	%(	2.291E-01	6.81E-02	G K
		946.00	2.814E-02	%	2.436E-01	6.77E-02	G
		131.28	-4.456E-02	%	2.105E-01	6.28E-02	G
		94.67	3.080E-01	*(	3.788E-01	1.17E-01	G
		883.24	-1.834E-02	%	4.062E-01	1.11E-01	G
		926.70	-6.520E-02	%	4.999E-01	1.41E-01	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26-6.446E-02 &   4.009E-01 1.15E-01 G

TH-234       1.2431E+00
                           63.29 7.652E-01 %(P 4.100E+00 1.22E+00 G K
                           92.80 1.864E+00 &(  2.202E+00 6.79E-01 G
                           92.38 7.045E-02 & P 2.749E+00 8.16E-01 G

AM-241      -6.5805E-03
                           59.54-6.580E-03 %(  6.397E-01 1.89E-01 G
   ( - This peak used in the nuclide activity average.

   * - Peak is too wide, but only one peak in library.
   ! - Peak is part of a multiplet and this area went
       negative during deconvolution.
   ? - Peak is too narrow.
   @ - Peak is too wide at FW25M, but ok at FWHM.
   % - Peak fails sensitivity test.
   $ - Peak identified, but first peak of this nuclide
       failed one or more qualification tests.
   + - Peak activity higher than counting uncertainty range.
   - - Peak activity lower than counting uncertainty range.
   = - Peak outside analysis energy range.
   & - Calculated peak centroid is not close enough to the
       library energy centroid for positive identification.
   P - Peakbackground subtraction
   } - Peak is too close to another for the activity
       to be found directly.

   Nuclide Codes:                      Peak Codes:
   T - Thermal Neutron Activation      G - Gamma Ray
   F - Fast Neutron Activation         X - X-Ray
   I - Fission Product                 P - Positron Decay
   N - Naturally Occurring Isotope     S - Single-Escape
   P - Photon Reaction                 D - Double-Escape
   C - Charged Particle Reaction       K - Key Line
   M - No MDA Calculation              A - Not in Average
   R - Coincidence Corrected           C - Coincidence Peak
   H - Halflife limit exceeded

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
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***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	1.3784E-01	1.3804E-01	2.7720E-01	2.7731E-01	3.054E-01
K-40		1.0358E+01	1.0358E+01	1.6272E+00	1.7279E+00	
MN-54	#A	-3.9198E-04	-3.9208E-04	1.8655E-02	1.8655E-02	5.315E-02
CO-57	#B	1.4368E-03	1.4372E-03	4.3269E-02	4.3269E-02	4.889E-02
CO-60	#B	4.4827E-03	4.4829E-03	4.5461E-02	4.5461E-02	5.608E-02

Sr-85	#A	-1.6643E-02	-1.6663E-02	4.5497E-02	4.5507E-02	5.093E-02
Kr-85	#A	-3.8422E+02	-3.8422E+02	1.0491E+03	1.0493E+03	1.176E+03
Y-88	#B	-5.5378E-03	-5.5418E-03	4.0760E-02	4.0761E-02	5.172E-02
NB-94	#B	-9.1798E-05	-9.1798E-05	3.5032E-02	3.5032E-02	4.362E-02
Ag-108M	#B	-1.7366E-04	-1.7366E-04	2.9235E-02	2.9235E-02	3.689E-02
CD-109	#A	-9.5472E-02	-9.5488E-02	3.1210E+00	3.1210E+00	2.063E+00
SN-113	#B	6.6372E-03	6.6417E-03	4.9132E-02	4.9133E-02	5.676E-02
SB-125	#B	1.0072E-01	1.0073E-01	1.1080E-01	1.1094E-01	1.066E-01
I-131	#B	4.7348E-03	4.7806E-03	3.9000E-02	3.9001E-02	4.458E-02
CS-134	#B	0.0000E+00	0.0000E+00	5.1957E-02	5.1957E-02	6.086E-02
CS-137	#A	4.4494E-02	4.4494E-02	4.6582E-02	4.6649E-02	4.682E-02
CE-139	#A	-3.4612E-03	-3.4632E-03	4.9766E-02	4.9766E-02	4.865E-02
EU-152	#B	3.1771E-03	3.1771E-03	1.2741E-01	1.2741E-01	1.441E-01
EU-154	#B	5.9587E-03	5.9588E-03	9.1671E-02	9.1671E-02	1.034E-01
EU-155	#B	3.1325E-03	3.1326E-03	1.7254E-01	1.7254E-01	1.951E-01
HG-203	#B	-8.6784E-03	-8.6929E-03	4.1377E-02	4.1380E-02	4.593E-02
TL-208		2.2361E-01	2.2361E-01	7.5991E-02	7.7020E-02	
PB-212	#	4.6259E-01	4.6259E-01	1.0775E-01	1.1083E-01	8.979E-02
PB-214	#	3.6164E-01	3.6164E-01	1.1145E-01	1.1328E-01	8.648E-02
BI-212	#B	-5.2629E-02	-5.2629E-02	3.3343E-01	3.3344E-01	3.926E-01
BI-214		3.9978E-01	3.9978E-01	1.2814E-01	1.3009E-01	
RA-224	#A	3.1213E-01	3.1213E-01	1.0210E+00	1.0212E+00	1.140E+00
RA-226	#A	9.3904E-01	9.3904E-01	1.0575E+00	1.0588E+00	1.140E+00
AC-228		6.2992E-01	6.2992E-01	2.2734E-01	2.3008E-01	
TH-227	#B	3.8864E-03	3.8864E-03	4.2005E-01	4.2005E-01	4.747E-01
PA-234	#B	1.3285E-01	1.3285E-01	1.5125E-01	1.5143E-01	2.291E-01
TH-234	#B	1.2431E+00	1.2431E+00	1.3591E+00	1.3608E+00	4.100E+00
AM-241	#A	-6.5805E-03	-6.5805E-03	5.6745E-01	5.6745E-01	6.397E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (50.2 to 1999.0 keV) 1.1611247E+01 pCi/gm
Total Decayed Activity (50.2 to 1999.0 keV) 1.1611247E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JPK

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

Sample description
FSS-OOL-05-08-001-F-A

Spectrum Filename: C:\GammaVision\Spectra\102F_9SEP2006_1039.An1

Acquisition information

Start time:	09-Sep-2006 10:39:46
Live time:	2000
Real time:	2011
Dead time:	0.52 %
Detector ID:	3

Detector system
Det 102 - DSPP-468

Calibration
Filename: D2_1LSa.Clb
DET 102 1 Liter Sand Geometry

Energy Calibration

Created:	15-Jan-2005 03:09:29
Zero offset:	0.220 keV
Gain:	0.500 keV/channel
Quadratic:	-6.435E-08 keV/channel^2

Efficiency Calibration

Created:	15-Jan-2005 06:48:10
Type:	Polynomial
Uncertainty:	0.497 %
Coefficients:	-0.294180 -5.980622 0.744607
	-0.096737 0.005214 -0.000120

Library Files

Main analysis library:	FSS_Rev_1.Lib
Library Match Width:	1.000
Peak stripping:	Library based

Analysis parameters

Analysis engine:	Env32 G53W4.20
Start channel:	100 (50.22keV)
Stop channel:	4000 (1999.02keV)
Peak rejection level:	41.667%
Peak search sensitivity:	3
Sample Size:	1.5070E+03
Activity scaling factor:	1.0000E+06/(1.0000E+00* 1.5070E+03) = 6.6357E+02
Detection limit method:	Nureg 4.16
Random error:	1.0000000E+00
Systematic error:	1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	09-Sep-2006 07:30:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	102_150K_28APR05.Pbc 01-May-2005 05:27:47
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 11 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.8169

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
77.18	92.	33.01	1.50	9.541E-03	77.11	10.700	PBC<MDA	PB214
					77.11	17.500	4.961E-01	PB212
77.18	92.	33.01	1.50	9.541E-03	77.11	10.700	8.114E-01	PB214
					77.11	17.500	4.961E-01	PB212
187.64	85.	25.50	1.64	1.619E-02	185.99	3.280	1.350E+00	RA226
209.56	57.	35.31	1.35	1.518E-02				
239.09	180.	9.26	1.22	1.378E-02	238.63	43.100	2.708E-01	PB212
242.18	59.	22.24	1.22	1.364E-02	241.00	3.900	9.681E-01	RA224
					241.92	7.470	5.172E-01	PB214
295.52	112.	13.19	1.55	1.145E-02	295.22	19.200	4.542E-01	PB214
339.31	46.	30.61	1.07	1.003E-02	338.40	12.010	3.407E-01	AC228
352.47	208.	10.05	1.30	9.666E-03	351.99	37.100	5.180E-01	PB214
511.75	39.	25.95	2.03	6.695E-03	510.72	22.500	2.334E-01	TL208
584.01	41.	21.07	1.46	5.882E-03	583.14	86.000	7.186E-02	TL208
610.21	130.	11.41	1.33	5.642E-03	609.32	46.090	4.491E-01	BI214
912.14	34.	18.95	1.10	3.918E-03	911.07	29.000	2.663E-01	AC228
969.34	43.	21.00	1.12	3.716E-03	968.90	17.460	5.880E-01	AC228
1121.89	42.	16.96	1.55	3.279E-03	1120.28	15.040	7.555E-01	BI214
1462.72	138.	8.51	1.96	2.618E-03	1460.75	10.700	4.408E+00	K40

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

Peak Centroid Channel	Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
418.74	209.56	122.	57.	0.028	105.92	1.348	AC-228	s
477.82	239.10	49.	180.	0.090	27.78	1.215	PB-212	D

Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM	Suspected	
484.00	242.19	56.	59.	0.029	66.72	1.217	PB-214	D
1938.88	969.34	9.	44.	0.022	53.99	1.120	AC-228	s

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-214	153.80	77.11	419.	92.	0.046	99.03	1.500D
PB-212	153.80	77.11	419.	92.	0.046	99.03	1.500D
RA-226	372.65	186.52	184.	54.	0.027	104.02	1.500s
PB-212	477.70	239.03	135.	121.	0.060	49.09	1.500
RA-224	484.16	242.26	131.	50.	0.025	103.04	1.500
PB-214	484.33	242.35	130.	56.	0.028	95.33	1.500
PB-214	590.85	295.60	57.	109.	0.055	41.10	1.500s
AC-228	677.38	338.85	55.	31.	0.015	115.24	1.500s
PB-214	704.51	352.41	52.	165.	0.083	29.74	1.500
TL-208	1023.28	511.75	24.	39.	0.020	77.84	2.033s
TL-208	1167.85	584.01	14.	41.	0.020	63.20	1.460s
BI-214	1220.27	610.21	28.	130.	0.065	34.24	1.327
AC-228	1824.83	912.34	6.	21.	0.010	80.40	1.679s
BI-214	2244.18	1121.89	2.	42.	0.021	50.87	1.552
K-40	2926.34	1462.72	0.	138.	0.069	25.54	1.958

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Code	MDA Value pCi/gm	COMMENTS
BE-7		-7.1997E-03					
			477.56	-7.200E-03	&(	2.992E-01	8.13E-02 G
K-40		4.4081E+00					
			1460.75	4.408E+00	(P	2.357E-01	3.76E-01 G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
MN-54	9.9751E-03						
		834.81	9.975E-03	%(P	3.191E-02	9.12E-03	G
CO-57	-6.1029E-03						
		122.07	-6.103E-03	%(	4.171E-02	1.23E-02	G K
		136.43	4.035E-02	&	3.298E-01	9.71E-02	G
CO-60	-4.9528E-03						
		1332.51	-4.953E-03	%(P	6.130E-02	1.64E-02	G K
		1173.23	7.752E-03	%	6.137E-02	1.69E-02	G K
Sr-85	-6.6527E-03						
		514.00	-6.653E-03	%(	4.538E-02	1.30E-02	G
Kr-85	-1.5337E+02						
		513.99	-1.534E+02	%(	1.046E+03	3.00E+02	G
Y-88	-2.7594E-05						
		1836.01	-2.759E-05	%(P	3.099E-02	4.20E-03	G K
		898.02	-4.026E-03	& P	4.180E-02	1.07E-02	G
NB-94	5.5668E-04						
		871.10	5.567E-04	%(	3.695E-02	9.47E-03	G K
		702.50	1.258E-02	%	3.284E-02	9.73E-03	G K
Ag-108M	-2.2898E-03						
		722.95	-2.290E-03	%(	3.938E-02	1.05E-02	G K
		614.37	-2.871E-02	% P	6.506E-02	1.96E-02	G
		433.93	1.152E-02	%	3.285E-02	9.71E-03	G
CD-109	-7.2312E-02						
		88.04	-7.231E-02	%(P	1.552E+00	4.55E-01	G
SN-113	8.2902E-03						
		391.71	8.290E-03	&(	3.884E-02	1.11E-02	G K
		255.04	-4.575E-01	%	1.613E+00	4.78E-01	G
SB-125	3.4089E-02						
		427.95	3.409E-02	%(P	1.115E-01	3.25E-02	G K
		600.77	2.344E-03	& P	1.825E-01	4.85E-02	G
		636.15	-3.572E-02	% P	2.902E-01	7.90E-02	G
		463.51	7.562E-02	% P	2.970E-01	8.43E-02	G
		176.29	-1.041E-01	& P	5.792E-01	1.70E-01	G
I-131	3.6205E-03						
		364.48	3.621E-03	%(	3.124E-02	8.75E-03	G K
		636.97	-4.647E-02	%	4.193E-01	1.13E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
		284.29	5.410E-02	%	4.381E-01	1.25E-01	G
CS-134	8.9387E-05						
		604.66	8.939E-05	%(	3.907E-02	1.05E-02	G K
		795.76	1.173E-02	%	5.439E-02	1.55E-02	G
		569.29	0.000E+00	&	2.168E-01	5.79E-02	G
		801.84	-2.865E-02	% P	5.392E-01	1.46E-01	G
CS-137	2.6129E-04						
		661.62	2.613E-04	%(	4.658E-02	1.25E-02	G
CE-139	-1.6282E-02						
		165.85	-1.628E-02	%(P	4.484E-02	1.35E-02	G
EU-152	-2.3731E-02						
		121.78	-2.373E-02	%(P	1.199E-01	3.54E-02	G K
		344.30	-7.397E-03	%	1.447E-01	4.15E-02	G
		1408.08	-2.818E-02	&	2.924E-01	7.87E-02	G
		964.00	-8.855E-03	% P	3.873E-01	1.04E-01	G
		1112.07	-4.378E-02	%	4.374E-01	1.20E-01	G
		778.90	-3.322E-02	% P	3.299E-01	9.01E-02	G
EU-154	-1.4875E-02						
		123.10	-1.488E-02	%(P	9.323E-02	2.76E-02	G K
		1274.80	0.000E+00	%	1.904E-01	5.07E-02	G
		723.30	-5.491E-03	% P	1.921E-01	5.04E-02	G
		1004.80	7.296E-02	&	1.978E-01	5.81E-02	G
EU-155	4.6512E-02						
		86.45	4.651E-02	%(P	2.285E-01	6.81E-02	G K
		105.31	-6.036E-02	%	2.186E-01	6.54E-02	G
HG-203	-1.1326E-02						
		279.17	-1.133E-02	&(P	4.388E-02	1.30E-02	G K
		72.87	-2.931E-01	%	1.781E+00	5.31E-01	G
		70.83	-9.415E-01	%	3.316E+00	9.95E-01	G
		82.50	-7.730E-01	&	3.669E+00	1.10E+00	G
TL-208	7.1862E-02						
		583.14	7.186E-02	@(P	3.611E-02	1.53E-02	G
		510.72	2.334E-01	+	1.515E-01	6.07E-02	G
PB-212	1.8233E-01						
		238.63	1.823E-01	(	8.583E-02	2.98E-02	G K
						Energy duplication	
		77.11	4.961E-01	+	5.267E-01	1.64E-01	G
		74.81	5.213E-01	& P	1.103E+00	3.34E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
PB-214	4.3147E-01						
		351.99	4.126E-01	(P	9.095E-02	4.10E-02	G K
		295.22	4.445E-01	(	1.546E-01	6.09E-02	G
							Energy duplication
		77.11	8.114E-01	+	8.614E-01	2.68E-01	G
		241.92	4.919E-01	&(	4.910E-01	1.56E-01	G
BI-212	1.8335E-01						
		727.17	1.834E-01	%(	2.985E-01	9.44E-02	G K
		1620.56	-2.750E-01	% P	2.131E+00	5.52E-01	G
		785.42	6.507E-01	% P	2.233E+00	6.48E-01	G
BI-214	4.4909E-01						
		609.32	4.491E-01	(	9.365E-02	5.13E-02	G K
		1764.51	-2.194E-03	% P	1.865E-01	2.53E-02	G
		1120.28	7.555E-01	+	1.803E-01	1.28E-01	G
RA-224	8.4286E-01						
		241.00	8.429E-01	&(P	9.413E-01	2.96E-01	G
RA-226	9.1542E-01						
		185.99	9.154E-01	*(P	1.107E+00	3.43E-01	G
AC-228	1.8376E-01						
		911.07	1.651E-01	(P	1.094E-01	4.47E-02	G K
		968.90	-1.733E-02	% P	2.085E-01	5.40E-02	G
		338.40	2.287E-01	*(	2.759E-01	8.79E-02	G
TH-227	4.0818E-02						
		236.00	4.082E-02	%(P	3.065E-01	8.96E-02	G K
		256.25	-5.200E-02	%	3.849E-01	1.11E-01	G
PA-234	2.4635E-02						
		98.44	2.464E-02	%(	2.330E-01	6.91E-02	G K
		946.00	1.677E-02	%	1.653E-01	4.28E-02	G
		131.28	-5.411E-02	%	1.876E-01	5.61E-02	G
		94.67	5.560E-02	&	4.087E-01	1.22E-01	G
		883.24	-2.233E-03	%	3.424E-01	8.89E-02	G
		926.70	3.263E-02	&	3.136E-01	8.21E-02	G
		569.26	0.000E+00	&	3.216E-01	8.58E-02	G
TH-234	8.0348E-01						
		63.29	8.035E-01	%(P	4.256E+00	1.27E+00	G K
		92.80	1.026E+00	%	2.145E+00	6.50E-01	G
		92.38	1.161E+00	% P	2.612E+00	7.90E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
AM-241	-7.5848E-03						
		59.54	-7.585E-03	%(	6.517E-01	1.92E-01	G

(- This peak used in the nuclide activity average.

* - Peak is too wide, but only one peak in library.
! - Peak is part of a multiplet and this area went negative during deconvolution.
? - Peak is too narrow.
@ - Peak is too wide at FW25M, but ok at FWHM.
% - Peak fails sensitivity test.
$ - Peak identified, but first peak of this nuclide failed one or more qualification tests.
+ - Peak activity higher than counting uncertainty range.
- - Peak activity lower than counting uncertainty range.
= - Peak outside analysis energy range.
& - Calculated peak centroid is not close enough to the library energy centroid for positive identification.
P - Peakbackground subtraction
} - Peak is too close to another for the activity to be found directly.

Nuclide Codes:
T - Thermal Neutron Activation
F - Fast Neutron Activation
I - Fission Product
N - Naturally Occurring Isotope
P - Photon Reaction
C - Charged Particle Reaction
M - No MDA Calculation
R - Coincidence Corrected
H - Halflife limit exceeded

Peak Codes:
G - Gamma Ray
X - X-Ray
P - Positron Decay
S - Single-Escape
D - Double-Escape
K - Key Line
A - Not in Average
C - Coincidence Peak

- -

***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	-7.1874E-03	-7.1997E-03	2.4396E-01	2.4396E-01	2.987E-01
K-40		4.4081E+00	4.4081E+00	1.1270E+00	1.1538E+00	
MN-54	#A	9.9721E-03	9.9751E-03	2.7370E-02	2.7376E-02	3.190E-02
CO-57	#B	-6.1009E-03	-6.1029E-03	3.6901E-02	3.6902E-02	4.169E-02
CO-60	#B	-4.9526E-03	-4.9528E-03	5.4388E-02	5.4389E-02	6.130E-02
Sr-85	#A	-6.6434E-03	-6.6527E-03	3.9019E-02	3.9021E-02	4.532E-02
Kr-85	#A	-1.5337E+02	-1.5337E+02	8.9951E+02	8.9955E+02	1.046E+03
Y-88	#B	-2.7570E-05	-2.7594E-05	1.6556E-04	1.6557E-04	3.096E-02
NB-94	#B	5.5668E-04	5.5668E-04	2.8414E-02	2.8414E-02	3.695E-02
Ag-108M	#B	-2.2898E-03	-2.2898E-03	3.1459E-02	3.1459E-02	3.938E-02
CD-109	#A	-7.2297E-02	-7.2312E-02	3.1364E+00	3.1364E+00	1.552E+00

SN-113	#B	8.2836E-03	8.2902E-03	3.3251E-02	3.3255E-02	3.881E-02
SB-125	#B	3.4086E-02	3.4089E-02	9.7571E-02	9.7590E-02	1.115E-01
I-131	#B	3.5796E-03	3.6205E-03	2.6249E-02	2.6250E-02	3.089E-02
CS-134	#B	8.9376E-05	8.9387E-05	3.1610E-02	3.1610E-02	3.907E-02
CS-137	#A	2.6129E-04	2.6129E-04	3.7470E-02	3.7470E-02	4.658E-02
CE-139	#A	-1.6272E-02	-1.6282E-02	4.1805E-02	4.1815E-02	4.481E-02
EU-152	#B	-2.3731E-02	-2.3731E-02	1.2151E-01	1.2152E-01	1.199E-01
EU-154	#B	-1.4875E-02	-1.4875E-02	8.5702E-02	8.5706E-02	9.322E-02
EU-155	#B	4.6510E-02	4.6512E-02	2.0434E-01	2.0436E-01	2.285E-01
HG-203	#B	-1.1303E-02	-1.1326E-02	3.9469E-02	3.9474E-02	4.379E-02
TL-208	#	7.1862E-02	7.1862E-02	4.5871E-02	4.6047E-02	
PB-212	#	1.8233E-01	1.8233E-01	8.9510E-02	9.0093E-02	8.583E-02
PB-214	#	4.3147E-01	4.3147E-01	1.2862E-01	1.3088E-01	9.095E-02
BI-212	#B	1.8335E-01	1.8335E-01	2.8331E-01	2.8350E-01	2.985E-01
BI-214		4.4909E-01	4.4909E-01	1.5376E-01	1.5581E-01	
RA-224	#A	8.4286E-01	8.4286E-01	8.8858E-01	8.8984E-01	9.413E-01
RA-226	#A	9.1542E-01	9.1542E-01	1.0302E+00	1.0315E+00	1.107E+00
AC-228	#	1.8376E-01	1.8376E-01	1.2957E-01	1.2998E-01	1.094E-01
TH-227	#B	4.0818E-02	4.0818E-02	2.6868E-01	2.6869E-01	3.065E-01
PA-234	#B	2.4635E-02	2.4635E-02	2.0730E-01	2.0731E-01	2.330E-01
TH-234	#B	8.0348E-01	8.0348E-01	3.8028E+00	3.8031E+00	4.256E+00
AM-241	#A	-7.5848E-03	-7.5848E-03	5.7620E-01	5.7620E-01	6.517E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (295.2 to 1999.0 keV) 4.9290137E+00 pCi/gm
Total Decayed Activity (295.2 to 1999.0 keV) 4.9290137E+00 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JJM

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 102F_9SEP2006_1411.An1

Sample description
FSS-OOL-05-08-007-F-A

Spectrum Filename: C:\GammaVision\Spectra\102F_9SEP2006_1411.An1

Acquisition information
Start time: 09-Sep-2006 14:11:14
Live time: 2000
Real time: 2011
Dead time: 0.53 %
Detector ID: 3

Detector system
Det 102 - DSPP-468

Calibration
Filename: D2_1LSa.Clb
DET 102 1 Liter Sand Geometry

Energy Calibration
Created: 15-Jan-2005 03:09:29
Zero offset: 0.220 keV
Gain: 0.500 keV/channel
Quadratic: -6.435E-08 keV/channel^2

Efficiency Calibration
Created: 15-Jan-2005 06:48:10
Type: Polynomial
Uncertainty: 0.497 %
Coefficients: -0.294180 -5.980622 0.744607
-0.096737 0.005214 -0.000120

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.22keV)
Stop channel: 4000 (1999.02keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 1.4220E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.4220E+03) =
7.0323E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

YAEC Chemistry Lab Spectrum name: 102F_9SEP2006_1411.An1

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	09-Sep-2006 07:45:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	102_150K_28APR05.Pbc 01-May-2005 05:27:47
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 12 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.7817

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
77.15	90.	32.49	1.50	9.541E-03	77.11	10.700	PBC<MDA	PB214
					77.11	17.500	5.113E-01	PB212
77.15	90.	32.49	1.50	9.541E-03	77.11	10.700	8.363E-01	PB214
					77.11	17.500	5.113E-01	PB212
85.73	107.	31.21	1.85	1.182E-02				
85.73	107.	31.21	1.85	1.182E-02	86.45	32.740	2.506E-01	EU155
186.08	49.	38.88	1.50	1.627E-02	185.99	3.280	PBC<MDA	RA226
238.94	156.	10.37	1.21	1.380E-02	238.63	43.100	2.495E-01	PB212
243.19	39.	36.42	1.22	1.360E-02	241.00	3.900	PBC<MDA	RA224
					241.92	7.470	3.595E-01	PB214
295.37	119.	13.97	1.33	1.146E-02	295.22	19.200	5.137E-01	PB214
338.62	56.	30.41	0.80	1.005E-02	338.40	12.010	4.405E-01	AC228
352.44	212.	9.36	1.41	9.666E-03	351.99	37.100	5.606E-01	PB214
511.93	30.	30.76	1.50	6.695E-03	510.72	22.500	1.884E-01	TL208
584.41	42.	21.08	1.49	5.878E-03	583.14	86.000	7.841E-02	TL208
610.21	148.	10.44	1.10	5.642E-03	609.32	46.090	5.391E-01	BI214
913.01	43.	19.16	1.54	3.915E-03	911.07	29.000	3.557E-01	AC228
969.77	23.	31.99	0.98	3.715E-03				
1121.86	40.	17.07	1.86	3.283E-03	1120.28	15.040	7.679E-01	BI214
1463.05	121.	9.09	1.98	2.617E-03				

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

Peak Centroid Channel	Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
171.04	85.73	376.	107.	0.054	93.64	1.850	BI-207	1

1939.76	969.77	9.	24.	0.012	82.61	0.978	AC-228	s
2927.02	1463.05	-1.	122.	0.061	26.79	1.983	K-40	M

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.
M - Peak is close to a library peak.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-214	153.80	77.11	381.	90.	0.045	97.46	1.500D
PB-212	153.80	77.11	381.	90.	0.045	97.46	1.500D
PB-212	477.50	238.93	158.	131.	0.066	48.25	1.500
RA-224	484.26	242.31	118.	60.	0.030	84.38	1.500
PB-214	484.06	242.22	129.	57.	0.029	93.28	1.500
PB-214	591.21	295.78	63.	112.	0.056	41.36	1.500s
AC-228	677.19	338.75	44.	31.	0.016	104.54	1.500s
PB-214	704.59	352.45	46.	193.	0.097	26.16	1.500
TL-208	1023.64	511.93	27.	30.	0.015	92.29	1.500
TL-208	1168.66	584.41	17.	42.	0.021	63.25	1.494
BI-214	1220.27	610.21	24.	148.	0.074	31.31	1.102
AC-228	1825.96	912.91	13.	27.	0.013	79.59	1.679s
BI-214	2244.11	1121.86	2.	40.	0.020	51.22	1.860

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	Peak MDA Value pCi/gm	COMMENTS
BE-7		-4.1231E-02					
			477.56	-4.123E-02	%(	3.471E-01 9.75E-02	G
K-40		-5.4272E-02					
			1460.75	-5.427E-02	%(P	7.124E-01 1.92E-01	G
MN-54		-1.6170E-03					
			834.81	-1.617E-03	&(P	5.170E-02 1.39E-02	G
CO-57		1.5627E-02					
			122.07	1.563E-02	&(	4.428E-02 1.33E-02	G K
			136.43	-1.247E-01	%	3.845E-01 1.15E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CO-60	-5.3833E-03						
		1332.51	-5.383E-03	&(P	7.177E-02	1.94E-02	G K
		1173.23	-7.213E-03	%	5.817E-02	1.59E-02	G K
Sr-85	-3.9946E-03						
		514.00	-3.995E-03	%(	4.440E-02	1.25E-02	G
Kr-85	-9.1772E+01						
		513.99	-9.177E+01	%(	1.022E+03	2.88E+02	G
Y-88	-2.9269E-05						
		1836.01	-2.927E-05	%(P	3.287E-02	4.46E-03	G K
		898.02	-1.505E-02	% P	6.239E-02	1.76E-02	G
NB-94	-1.2008E-02						
		871.10	-1.201E-02	%(	5.998E-02	1.71E-02	G K
		702.50	-2.122E-03	&	4.430E-02	1.20E-02	G K
Ag-108M	6.9035E-03						
		722.95	6.904E-03	%(	4.551E-02	1.26E-02	G K
		614.37	-1.965E-02	& P	6.623E-02	1.95E-02	G
		433.93	-6.297E-03	%	3.957E-02	1.13E-02	G
CD-109	-4.5655E-01						
		88.04	-4.566E-01	&(P	2.264E+00	6.76E-01	G
SN-113	-6.9304E-03						
		391.71	-6.930E-03	%(	5.835E-02	1.67E-02	G K
		255.04	-2.829E-01	%	1.796E+00	5.26E-01	G
SB-125	6.2318E-03						
		427.95	6.232E-03	&(P	8.942E-02	2.40E-02	G K
		600.77	-8.492E-03	& P	2.150E-01	5.82E-02	G
		636.15	-5.429E-04	% P	3.252E-01	8.57E-02	G
		463.51	5.609E-02	% P	3.165E-01	8.81E-02	G
		176.29	-1.366E-02	& P	6.131E-01	1.78E-01	G
I-131	2.3709E-04						
		364.48	2.371E-04	&(	3.603E-02	9.90E-03	G K
		636.97	0.000E+00	&	5.868E-01	1.58E-01	G
		284.29	1.439E-02	&	6.989E-01	2.01E-01	G
CS-134	-5.8475E-03						
		604.66	-5.847E-03	%(	4.674E-02	1.32E-02	G K
		795.76	9.801E-03	%	4.786E-02	1.34E-02	G
		569.29	1.880E-02	&	2.462E-01	6.78E-02	G
		801.84	1.594E-01	& P	5.718E-01	1.65E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CS-137	7.0816E-03						
		661.62	7.082E-03	%(	4.909E-02	1.37E-02	G
CE-139	-4.3938E-03						
		165.85	-4.394E-03	%(P	4.821E-02	1.41E-02	G
EU-152	-3.7540E-03						
		121.78	-3.754E-03	&(P	1.497E-01	4.38E-02	G K
		344.30	2.080E-02	%	1.054E-01	3.03E-02	G
		1408.08	-1.312E-02	%	3.172E-01	8.39E-02	G
		964.00	2.676E-03	& P	3.175E-01	8.19E-02	G
		1112.07	1.211E-01	%	3.511E-01	1.03E-01	G
		778.90	-1.475E-03	% P	3.233E-01	8.46E-02	G
EU-154	-2.4399E-02						
		123.10	-2.440E-02	%(P	1.134E-01	3.38E-02	G K
		1274.80	1.382E-02	&	1.643E-01	4.38E-02	G
		723.30	2.314E-02	% P	2.210E-01	6.06E-02	G
		1004.80	-1.418E-02	&	3.369E-01	9.11E-02	G
EU-155	1.0361E-01						
		86.45	1.036E-01	%(P	2.441E-01	7.37E-02	G K
		105.31	0.000E+00	%	2.418E-01	7.10E-02	G
HG-203	8.0315E-03						
		279.17	8.031E-03	%(P	4.341E-02	1.27E-02	G K
		72.87	-4.178E-01	&	1.904E+00	5.70E-01	G
		70.83	-8.523E-01	%	3.486E+00	1.04E+00	G
		82.50	-1.092E+00	%	3.573E+00	1.07E+00	G
TL-208	7.8409E-02						
		583.14	7.841E-02	(P	4.135E-02	1.67E-02	G
		510.72	1.884E-01	+	1.706E-01	5.80E-02	G
PB-212	2.0992E-01						
		238.63	2.099E-01	(	9.780E-02	3.38E-02	G K
							Energy duplication
		77.11	5.113E-01	+	5.331E-01	1.66E-01	G
		74.81	4.896E-01	& P	1.136E+00	3.43E-01	G
PB-214	5.0548E-01						
		351.99	5.120E-01	(P	9.108E-02	4.47E-02	G K
		295.22	4.825E-01	@(	1.711E-01	6.65E-02	G
							Energy duplication
		77.11	8.363E-01	+	8.719E-01	2.72E-01	G
		241.92	5.319E-01	&(	5.184E-01	1.65E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
BI-212	2.1379E-03						
		727.17	2.138E-03	%(	4.593E-01	1.26E-01	G K
		1620.56	3.825E-02	% P	1.644E+00	3.78E-01	G
		785.42	-1.607E-02	% P	2.018E+00	5.26E-01	G
BI-214	5.3907E-01						
		609.32	5.391E-01	(	9.373E-02	5.63E-02	G K
		1764.51	1.631E-01	% P	2.739E-01	8.97E-02	G
		1120.28	7.679E-01	+	1.821E-01	1.31E-01	G
RA-224	1.0639E+00						
		241.00	1.064E+00	&(P	9.476E-01	3.05E-01	G
RA-226	8.7379E-01						
		185.99	8.738E-01	%(P	1.205E+00	3.71E-01	G
AC-228	2.3132E-01						
		911.07	2.249E-01	?(P	1.608E-01	6.02E-02	G K
		968.90	-3.987E-03	% P	2.984E-01	7.87E-02	G
		338.40	2.468E-01	@(	2.646E-01	8.60E-02	G
TH-227	-9.6396E-02						
		236.00	-9.640E-02	%(P	3.945E-01	1.17E-01	G K
		256.25	8.727E-02	&	5.210E-01	1.52E-01	G
PA-234	2.8128E-03						
		98.44	2.813E-03	%(	2.638E-01	7.79E-02	G K
		946.00	-2.490E-02	%	2.392E-01	6.48E-02	G
		131.28	-1.965E-02	%	2.042E-01	6.02E-02	G
		94.67	2.603E-02	%	4.305E-01	1.27E-01	G
		883.24	-4.143E-02	%	4.199E-01	1.15E-01	G
		926.70	-2.030E-02	&	4.141E-01	1.09E-01	G
		569.26	7.648E-02	&	3.353E-01	9.56E-02	G
TH-234	1.9322E+00						
		63.29	1.932E+00	%(P	4.796E+00	1.45E+00	G K
		92.80	1.031E+00	%	2.295E+00	6.95E-01	G
		92.38	1.132E+00	% P	2.804E+00	8.46E-01	G
AM-241	4.7256E-02						
		59.54	4.726E-02	%(	6.962E-01	2.06E-01	G

(- This peak used in the nuclide activity average.

* - Peak is too wide, but only one peak in library.
! - Peak is part of a multiplet and this area went negative during deconvolution.

? - Peak is too narrow.
@ - Peak is too wide at FW25M, but ok at FWHM.
% - Peak fails sensitivity test.
$ - Peak identified, but first peak of this nuclide failed one or more qualification tests.
+ - Peak activity higher than counting uncertainty range.
- - Peak activity lower than counting uncertainty range.
= - Peak outside analysis energy range.
& - Calculated peak centroid is not close enough to the library energy centroid for positive identification.
P - Peakbackground subtraction
} - Peak is too close to another for the activity to be found directly.

Nuclide Codes:
T - Thermal Neutron Activation
F - Fast Neutron Activation
I - Fission Product
N - Naturally Occurring Isotope
P - Photon Reaction
C - Charged Particle Reaction
M - No MDA Calculation
R - Coincidence Corrected
H - Halflife limit exceeded

Peak Codes:
G - Gamma Ray
X - X-Ray
P - Positron Decay
S - Single-Escape
D - Double-Escape
K - Key Line
A - Not in Average
C - Coincidence Peak

- -

***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	-4.1087E-02	-4.1231E-02	2.9240E-01	2.9241E-01	3.459E-01
K-40	#A	-5.4272E-02	-5.4272E-02	6.9523E-01	6.9524E-01	7.124E-01
MN-54	#A	-1.6160E-03	-1.6170E-03	7.6582E-02	7.6582E-02	5.167E-02
CO-57	#B	1.5616E-02	1.5627E-02	3.9869E-02	3.9879E-02	4.425E-02
CO-60	#B	-5.3828E-03	-5.3833E-03	6.4211E-02	6.4211E-02	7.177E-02
Sr-85	#A	-3.9832E-03	-3.9946E-03	3.7564E-02	3.7564E-02	4.428E-02
Kr-85	#A	-9.1772E+01	-9.1772E+01	8.6461E+02	8.6462E+02	1.022E+03
Y-88	#B	-2.9218E-05	-2.9269E-05	1.7562E-04	1.7562E-04	3.281E-02
NB-94	#B	-1.2008E-02	-1.2008E-02	5.1369E-02	5.1373E-02	5.998E-02
Ag-108M	#B	6.9035E-03	6.9035E-03	3.7887E-02	3.7889E-02	4.551E-02
CD-109	#A	-4.5637E-01	-4.5655E-01	2.3142E+00	2.3143E+00	2.263E+00
SN-113	#B	-6.9192E-03	-6.9304E-03	4.9992E-02	4.9994E-02	5.825E-02
SB-125	#B	6.2307E-03	6.2318E-03	7.2027E-02	7.2028E-02	8.940E-02
I-131	#B	2.3167E-04	2.3709E-04	2.9687E-02	2.9687E-02	3.520E-02
CS-134	#B	-5.8460E-03	-5.8475E-03	3.9492E-02	3.9493E-02	4.673E-02
CS-137	#A	7.0815E-03	7.0816E-03	4.1094E-02	4.1096E-02	4.909E-02
CE-139	#A	-4.3878E-03	-4.3938E-03	4.8764E-02	4.8765E-02	4.814E-02
EU-152	#B	-3.7539E-03	-3.7540E-03	3.4793E-01	3.4793E-01	1.497E-01
EU-154	#B	-2.4397E-02	-2.4399E-02	1.0366E-01	1.0367E-01	1.134E-01
EU-155	#B	1.0360E-01	1.0361E-01	2.2096E-01	2.2103E-01	2.441E-01

HG-203 #B	7.9995E-03	8.0315E-03	3.8053E-02	3.8056E-02	4.324E-02

TL-208		7.8409E-02	7.8409E-02	5.0076E-02	5.0269E-02	
PB-212	#	2.0992E-01	2.0992E-01	1.0129E-01	1.0197E-01	9.780E-02
PB-214	#	5.0548E-01	5.0548E-01	1.3248E-01	1.3548E-01	9.108E-02
BI-212	#B	2.1379E-03	2.1379E-03	3.7717E-01	3.7717E-01	4.593E-01
BI-214		5.3907E-01	5.3907E-01	1.6878E-01	1.7147E-01	
RA-224	#	1.0639E+00	1.0639E+00	9.1520E-01	9.1715E-01	9.476E-01
RA-226	#A	8.7379E-01	8.7379E-01	1.1119E+00	1.1129E+00	1.205E+00
AC-228	#	2.3132E-01	2.3132E-01	1.5244E-01	1.5299E-01	1.608E-01
TH-227	#B	-9.6396E-02	-9.6396E-02	3.6419E-01	3.6423E-01	3.945E-01
PA-234	#B	2.8128E-03	2.8128E-03	2.3381E-01	2.3381E-01	2.638E-01
TH-234	#B	1.9322E+00	1.9322E+00	4.3431E+00	4.3445E+00	4.796E+00
AM-241	#A	4.7256E-02	4.7256E-02	6.1786E-01	6.1787E-01	6.962E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (50.2 to 1999.0 keV) 6.1748308E-01 pCi/gm
Total Decayed Activity (50.2 to 1999.0 keV) 6.1748308E-01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JJM

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 102F_13SEPT2006_1435.An1

Sample description
FSS-OOL-05-08-014-F

Spectrum Filename: C:\GammaVision\Spectra\102F_13SEPT2006_1435.An1

Acquisition information
Start time: 13-Sep-2006 14:35:21
Live time: 2000
Real time: 2021
Dead time: 1.04 %
Detector ID: 3

Detector system
Det 102 - DSPP-468

Calibration
Filename: D2_1LSa.Clb
DET 102 1 Liter Sand Geometry

Energy Calibration
Created: 15-Jan-2005 03:09:29
Zero offset: 0.220 keV
Gain: 0.500 keV/channel
Quadratic: -6.435E-08 keV/channel^2

Efficiency Calibration
Created: 15-Jan-2005 06:48:10
Type: Polynomial
Uncertainty: 0.497 %
Coefficients: -0.294180 -5.980622 0.744607
-0.096737 0.005214 -0.000120

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.22keV)
Stop channel: 4000 (1999.02keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 1.7580E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.7580E+03) =
5.6883E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	11-Sep-2006 13:15:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	102_150K_28APR05.Pbc 01-May-2005 05:27:47
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 14 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.6535

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
77.21	203.	21.41	1.50	9.541E-03	77.11	10.700	1.527E+00	PB214
					77.11	17.500	9.338E-01	PB212
77.21	203.	21.41	1.50	9.541E-03	77.11	10.700	1.527E+00	PB214
					77.11	17.500	9.338E-01	PB212
186.59	115.	28.23	1.50	1.624E-02	185.99	3.280	1.587E+00	RA226
209.53	72.	35.77	1.01	1.518E-02				
239.02	618.	4.85	1.22	1.379E-02	238.63	43.100	7.986E-01	PB212
242.08	118.	17.13	1.22	1.365E-02	241.00	3.900	1.688E+00	RA224
					241.92	7.470	8.927E-01	PB214
270.62	82.	29.54	1.69	1.241E-02				
295.76	136.	12.69	1.26	1.145E-02	295.22	19.200	4.737E-01	PB214
300.46	41.	36.34	1.26	1.128E-02				
328.18	47.	33.53	1.64	1.036E-02				
338.80	165.	18.72	0.94	1.005E-02	338.40	12.010	1.049E+00	AC228
352.38	241.	10.52	1.20	9.668E-03	351.99	37.100	5.151E-01	PB214
462.85	48.	31.84	1.08	7.375E-03				
462.85	48.	31.84	1.08	7.375E-03	463.51	10.000	4.887E-01	SB125
511.76	95.	18.79	1.67	6.695E-03	510.72	22.500	4.827E-01	TL208
584.10	170.	10.20	1.59	5.881E-03	583.14	86.000	2.577E-01	TL208
610.05	228.	9.29	1.44	5.643E-03	609.32	46.090	6.719E-01	BI214
729.05	73.	19.29	1.67	4.783E-03	727.17	11.800	9.960E-01	BI212
912.59	133.	11.64	2.22	3.916E-03	911.07	29.000	8.960E-01	AC228
970.66	67.	20.05	0.86	3.712E-03	968.90	17.460	7.906E-01	AC228
1121.82	75.	16.89	1.23	3.283E-03	1120.28	15.040	1.161E+00	BI214
1462.78	540.	4.38	2.20	2.618E-03	1460.75	10.700	1.481E+01	K40
1767.14	12.	38.29	2.24	2.225E-03	1764.51	15.920	PBC<MDA	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
418.67	209.53	248.	72.	0.036	107.31	1.006	AC-228	
477.68	238.98	140.	618.	0.309	14.55	1.215	PB-212	D
483.79	242.04	147.	118.	0.059	51.38	1.217	PB-214	D
540.89	270.62	187.	82.	0.041	88.63	1.686	AC-228	s
600.57	300.36	92.	41.	0.021	109.02	1.258	PB-212	lD
656.04	328.18	87.	47.	0.023	100.58	1.644	AC-228	s
1941.53	970.66	21.	63.	0.032	48.77	1.719	AC-228	D

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-214	153.80	77.11	842.	203.	0.101	64.24	1.500D
PB-212	153.80	77.11	842.	203.	0.101	64.24	1.500D
RA-226	371.92	186.15	412.	92.	0.046	94.32	1.500s
PB-212	477.68	239.02	392.	443.	0.221	23.74	1.500
RA-224	483.78	242.07	388.	96.	0.048	91.25	1.500s
PB-214	483.81	242.09	417.	85.	0.043	106.79	1.500s
PB-214	591.24	295.79	176.	132.	0.066	50.18	1.500
AC-228	677.28	338.80	207.	165.	0.082	56.17	0.937
PB-214	704.52	352.42	99.	226.	0.113	27.28	1.500
SB-125	926.44	463.35	74.	34.	0.017	114.18	1.500s
TL-208	1023.31	511.76	71.	95.	0.047	56.37	1.666s
TL-208	1168.02	584.10	47.	170.	0.085	30.59	1.592
BI-214	1219.96	610.05	59.	228.	0.114	27.88	1.442s
BI-212	1456.63	728.34	55.	51.	0.025	74.76	1.554s
AC-228	1825.33	912.59	31.	133.	0.066	34.92	2.218s
AC-228	1938.01	968.90	29.	55.	0.028	57.62	1.718D
BI-214	2244.05	1121.82	23.	75.	0.037	50.68	1.232s
K-40	2926.55	1462.82	15.	511.	0.255	13.67	2.042
BI-214	3535.74	1767.14	5.	12.	0.006	114.87	2.236s

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	MDA Value pCi/gm	COMMENTS
BE-7		-7.6822E-02					
			477.56	-7.682E-02	%(	4.511E-01 1.31E-01	G
K-40		1.3998E+01					
			1460.75	1.400E+01	(P	5.764E-01 6.38E-01	G
MN-54		-3.8907E-04					
			834.81	-3.891E-04	%(P	7.914E-02 2.25E-02	G
CO-57		1.6617E-02					
			122.07	1.662E-02	&(	5.707E-02 1.71E-02	G K
			136.43	-6.525E-02	%	4.868E-01 1.45E-01	G
CO-60		-2.1118E-04					
			1332.51	-2.112E-04	&(P	8.295E-02 2.29E-02	G K
			1173.23	8.485E-03	%	9.265E-02 2.65E-02	G K
Sr-85		-1.8175E-02					
			514.00	-1.818E-02	&(	6.811E-02 2.02E-02	G
Kr-85		-4.1047E+02					
			513.99	-4.105E+02	&(	1.538E+03 4.57E+02	G
Y-88		6.0623E-03					
			1836.01	6.062E-03	%(P	4.421E-02 1.14E-02	G K
			898.02	-4.617E-03	& P	6.954E-02 1.94E-02	G
NB-94		9.2364E-03					
			871.10	9.236E-03	&(	5.024E-02 1.43E-02	G K
			702.50	-5.506E-03	&	5.642E-02 1.61E-02	G K
Ag-108M		5.1160E-03					
			722.95	5.116E-03	%(	5.672E-02 1.60E-02	G K
			614.37	-1.440E-02	% P	6.554E-02 1.92E-02	G
			433.93	-1.375E-02	%	4.465E-02 1.32E-02	G
CD-109		-1.8233E-01					
			88.04	-1.823E-01	%(P	2.465E+00 7.36E-01	G
SN-113		2.8226E-02					
			391.71	2.823E-02	%(	6.701E-02 2.02E-02	G K
			255.04	1.496E-02	%	1.955E+00 5.70E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	1.0561E-01						
		427.95	2.240E-02	%(P	1.501E-01	4.36E-02	G K
		600.77	-1.021E-03	& P	2.600E-01	7.28E-02	G
		636.15	5.203E-02	& P	4.878E-01	1.40E-01	G
		463.51	3.519E-01	@(P	4.466E-01	1.40E-01	G
		176.29	2.161E-03	% P	6.150E-01	1.80E-01	G
I-131	1.5471E-02						
		364.48	1.547E-02	%(	6.152E-02	1.82E-02	G K
		636.97	1.193E-01	&	8.475E-01	2.44E-01	G
		284.29	-2.085E-01	%	8.563E-01	2.55E-01	G
CS-134	-1.2787E-02						
		604.66	-1.279E-02	%(	5.566E-02	1.63E-02	G K
		795.76	2.408E-02	%	6.610E-02	1.97E-02	G
		569.29	-1.643E-04	%	3.258E-01	9.21E-02	G
		801.84	1.298E-01	% P	5.690E-01	1.64E-01	G
CS-137	7.4561E-03						
		661.62	7.456E-03	&(	6.689E-02	1.92E-02	G
CE-139	-5.5239E-04						
		165.85	-5.524E-04	%(P	5.347E-02	1.58E-02	G
EU-152	4.4008E-02						
		121.78	4.401E-02	&(P	1.723E-01	5.17E-02	G K
		344.30	-3.285E-02	%	1.578E-01	4.66E-02	G
		1408.08	-3.695E-02	%	2.643E-01	7.27E-02	G
		964.00	4.770E-02	% P	4.125E-01	1.16E-01	G
		1112.07	9.575E-02	%	3.890E-01	1.12E-01	G
		778.90	2.832E-04	% P	3.945E-01	1.09E-01	G
EU-154	-2.1297E-02						
		123.10	-2.130E-02	%(P	1.295E-01	3.87E-02	G K
		1274.80	2.655E-02	&	2.124E-01	6.01E-02	G
		723.30	-1.817E-03	% P	4.582E-01	1.32E-01	G
		1004.80	9.739E-02	%	2.803E-01	8.26E-02	G
EU-155	1.5087E-01						
		86.45	1.509E-01	%(P	2.739E-01	8.32E-02	G K
		105.31	8.726E-02	%	2.778E-01	8.36E-02	G
HG-203	1.5924E-02						
		279.17	1.592E-02	&(P	4.309E-02	1.29E-02	G K
		72.87	-3.561E-01	&	2.315E+00	6.94E-01	G
		70.83	2.027E-01	&	3.103E+00	9.20E-01	G
		82.50	-2.712E-01	%	3.745E+00	1.11E+00	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	2.5767E-01						
		583.14	2.577E-01	(P	5.270E-02	2.64E-02	G
		510.72	4.827E-01	+	2.148E-01	9.08E-02	G
PB-212	5.7199E-01						
		238.63	5.720E-01	(	1.227E-01	4.53E-02	G K
							Energy duplication
		77.11	9.338E-01	+	6.350E-01	2.00E-01	G
		74.81	7.508E-01	& P	1.324E+00	4.03E-01	G
PB-214	4.7566E-01						
		351.99	4.840E-01	(P	1.052E-01	4.41E-02	G K
		295.22	4.595E-01	(	2.256E-01	7.69E-02	G
							Energy duplication
		77.11	1.527E+00	+	1.039E+00	3.27E-01	G
		241.92	6.417E-01	+	7.373E-01	2.28E-01	G
BI-212	6.9115E-01						
		727.17	6.911E-01	&(	5.060E-01	1.72E-01	G K
		1620.56	-4.776E-01	% P	2.416E+00	6.70E-01	G
		785.42	-2.338E-01	% P	2.984E+00	8.46E-01	G
BI-214	6.7193E-01						
		609.32	6.719E-01	*(	1.140E-01	6.25E-02	G K
		1764.51	2.659E-01	& P	2.867E-01	1.03E-01	G
		1120.28	1.161E+00	+	3.931E-01	1.96E-01	G
RA-224	1.3802E+00						
		241.00	1.380E+00	&(P	1.361E+00	4.25E-01	G
RA-226	1.3192E+00						
		185.99	1.319E+00	(P	1.402E+00	4.35E-01	G
AC-228	9.4065E-01						
		911.07	8.960E-01	*(P	1.949E-01	1.05E-01	G K
		968.90	6.529E-01	- P	3.272E-01	1.25E-01	G
		338.40	1.049E+00	(	4.440E-01	1.97E-01	G
TH-227	-1.9947E-01						
		236.00	-1.995E-01	%(P	5.457E-01	1.65E-01	G K
		256.25	-1.004E-03	%	6.093E-01	1.78E-01	G
PA-234	7.9207E-03						
		98.44	7.921E-03	&(	2.118E-01	6.27E-02	G K
		946.00	7.451E-02	%	2.874E-01	8.35E-02	G
		131.28	3.679E-02	&	2.646E-01	7.90E-02	G
		94.67	-1.361E-01	%	5.374E-01	1.62E-01	G
		883.24	-6.697E-03	&	4.542E-01	1.25E-01	G
		926.70	-4.133E-04	%	4.661E-01	1.27E-01	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26 3.180E-03 %   4.578E-01 1.29E-01 G

TH-234      -5.4994E-01
                           63.29-5.499E-01 %(P 4.974E+00 1.48E+00 G K
                           92.80 1.666E+00 %   2.760E+00 8.41E-01 G
                           92.38 1.962E+00 % P 3.266E+00 9.95E-01 G

AM-241       1.1232E-01
                           59.54 1.123E-01 %(  6.837E-01 2.04E-01 G
   ( - This peak used in the nuclide activity average.

   * - Peak is too wide, but only one peak in library.
   ! - Peak is part of a multiplet and this area went
       negative during deconvolution.
   ? - Peak is too narrow.
   @ - Peak is too wide at FW25M, but ok at FWHM.
   % - Peak fails sensitivity test.
   $ - Peak identified, but first peak of this nuclide
       failed one or more qualification tests.
   + - Peak activity higher than counting uncertainty range.
   - - Peak activity lower than counting uncertainty range.
   = - Peak outside analysis energy range.
   & - Calculated peak centroid is not close enough to the
       library energy centroid for positive identification.
   P - Peakbackground subtraction
   } - Peak is too close to another for the activity
       to be found directly.

   Nuclide Codes:                      Peak Codes:
   T - Thermal Neutron Activation      G - Gamma Ray
   F - Fast Neutron Activation         X - X-Ray
   I - Fission Product                 P - Positron Decay
   N - Naturally Occurring Isotope     S - Single-Escape
   P - Photon Reaction                 D - Double-Escape
   C - Charged Particle Reaction       K - Key Line
   M - No MDA Calculation              A - Not in Average
   R - Coincidence Corrected           C - Coincidence Peak
   H - Halflife limit exceeded

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
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***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	-7.4799E-02	-7.6822E-02	3.9375E-01	3.9377E-01	4.392E-01
K-40		1.3998E+01	1.3998E+01	1.9134E+00	2.0684E+00	5.764E-01
MN-54	#A	-3.8730E-04	-3.8907E-04	2.8780E-02	2.8780E-02	7.878E-02
CO-57	#B	1.6530E-02	1.6617E-02	5.1424E-02	5.1432E-02	5.677E-02
CO-60	#B	-2.1102E-04	-2.1118E-04	1.0694E-02	1.0695E-02	8.289E-02

Sr-85	#A	-1.7780E-02	-1.8175E-02	6.0696E-02	6.0705E-02	6.663E-02
Kr-85	#A	-4.1046E+02	-4.1047E+02	1.3708E+03	1.3710E+03	1.538E+03
Y-88	#B	5.9818E-03	6.0623E-03	3.4274E-02	3.4276E-02	4.362E-02
NB-94	#B	9.2364E-03	9.2364E-03	4.2952E-02	4.2955E-02	5.024E-02
Ag-108M	#B	5.1159E-03	5.1160E-03	4.8139E-02	4.8140E-02	5.672E-02
CD-109	#A	-1.8176E-01	-1.8233E-01	2.8912E+00	2.8913E+00	2.457E+00
SN-113	#B	2.7879E-02	2.8226E-02	6.0565E-02	6.0585E-02	6.618E-02
SB-125	#B	1.0546E-01	1.0561E-01	1.2612E-01	1.2626E-01	1.499E-01
I-131	#B	1.2958E-02	1.5471E-02	5.4588E-02	5.4595E-02	5.152E-02
CS-134	#B	-1.2763E-02	-1.2787E-02	4.8916E-02	4.8921E-02	5.556E-02
CS-137	#A	7.4551E-03	7.4561E-03	5.7636E-02	5.7638E-02	6.688E-02
CE-139	#A	-5.4669E-04	-5.5239E-04	1.2504E-01	1.2504E-01	5.291E-02
EU-152	#B	4.3995E-02	4.4008E-02	1.5500E-01	1.5502E-01	1.723E-01
EU-154	#B	-2.1287E-02	-2.1297E-02	1.1861E-01	1.1861E-01	1.295E-01
EU-155	#B	1.5075E-01	1.5087E-01	2.4964E-01	2.4978E-01	2.737E-01
HG-203	#B	1.5444E-02	1.5924E-02	3.8751E-02	3.8761E-02	4.179E-02
TL-208		2.5767E-01	2.5767E-01	7.9016E-02	8.0328E-02	
PB-212	#	5.7199E-01	5.7199E-01	1.3578E-01	1.3953E-01	1.227E-01
PB-214	#	4.7566E-01	4.7566E-01	1.2999E-01	1.3270E-01	1.052E-01
BI-212	#	6.9115E-01	6.9115E-01	5.1670E-01	5.1815E-01	5.060E-01
BI-214	#	6.7193E-01	6.7193E-01	1.8733E-01	1.9109E-01	
RA-224	#	1.3802E+00	1.3802E+00	1.2746E+00	1.2770E+00	1.361E+00
RA-226	#A	1.3192E+00	1.3192E+00	1.3049E+00	1.3070E+00	1.402E+00
AC-228		9.4065E-01	9.4065E-01	3.1122E-01	3.1566E-01	
TH-227	#B	-1.9947E-01	-1.9947E-01	5.0057E-01	5.0070E-01	5.457E-01
PA-234	#B	7.9207E-03	7.9207E-03	1.8796E-01	1.8796E-01	2.118E-01
TH-234	#B	-5.4994E-01	-5.4994E-01	4.6734E+00	4.6735E+00	4.974E+00
AM-241	#A	1.1232E-01	1.1232E-01	6.1246E-01	6.1249E-01	6.837E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (1119.8 to 1999.0 keV) 1.6558928E+01 pCi/gm
Total Decayed Activity (1119.8 to 1999.0 keV) 1.6558928E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JPK

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 102F_13SEPT2006_1512.An1

Sample description
FSS-OOL-05-08-022-F-B

Spectrum Filename: C:\GammaVision\Spectra\102F_13SEPT2006_1512.An1

Acquisition information
Start time: 13-Sep-2006 15:12:37
Live time: 2000
Real time: 2018
Dead time: 0.90 %
Detector ID: 3

Detector system
Det 102 - DSPP-468

Calibration
Filename: D2_1LSa.Clb
DET 102 1 Liter Sand Geometry

Energy Calibration
Created: 15-Jan-2005 03:09:29
Zero offset: 0.220 keV
Gain: 0.500 keV/channel
Quadratic: -6.435E-08 keV/channel^2

Efficiency Calibration
Created: 15-Jan-2005 06:48:10
Type: Polynomial
Uncertainty: 0.497 %
Coefficients: -0.294180 -5.980622 0.744607
-0.096737 0.005214 -0.000120

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.22keV)
Stop channel: 4000 (1999.02keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 1.5960E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.5960E+03) =
6.2657E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	12-Sep-2006 07:40:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	102_150K_28APR05.Pbc 01-May-2005 05:27:47
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 13 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.4872

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
77.16	134.	30.03	1.50	9.541E-03	77.11	17.500	6.805E-01	PB212
					77.11	10.700	1.113E+00	PB214
77.16	134.	30.03	1.50	9.541E-03	77.11	17.500	PBC<MDA	PB212
					77.11	10.700	1.113E+00	PB214
87.18	99.	27.02	1.11	1.218E-02				
87.18	99.	27.02	1.11	1.218E-02	88.04	3.790	PBC<MDA	CD109
89.90	69.	35.17	1.11	1.277E-02				
89.90	69.	35.17	1.11	1.277E-02	92.38	2.570	PBC<MDA	TH234
93.35	98.	25.18	1.11	1.346E-02	92.80	3.000	2.082E+00	TH234
186.10	115.	28.18	1.38	1.626E-02	185.99	3.280	1.761E+00	RA226
209.74	110.	27.48	0.82	1.517E-02				
239.06	484.	5.49	1.22	1.379E-02	238.63	43.100	6.881E-01	PB212
241.74	85.	25.66	1.22	1.366E-02	241.00	3.900	PBC<MDA	RA224
					241.92	7.470	7.037E-01	PB214
295.74	137.	17.63	1.33	1.145E-02	295.22	19.200	5.254E-01	PB214
338.99	98.	21.89	1.06	1.004E-02	338.40	12.010	6.833E-01	AC228
352.37	273.	8.10	1.19	9.668E-03	351.99	37.100	6.431E-01	PB214
463.81	29.	36.34	1.50	7.365E-03	463.51	10.000	PBC<MDA	SB125
511.58	114.	17.31	2.05	6.684E-03	510.72	22.500	6.419E-01	TL208
584.04	186.	9.68	1.35	5.881E-03	583.14	86.000	3.106E-01	TL208
610.11	174.	10.25	1.30	5.642E-03	609.32	46.090	5.658E-01	BI214
728.66	25.	35.15	1.55	4.794E-03	727.17	11.800	PBC<MDA	BI212
796.55	24.	38.20	1.60	4.420E-03	795.76	85.400	PBC<MDA	CS134
912.81	107.	12.73	1.24	3.915E-03	911.07	29.000	7.934E-01	AC228
969.71	84.	17.52	1.74	3.715E-03				
1121.80	49.	19.78	1.47	3.279E-03	1120.28	15.040	8.437E-01	BI214
1462.80	460.	4.72	1.66	2.618E-03	1460.75	10.700	1.388E+01	K40

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide
173.93	87.29	307.	99.	0.049	81.06	1.107	PB-214 lD
179.38	90.01	261.	69.	0.035	105.51	1.109	PB-214 lD
419.10	209.74	268.	110.	0.055	82.45	0.819	NP-239 sM
477.74	239.01	111.	484.	0.242	16.48	1.215	PB-212 D
483.10	241.70	194.	85.	0.042	76.99	1.217	PB-214 D
1939.63	969.71	37.	83.	0.042	45.13	1.739	AC-228 M
2244.73	1121.80	15.	33.	0.017	71.48	1.820	TA-182 D

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.
M - Peak is close to a library peak.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-212	153.80	77.11	745.	134.	0.067	90.08	1.500D
PB-214	153.80	77.11	745.	134.	0.067	90.08	1.500D
TH-234	185.51	92.97	663.	102.	0.051	111.22	1.500
RA-226	372.18	186.29	328.	100.	0.050	78.58	1.500s
PB-212	477.66	239.01	290.	374.	0.187	24.78	1.500
RA-224	483.48	241.92	334.	75.	0.038	107.07	1.500
PB-214	483.45	241.91	342.	71.	0.036	115.81	1.500
PB-214	591.11	295.73	145.	119.	0.060	50.88	1.500
AC-228	677.52	338.92	89.	91.	0.045	54.23	1.500
PB-214	704.63	352.47	73.	254.	0.127	23.55	1.500
SB-125	927.37	463.81	48.	29.	0.014	109.02	1.500s
TL-208	1022.82	511.52	70.	120.	0.060	49.32	2.054s
TL-208	1167.92	584.04	41.	186.	0.093	29.04	1.354s
BI-214	1220.07	610.11	48.	174.	0.087	30.75	1.298
BI-212	1457.28	728.66	25.	25.	0.012	105.46	1.554s
CS-134	1593.12	796.55	29.	24.	0.012	114.61	1.601s
AC-228	1825.59	912.72	18.	97.	0.048	35.56	1.679
BI-214	2240.95	1120.28	21.	31.	0.015	82.55	1.819D
K-40	2926.57	1462.83	11.	437.	0.219	14.69	2.042s

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	MDA Value pCi/gm	COMMENTS
BE-7		0.0000E+00					
			477.56	0.000E+00	&(	4.746E-01 1.34E-01	G
K-40		1.3198E+01					
			1460.75	1.320E+01	?(P	5.399E-01 6.46E-01	G
MN-54		-1.3289E-02					
			834.81	-1.329E-02	&(P	6.961E-02 2.01E-02	G
CO-57		1.2558E-03					
			122.07	1.256E-03	%(	6.050E-02 1.79E-02	G K
			136.43	-1.121E-02	%	4.332E-01 1.28E-01	G
CO-60		-6.5839E-03					
			1332.51	-6.584E-03	%(P	7.377E-02 2.04E-02	G K
			1173.23	1.055E-02	%	7.819E-02 2.22E-02	G K
Sr-85		-1.4428E-02					
			514.00	-1.443E-02	%(	6.663E-02 1.96E-02	G
Kr-85		-3.2649E+02					
			513.99	-3.265E+02	%(	1.517E+03 4.47E+02	G
Y-88		2.3433E-03					
			1836.01	2.343E-03	%(P	4.526E-02 1.09E-02	G K
			898.02	1.678E-02	% P	4.082E-02 1.21E-02	G
NB-94		-7.8207E-03					
			871.10	-7.821E-03	%(	5.552E-02 1.57E-02	G K
			702.50	1.508E-03	%	5.281E-02 1.47E-02	G K
Ag-108M		-6.1077E-03					
			722.95	-6.108E-03	&(	6.508E-02 1.85E-02	G K
			614.37	-4.961E-02	& P	8.724E-02 2.67E-02	G
			433.93	1.696E-03	&	4.392E-02 1.24E-02	G
CD-109		1.1292E+00					
			88.04	1.129E+00	%(P	2.186E+00 6.64E-01	G
SN-113		1.0708E-02					
			391.71	1.071E-02	%(	6.630E-02 1.93E-02	G K
			255.04	1.660E-01	%	2.057E+00 6.03E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	1.1360E-01						
		427.95	3.927E-02	%(P	1.336E-01	3.92E-02	G K
		600.77	-3.822E-02	% P	2.289E-01	6.50E-02	G
		636.15	-6.832E-02	% P	4.234E-01	1.21E-01	G
		463.51	3.336E-01	*(P	4.022E-01	1.28E-01	G
		176.29	2.301E-01	% P	6.737E-01	2.02E-01	G
I-131	0.0000E+00						
		364.48	0.000E+00	%(	6.998E-02	2.02E-02	G K
		636.97	-2.195E-02	%	5.991E-01	1.64E-01	G
		284.29	1.326E-01	%	7.577E-01	2.23E-01	G
CS-134	2.1812E-02						
		604.66	-5.381E-03	%(	4.935E-02	1.40E-02	G K
		795.76	5.289E-02	(	6.215E-02	2.02E-02	G
		569.29	-8.716E-02	%	3.539E-01	1.04E-01	G
		801.84	3.471E-03	% P	6.532E-01	1.80E-01	G
CS-137	1.5013E-02						
		661.62	1.501E-02	%(	5.507E-02	1.61E-02	G
CE-139	3.9782E-04						
		165.85	3.978E-04	%(P	5.346E-02	1.57E-02	G
EU-152	-3.3713E-02						
		121.78	-3.371E-02	%(P	1.806E-01	5.39E-02	G K
		344.30	2.088E-04	&	1.374E-01	3.91E-02	G
		1408.08	-5.006E-02	%	3.075E-01	8.56E-02	G
		964.00	1.670E-02	% P	4.244E-01	1.17E-01	G
		1112.07	-9.297E-02	%	5.156E-01	1.47E-01	G
		778.90	1.785E-02	% P	3.789E-01	1.04E-01	G
EU-154	9.6148E-04						
		123.10	9.615E-04	%(P	1.233E-01	3.64E-02	G K
		1274.80	-2.789E-03	&	2.272E-01	6.25E-02	G
		723.30	-8.113E-02	& P	3.154E-01	9.21E-02	G
		1004.80	3.598E-02	%	3.308E-01	9.20E-02	G
EU-155	-2.4270E-02						
		86.45	-2.427E-02	%(P	2.243E-01	6.63E-02	G K
		105.31	6.085E-02	%	2.727E-01	8.16E-02	G
HG-203	8.3084E-03						
		279.17	8.308E-03	&(P	5.088E-02	1.50E-02	G K
		72.87	-5.769E-01	&	2.295E+00	6.90E-01	G
		70.83	-1.560E+00	%	4.219E+00	1.27E+00	G
		82.50	3.722E-02	&	4.815E+00	1.43E+00	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	3.1057E-01						
		583.14	3.106E-01	@(P	5.453E-02	3.02E-02	G
		510.72	6.768E-01	+	2.338E-01	1.11E-01	G
PB-212	5.3196E-01						
		238.63	5.320E-01	(	1.167E-01	4.39E-02	G K
							Energy duplication
		77.11	6.805E-01	+	6.586E-01	2.04E-01	G
		74.81	9.076E-01	& P	1.356E+00	4.14E-01	G
PB-214	5.9801E-01						
		351.99	5.993E-01	(P	1.001E-01	4.71E-02	G K
		295.22	4.590E-01	-	2.263E-01	7.78E-02	G
							Energy duplication
		77.11	1.113E+00	+	1.077E+00	3.34E-01	G
		241.92	5.914E-01	?(	7.384E-01	2.28E-01	G
BI-212	3.6715E-01						
		727.17	3.671E-01	(	3.887E-01	1.29E-01	G K
		1620.56	-3.290E-01	% P	2.560E+00	6.90E-01	G
		785.42	-5.925E-02	& P	2.724E+00	7.52E-01	G
BI-214	5.5675E-01						
		609.32	5.658E-01	(	1.138E-01	5.81E-02	G K
		1764.51	-8.396E-02	% P	5.156E-01	1.43E-01	G
		1120.28	5.289E-01	(	4.092E-01	1.46E-01	G
RA-224	1.1913E+00						
		241.00	1.191E+00	(P	1.393E+00	4.32E-01	G
RA-226	1.5899E+00						
		185.99	1.590E+00	@(P	1.382E+00	4.35E-01	G
AC-228	6.9639E-01						
		911.07	7.212E-01	(P	1.671E-01	8.57E-02	G K
		968.90	4.371E-03	% P	3.523E-01	9.64E-02	G
		338.40	6.365E-01	(	3.277E-01	1.15E-01	G
TH-227	-4.0158E-02						
		236.00	-4.016E-02	%(P	4.628E-01	1.37E-01	G K
		256.25	9.622E-02	%	6.586E-01	1.94E-01	G
PA-234	4.4383E-04						
		98.44	4.438E-04	&(	2.814E-01	8.35E-02	G K
		946.00	-5.152E-02	%	3.239E-01	9.23E-02	G
		131.28	5.576E-02	%	2.497E-01	7.47E-02	G
		94.67	-1.080E-01	%	5.039E-01	1.51E-01	G
		883.24	-7.142E-02	%	5.106E-01	1.45E-01	G
		926.70	-9.499E-02	&	6.363E-01	1.82E-01	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26-1.292E-01 %   5.244E-01 1.54E-01 G

TH-234       2.4999E+00
                           63.29 2.763E+00 %(P 5.172E+00 1.57E+00 G K
                           92.80 2.157E+00  (  2.597E+00 8.00E-01 G
                           92.38 2.318E-01 % P 3.022E+00 8.99E-01 G

AM-241      -7.3031E-05
                           59.54-7.303E-05 %(  6.872E-01 2.03E-01 G
   ( - This peak used in the nuclide activity average.

   * - Peak is too wide, but only one peak in library.
   ! - Peak is part of a multiplet and this area went
       negative during deconvolution.
   ? - Peak is too narrow.
   @ - Peak is too wide at FW25M, but ok at FWHM.
   % - Peak fails sensitivity test.
   $ - Peak identified, but first peak of this nuclide
       failed one or more qualification tests.
   + - Peak activity higher than counting uncertainty range.
   - - Peak activity lower than counting uncertainty range.
   = - Peak outside analysis energy range.
   & - Calculated peak centroid is not close enough to the
       library energy centroid for positive identification.
   P - Peakbackground subtraction
   } - Peak is too close to another for the activity
       to be found directly.

   Nuclide Codes:                      Peak Codes:
   T - Thermal Neutron Activation      G - Gamma Ray
   F - Fast Neutron Activation         X - X-Ray
   I - Fission Product                 P - Positron Decay
   N - Naturally Occurring Isotope     S - Single-Escape
   P - Photon Reaction                 D - Double-Escape
   C - Charged Particle Reaction       K - Key Line
   M - No MDA Calculation              A - Not in Average
   R - Coincidence Corrected           C - Coincidence Peak
   H - Halflife limit exceeded

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
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***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	0.0000E+00	0.0000E+00	4.0324E-01	4.0324E-01	4.666E-01
K-40	#	1.3198E+01	1.3198E+01	1.9389E+00	2.0755E+00	5.399E-01
MN-54	#A	-1.3250E-02	-1.3289E-02	6.4263E-02	6.4267E-02	6.941E-02
CO-57	#B	1.2516E-03	1.2558E-03	5.3693E-02	5.3693E-02	6.030E-02
CO-60	#B	-6.5808E-03	-6.5839E-03	6.5568E-02	6.5569E-02	7.373E-02

Sr-85	#A	-1.4226E-02	-1.4428E-02	5.8908E-02	5.8914E-02	6.570E-02
Kr-85	#A	-3.2648E+02	-3.2649E+02	1.3406E+03	1.3407E+03	1.517E+03
Y-88	#B	2.3233E-03	2.3433E-03	3.2640E-02	3.2640E-02	4.488E-02
NB-94	#B	-7.8207E-03	-7.8207E-03	4.7004E-02	4.7006E-02	5.552E-02
Ag-108M	#B	-6.1075E-03	-6.1077E-03	5.5430E-02	5.5431E-02	6.508E-02
CD-109	#A	1.1270E+00	1.1292E+00	1.9908E+00	1.9918E+00	2.181E+00
SN-113	#B	1.0624E-02	1.0708E-02	5.7883E-02	5.7886E-02	6.578E-02
SB-125	#B	1.1350E-01	1.1360E-01	1.3046E-01	1.3061E-01	1.334E-01
I-131	#B	0.0000E+00	0.0000E+00	6.0635E-02	6.0635E-02	6.249E-02
CS-134	#B	2.1785E-02	2.1812E-02	2.4998E-02	2.5027E-02	4.929E-02
CS-137	#A	1.5011E-02	1.5013E-02	4.8179E-02	4.8186E-02	5.507E-02
CE-139	#A	3.9519E-04	3.9782E-04	4.7134E-02	4.7134E-02	5.311E-02
EU-152	#B	-3.3706E-02	-3.3713E-02	1.7674E-01	1.7675E-01	1.806E-01
EU-154	#B	9.6120E-04	9.6148E-04	1.0920E-01	1.0920E-01	1.232E-01
EU-155	#B	-2.4258E-02	-2.4270E-02	4.0320E-01	4.0320E-01	2.242E-01
HG-203	#B	8.1475E-03	8.3084E-03	4.4891E-02	4.4893E-02	4.990E-02
TL-208	#	3.1057E-01	3.1057E-01	9.0393E-02	9.2057E-02	
PB-212	#	5.3196E-01	5.3196E-01	1.3181E-01	1.3515E-01	1.167E-01
PB-214	#	5.9801E-01	5.9801E-01	1.4102E-01	1.4495E-01	1.001E-01
BI-212	#A	3.6715E-01	3.6715E-01	3.8718E-01	3.8773E-01	3.887E-01
BI-214		5.5675E-01	5.5675E-01	1.7118E-01	1.7401E-01	
RA-224	#A	1.1913E+00	1.1913E+00	1.2952E+00	1.2969E+00	1.393E+00
RA-226	#	1.5899E+00	1.5899E+00	1.3049E+00	1.3079E+00	1.382E+00
AC-228		6.9639E-01	6.9639E-01	2.2598E-01	2.2933E-01	1.671E-01
TH-227	#B	-4.0158E-02	-4.0158E-02	4.4299E-01	4.4300E-01	4.628E-01
PA-234	#B	4.4383E-04	4.4383E-04	2.5037E-01	2.5037E-01	2.814E-01
TH-234	#B	2.4999E+00	2.4999E+00	2.5466E+00	2.5504E+00	5.172E+00
AM-241	#A	-7.3030E-05	-7.3031E-05	6.0901E-01	6.0901E-01	6.871E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (1460.5 to 1999.0 keV) 1.5637035E+00 pCi/gm
Total Decayed Activity (1460.5 to 1999.0 keV) 1.5637035E+00 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JJM

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 102F_13SEPT2006_1553.An1

Sample description
FSS-OOL-05-08-007-F

Spectrum Filename: C:\GammaVision\Spectra\102F_13SEPT2006_1553.An1

Acquisition information

Start time:	13-Sep-2006 15:53:29
Live time:	2000
Real time:	2019
Dead time:	0.96 %
Detector ID:	3

Detector system
Det 102 - DSPP-468

Calibration

Filename:	D2_1LSa.Clb

DET 102 1 Liter Sand Geometry

Energy Calibration

Created:	15-Jan-2005 03:09:29
Zero offset:	0.220 keV
Gain:	0.500 keV/channel
Quadratic:	-6.435E-08 keV/channel^2

Efficiency Calibration

Created:	15-Jan-2005 06:48:10
Type:	Polynomial
Uncertainty:	0.497 %
Coefficients:	-0.294180 -5.980622 0.744607
	-0.096737 0.005214 -0.000120

Library Files

Main analysis library:	FSS_Rev_1.Lib
Library Match Width:	1.000
Peak stripping:	Library based

Analysis parameters

Analysis engine:	Env32 G53W4.20
Start channel:	100 (50.22keV)
Stop channel:	4000 (1999.02keV)
Peak rejection level:	41.667%
Peak search sensitivity:	3
Sample Size:	1.9350E+03
Activity scaling factor:	1.0000E+06/(1.0000E+00* 1.9350E+03) = 5.1680E+02
Detection limit method:	Nureg 4.16
Random error:	1.0000000E+00
Systematic error:	1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	09-Sep-2006 08:00:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	102_150K_28APR05.Pbc 01-May-2005 05:27:47
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 12 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.5203

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
75.05	134.	31.06	1.50	8.847E-03				
75.05	134.	31.06	1.50	8.847E-03	74.81	9.600	PBC<MDA	PB212
77.06	165.	25.08	1.50	9.541E-03	77.11	10.700	1.127E+00	PB214
					77.11	17.500	6.890E-01	PB212
77.06	165.	25.08	1.50	9.541E-03	77.11	10.700	1.127E+00	PB214
					77.11	17.500	6.890E-01	PB212
93.79	99.	35.84	1.14	1.352E-02	92.80	3.000	1.736E+00	TH234
					94.67	15.500	3.273E-01	PA234
185.49	132.	24.52	1.11	1.629E-02				
185.49	132.	24.52	1.11	1.629E-02	185.99	3.280	1.669E+00	RA226
209.30	66.	33.51	1.49	1.519E-02				
239.04	578.	4.89	1.22	1.379E-02	238.63	43.100	6.789E-01	PB212
242.20	87.	22.64	1.22	1.364E-02	241.00	3.900	PBC<MDA	RA224
					241.92	7.470	5.977E-01	PB214
295.54	136.	13.98	1.10	1.145E-02	295.22	19.200	4.321E-01	PB214
301.20	61.	33.38	1.16	1.125E-02				
338.79	123.	18.26	1.18	1.005E-02	338.40	12.010	7.121E-01	AC228
352.31	217.	10.71	1.52	9.670E-03	351.99	37.100	4.209E-01	PB214
511.14	100.	18.26	1.50	6.689E-03	510.72	22.500	4.659E-01	TL208
584.11	174.	9.20	1.57	5.881E-03	583.14	86.000	2.391E-01	TL208
610.43	148.	11.51	1.51	5.640E-03	609.32	46.090	3.959E-01	BI214
728.09	49.	29.22	1.47	4.789E-03	727.17	11.800	6.049E-01	BI212
912.79	139.	12.64	1.92	3.915E-03	911.07	29.000	8.533E-01	AC228
970.53	43.	24.51	1.72	3.718E-03	968.90	17.460	4.640E-01	AC228
1121.82	31.	32.85	1.82	3.283E-03	1120.28	15.040	4.316E-01	BI214
1462.91	453.	4.78	1.96	2.617E-03	1460.75	10.700	1.129E+01	K40
1767.39	17.	26.93	2.24	2.225E-03	1764.51	15.920	3.387E-01	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
187.16	93.79	532.	99.	0.050	107.51	1.139	TH-227	l
418.22	209.30	200.	66.	0.033	100.53	1.492	AC-228	sM
477.71	239.02	111.	578.	0.289	14.67	1.215	PB-212	D
484.04	242.18	152.	87.	0.044	67.93	1.217	PB-214	D
602.07	301.20	136.	61.	0.031	100.14	1.163	PB-212	sM

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.
M - Peak is close to a library peak.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-212	149.67	75.05	835.	134.	0.067	93.18	1.500s
PB-214	153.80	77.11	771.	165.	0.082	75.24	1.500D
PB-212	153.80	77.11	771.	165.	0.082	75.24	1.500D
RA-226	371.82	186.11	409.	79.	0.040	107.15	1.500s
PB-212	477.74	239.05	322.	496.	0.248	20.40	1.500s
RA-224	483.16	241.77	337.	83.	0.042	97.98	1.500
PB-214	591.12	295.73	150.	142.	0.071	44.36	1.500
AC-228	677.61	338.97	131.	111.	0.056	52.22	1.500
PB-214	704.70	352.51	121.	198.	0.099	31.70	1.500
TL-208	1022.01	511.11	68.	104.	0.052	53.59	1.509s
TL-208	1168.05	584.11	38.	173.	0.087	27.60	1.574
BI-214	1220.72	610.43	50.	148.	0.074	34.54	1.513s
BI-212	1456.14	728.09	52.	49.	0.024	87.66	1.466
AC-228	1825.36	912.61	27.	116.	0.058	33.81	1.679
AC-228	1941.27	970.53	34.	43.	0.022	73.52	1.718
BI-214	2244.03	1121.82	35.	31.	0.015	98.56	1.819s
K-40	2926.80	1462.94	10.	440.	0.220	14.61	2.042
BI-214	3536.24	1767.39	2.	17.	0.009	80.79	2.236s

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	MDA Value pCi/gm	COMMENTS
BE-7		1.2369E-01					
			477.56	1.237E-01	%(	3.291E-01 9.82E-02	G
K-40		1.0957E+01					
			1460.75	1.096E+01	(P	4.321E-01 5.34E-01	G
MN-54		-5.4803E-03					
			834.81	-5.480E-03	&(P	5.235E-02 1.48E-02	G
CO-57		-1.0976E-02					
			122.07	-1.098E-02	%(	5.529E-02 1.65E-02	G K
			136.43	-2.335E-03	%	4.043E-01 1.20E-01	G
CO-60		-7.9855E-03					
			1332.51	-7.985E-03	%(P	6.032E-02 1.68E-02	G K
			1173.23	-1.322E-02	&	7.850E-02 2.27E-02	G K
Sr-85		-1.5087E-02					
			514.00	-1.509E-02	%(	5.395E-02 1.60E-02	G
Kr-85		-3.3252E+02					
			513.99	-3.325E+02	%(	1.189E+03 3.53E+02	G
Y-88		-9.9859E-03					
			1836.01	-9.986E-03	%(P	6.396E-02 1.76E-02	G K
			898.02	6.588E-03	& P	4.748E-02 1.32E-02	G
NB-94		-3.1360E-03					
			871.10	-3.136E-03	%(	4.557E-02 1.26E-02	G K
			702.50	6.934E-03	%	5.252E-02 1.51E-02	G K
Ag-108M		-4.2724E-04					
			722.95	-4.272E-04	&(	5.762E-02 1.62E-02	G K
			614.37	-2.139E-02	% P	6.340E-02 1.89E-02	G
			433.93	9.962E-03	%	3.583E-02 1.05E-02	G
CD-109		1.0566E+00					
			88.04	1.057E+00	%(P	1.985E+00 6.03E-01	G
SN-113		1.3477E-02					
			391.71	1.348E-02	%(	4.600E-02 1.36E-02	G K
			255.04	1.282E-01	&	1.977E+00 5.81E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	3.4943E-02						
		427.95	3.494E-02	%(P	1.259E-01	3.71E-02	G K
		600.77	-9.287E-04	% P	2.297E-01	6.41E-02	G
		636.15	1.091E-01	% P	3.340E-01	9.84E-02	G
		463.51	1.879E-01	% P	3.470E-01	1.06E-01	G
		176.29	-1.030E-01	% P	5.714E-01	1.69E-01	G
I-131	1.2459E-02						
		364.48	1.246E-02	&(	6.767E-02	1.99E-02	G K
		636.97	1.022E-01	%	8.019E-01	2.28E-01	G
		284.29	-8.815E-02	&	9.713E-01	2.85E-01	G
CS-134	-1.4223E-02						
		604.66	-1.422E-02	&(	4.948E-02	1.46E-02	G K
		795.76	2.995E-02	%	5.083E-02	1.58E-02	G
		569.29	0.000E+00	%	3.406E-01	9.72E-02	G
		801.84	-9.621E-02	% P	5.208E-01	1.49E-01	G
CS-137	5.1223E-03						
		661.62	5.122E-03	%(	5.148E-02	1.46E-02	G
CE-139	-6.8481E-03						
		165.85	-6.848E-03	%(P	5.451E-02	1.62E-02	G
EU-152	-3.6086E-02						
		121.78	-3.609E-02	%(P	1.661E-01	4.97E-02	G K
		344.30	0.000E+00	%	1.758E-01	5.12E-02	G
		1408.08	3.565E-03	&	2.644E-01	7.05E-02	G
		964.00	-3.404E-02	& P	4.354E-01	1.23E-01	G
		1112.07	0.000E+00	&	5.683E-01	1.60E-01	G
		778.90	2.307E-02	% P	3.646E-01	1.02E-01	G
EU-154	-2.1023E-04						
		123.10	-2.102E-04	%(P	1.172E-01	3.47E-02	G K
		1274.80	1.042E-02	%	1.875E-01	5.21E-02	G
		723.30	-3.554E-02	& P	2.888E-01	8.30E-02	G
		1004.80	-7.105E-04	%	2.761E-01	7.48E-02	G
EU-155	1.0064E-01						
		86.45	1.006E-01	%(P	2.418E-01	7.31E-02	G K
		105.31	3.543E-02	%	2.485E-01	7.42E-02	G
HG-203	5.6441E-04						
		279.17	5.644E-04	%(P	4.623E-02	1.34E-02	G K
		72.87	-8.068E-01	&	1.568E+00	4.76E-01	G
		70.83	-1.490E-01	%	4.366E+00	1.30E+00	G
		82.50	-5.432E-02	%	3.802E+00	1.13E+00	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	2.3906E-01						
		583.14	2.391E-01	(P	4.314E-02	2.21E-02	G
		510.72	4.840E-01	+	1.902E-01	8.65E-02	G
PB-212	6.1343E-01						
		238.63	5.827E-01	@(	1.013E-01	3.96E-02	G K
							Energy duplication
		77.11	6.890E-01	*(	5.526E-01	1.73E-01	G
		74.81	1.099E+00	+ P	1.130E+00	3.49E-01	G
PB-214	4.0736E-01						
		351.99	3.849E-01	(P	1.048E-01	4.07E-02	G K
		295.22	4.507E-01	(	1.895E-01	6.67E-02	G
							Energy duplication
		77.11	1.127E+00	+	9.038E-01	2.83E-01	G
		241.92	4.229E-01	%	6.615E-01	2.02E-01	G
BI-212	6.0492E-01						
		727.17	6.049E-01	(	4.483E-01	1.77E-01	G K
		1620.56	-3.555E-02	% P	3.148E+00	8.64E-01	G
		785.42	-5.642E-02	% P	2.657E+00	7.45E-01	G
BI-214	3.9104E-01						
		609.32	3.959E-01	@(	9.600E-02	4.57E-02	G K
		1764.51	3.387E-01	&(P	1.917E-01	9.17E-02	G
		1120.28	4.316E-01	&(	4.283E-01	1.42E-01	G
RA-224	1.0853E+00						
		241.00	1.085E+00	(P	1.154E+00	3.59E-01	G
RA-226	1.0369E+00						
		185.99	1.037E+00	*(P	1.269E+00	3.91E-01	G
AC-228	6.8977E-01						
		911.07	7.097E-01	(P	1.666E-01	8.01E-02	G K
		968.90	4.640E-01	- P	3.232E-01	1.14E-01	G
		338.40	6.417E-01	(	3.242E-01	1.12E-01	G
TH-227	-4.5274E-03						
		236.00	-4.527E-03	&(P	3.461E-01	1.01E-01	G K
		256.25	0.000E+00	&	5.776E-01	1.69E-01	G
PA-234	6.6680E-03						
		98.44	6.668E-03	%(	2.459E-01	7.31E-02	G K
		946.00	2.172E-02	%	2.208E-01	6.11E-02	G
		131.28	1.066E-01	&	2.227E-01	6.75E-02	G
		94.67	3.505E-03	%	4.419E-01	1.31E-01	G
		883.24	-4.460E-02	%	4.091E-01	1.15E-01	G
		926.70	2.789E-03	%	3.815E-01	1.02E-01	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26 0.000E+00 %   5.032E-01 1.44E-01 G

TH-234       9.2841E-01
                           63.29 9.284E-01 &(P 4.512E+00 1.35E+00 G K
                           92.80 1.557E+00 %   2.386E+00 7.29E-01 G
                           92.38-7.906E-01 & P 2.436E+00 7.33E-01 G

AM-241      -5.2560E-02
                           59.54-5.256E-02 &(  6.561E-01 1.95E-01 G
   ( - This peak used in the nuclide activity average.

   * - Peak is too wide, but only one peak in library.
   ! - Peak is part of a multiplet and this area went
       negative during deconvolution.
   ? - Peak is too narrow.
   @ - Peak is too wide at FW25M, but ok at FWHM.
   % - Peak fails sensitivity test.
   $ - Peak identified, but first peak of this nuclide
       failed one or more qualification tests.
   + - Peak activity higher than counting uncertainty range.
   - - Peak activity lower than counting uncertainty range.
   = - Peak outside analysis energy range.
   & - Calculated peak centroid is not close enough to the
       library energy centroid for positive identification.
   P - Peakbackground subtraction
   } - Peak is too close to another for the activity
       to be found directly.

   Nuclide Codes:                      Peak Codes:
   T - Thermal Neutron Activation      G - Gamma Ray
   F - Fast Neutron Activation         X - X-Ray
   I - Fission Product                 P - Positron Decay
   N - Naturally Occurring Isotope     S - Single-Escape
   P - Photon Reaction                 D - Double-Escape
   C - Charged Particle Reaction       K - Key Line
   M - No MDA Calculation              A - Not in Average
   R - Coincidence Corrected           C - Coincidence Peak
   H - Halflife limit exceeded

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
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***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	1.1693E-01	1.2369E-01	2.9451E-01	2.9460E-01	3.111E-01
K-40		1.0957E+01	1.0957E+01	1.6016E+00	1.7156E+00	4.321E-01
MN-54	#A	-5.4279E-03	-5.4803E-03	5.0447E-02	5.0448E-02	5.185E-02
CO-57	#B	-1.0855E-02	-1.0976E-02	4.9623E-02	4.9626E-02	5.468E-02
CO-60	#B	-7.9730E-03	-7.9855E-03	5.2975E-02	5.2977E-02	6.023E-02

Sr-85	#A	-1.4404E-02	-1.5087E-02	4.7978E-02	4.7985E-02	5.151E-02
Kr-85	#A	-3.3251E+02	-3.3252E+02	1.0575E+03	1.0577E+03	1.189E+03
Y-88	#B	-9.7088E-03	-9.9859E-03	5.3082E-02	5.3085E-02	6.218E-02
NB-94	#B	-3.1360E-03	-3.1360E-03	3.7907E-02	3.7907E-02	4.557E-02
Ag-108M	#B	-4.2721E-04	-4.2724E-04	4.8572E-02	4.8572E-02	5.762E-02
CD-109	#A	1.0496E+00	1.0566E+00	1.8092E+00	1.8101E+00	1.972E+00
SN-113	#B	1.3130E-02	1.3477E-02	4.0671E-02	4.0678E-02	4.481E-02
SB-125	#B	3.4840E-02	3.4943E-02	1.1123E-01	1.1125E-01	1.256E-01
I-131	#B	8.5781E-03	1.2459E-02	5.9584E-02	5.9588E-02	4.659E-02
CS-134	#B	-1.4167E-02	-1.4223E-02	4.3816E-02	4.3824E-02	4.928E-02
CS-137	#A	5.1209E-03	5.1223E-03	4.3809E-02	4.3810E-02	5.146E-02
CE-139	#A	-6.7003E-03	-6.8481E-03	5.1998E-02	5.1999E-02	5.333E-02
EU-152	#B	-3.6062E-02	-3.6086E-02	1.5976E-01	1.5977E-01	1.660E-01
EU-154	#B	-2.1002E-04	-2.1023E-04	4.2785E-02	4.2785E-02	1.171E-01
EU-155	#B	1.0048E-01	1.0064E-01	2.1923E-01	2.1930E-01	2.414E-01
HG-203	#B	5.2921E-04	5.6441E-04	4.0263E-02	4.0263E-02	4.335E-02
TL-208		2.3906E-01	2.3906E-01	6.6132E-02	6.7479E-02	
PB-212	#	6.1343E-01	6.1343E-01	1.2515E-01	1.2980E-01	1.013E-01
PB-214	#	4.0736E-01	4.0736E-01	1.1112E-01	1.1345E-01	1.048E-01
BI-212		6.0492E-01	6.0492E-01	5.3027E-01	5.3136E-01	
BI-214		3.9104E-01	3.9104E-01	1.3505E-01	1.3682E-01	
RA-224	#A	1.0853E+00	1.0853E+00	1.0782E+00	1.0799E+00	1.154E+00
RA-226	#A	1.0369E+00	1.0369E+00	1.1736E+00	1.1751E+00	1.269E+00
AC-228		6.8977E-01	6.8977E-01	2.1467E-01	2.1813E-01	1.666E-01
TH-227	#B	-4.5274E-03	-4.5274E-03	5.4323E-01	5.4323E-01	3.461E-01
PA-234	#B	6.6680E-03	6.6680E-03	2.1937E-01	2.1937E-01	2.459E-01
TH-234	#B	9.2841E-01	9.2841E-01	4.0547E+00	4.0550E+00	4.512E+00
AM-241	#A	-5.2559E-02	-5.2560E-02	5.8587E-01	5.8588E-01	6.561E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (270.2 to 1999.0 keV) 1.2881329E+01 pCi/gm
Total Decayed Activity (270.2 to 1999.0 keV) 1.2881329E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JJM

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 102F_13SEPT2006_1703.An1

Sample description
FSS-OOL-05-08-011-F

Spectrum Filename: C:\GammaVision\Spectra\102F_13SEPT2006_1703.An1

Acquisition information
Start time: 13-Sep-2006 17:03:26
Live time: 2000
Real time: 2018
Dead time: 0.91 %
Detector ID: 3

Detector system
Det 102 - DSPP-468

Calibration
Filename: D2_1LSa.Clb
DET 102 1 Liter Sand Geometry

Energy Calibration
Created: 15-Jan-2005 03:09:29
Zero offset: 0.220 keV
Gain: 0.500 keV/channel
Quadratic: -6.435E-08 keV/channel^2

Efficiency Calibration
Created: 15-Jan-2005 06:48:10
Type: Polynomial
Uncertainty: 0.497 %
Coefficients: -0.294180 -5.980622 0.744607
-0.096737 0.005214 -0.000120

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.22keV)
Stop channel: 4000 (1999.02keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 1.6790E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.6790E+03) =
5.9559E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	11-Sep-2006 13:10:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	102_150K_28APR05.Pbc 01-May-2005 05:27:47
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 12 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.7430

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
77.04	139.	29.30	1.50	9.541E-03	77.11	10.700	1.092E+00	PB214
					77.11	17.500	6.676E-01	PB212
77.04	139.	29.30	1.50	9.541E-03	77.11	10.700	1.092E+00	PB214
					77.11	17.500	6.676E-01	PB212
186.21	133.	24.27	0.80	1.626E-02	185.99	3.280	1.942E+00	RA226
209.77	73.	32.60	1.63	1.517E-02				
239.06	490.	5.52	1.22	1.379E-02	238.63	43.100	6.629E-01	PB212
242.24	80.	24.50	1.22	1.364E-02	241.00	3.900	PBC<MDA	RA224
					241.92	7.470	6.297E-01	PB214
270.57	80.	31.40	0.97	1.241E-02				
295.79	147.	10.91	1.26	1.145E-02	295.22	19.200	5.380E-01	PB214
301.08	39.	33.56	1.26	1.126E-02				
329.21	71.	28.23	1.91	1.033E-02				
338.86	112.	18.78	1.52	1.005E-02	338.40	12.010	7.461E-01	AC228
352.34	236.	10.34	1.35	9.669E-03	351.99	37.100	5.277E-01	PB214
439.81	34.	36.98	0.99	7.758E-03				
511.71	76.	18.31	1.39	6.682E-03	510.72	22.500	4.061E-01	TL208
584.02	134.	12.30	1.60	5.882E-03	583.14	86.000	2.123E-01	TL208
610.17	162.	11.32	1.35	5.642E-03	609.32	46.090	5.011E-01	BI214
662.84	32.	34.52	0.76	5.221E-03				
728.22	48.	23.61	1.22	4.788E-03	727.17	11.800	6.900E-01	BI212
912.67	127.	11.10	1.69	3.916E-03	911.07	29.000	8.964E-01	AC228
969.85	92.	14.85	1.56	3.715E-03	968.90	17.460	1.146E+00	AC228
1121.92	46.	30.59	1.15	3.279E-03				
1463.01	451.	4.83	1.81	2.617E-03	1460.75	10.700	1.294E+01	K40

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide
419.16	209.77	216.	73.	0.037	97.81	1.625	NP-239 s
477.75	239.01	121.	490.	0.245	16.56	1.215	PB-212 D

Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM	Suspected	
484.10	242.18	151.	80.	0.040	73.50	1.217	PB-214	D
540.79	270.57	190.	80.	0.040	94.20	0.967	AC-228	s
601.43	300.89	80.	49.	0.024	92.69	1.435	PB-212	s
658.09	329.21	114.	71.	0.036	84.68	1.912	LA-140	s
1325.58	662.84	37.	31.	0.016	98.24	0.763	CE-143	s
2244.57	1121.92	27.	35.	0.018	80.23	1.820	TA-182	D

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-214	153.80	77.11	754.	139.	0.069	87.90	1.500D
PB-212	153.80	77.11	754.	139.	0.069	87.90	1.500D
RA-226	372.16	186.28	350.	80.	0.040	99.04	1.500s
PB-212	477.75	239.06	383.	424.	0.212	24.41	1.500s
PB-214	591.12	295.73	122.	117.	0.059	48.67	1.500
AC-228	677.40	338.86	114.	112.	0.056	56.35	1.518s
PB-214	704.58	352.45	105.	207.	0.103	29.54	1.500s
TL-208	1023.21	511.71	49.	76.	0.038	54.92	1.391s
TL-208	1167.87	584.02	51.	134.	0.067	36.90	1.596
BI-214	1220.19	610.17	53.	162.	0.081	33.96	1.351s
Ag-108M	1224.36	612.25	115.	-40.	-0.020	123.94	1.499s
BI-212	1456.40	728.22	28.	48.	0.024	70.84	1.220
AC-228	1825.48	912.67	23.	127.	0.063	33.31	1.691
AC-228	1939.90	969.85	28.	92.	0.046	44.56	1.558s
K-40	2927.01	1463.05	10.	395.	0.197	15.48	2.042

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	Peak MDA Value pCi/gm	COMMENTS
BE-7		1.2064E-01					
			477.56	1.206E-01	&(	4.257E-01 1.25E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
K-40	1.1331E+01						
		1460.75	1.133E+01	(P	5.095E-01	5.85E-01	G
MN-54	-4.8279E-04						
		834.81	-4.828E-04	&(P	5.644E-02	1.55E-02	G
CO-57	-4.3153E-03						
		122.07	-4.315E-03	&(	5.765E-02	1.71E-02	G K
		136.43	-6.758E-03	&	3.955E-01	1.17E-01	G
CO-60	1.1434E-02						
		1332.51	1.143E-02	%(P	5.877E-02	1.65E-02	G K
		1173.23	-7.886E-03	&	8.936E-02	2.54E-02	G K
Sr-85	-1.9080E-02						
		514.00	-1.908E-02	%(	6.226E-02	1.85E-02	G
Kr-85	-4.3041E+02						
		513.99	-4.304E+02	%(	1.404E+03	4.18E+02	G
Y-88	-2.5096E-05						
		1836.01	-2.510E-05	%(P	2.818E-02	3.82E-03	G K
		898.02	1.068E-02	% P	6.644E-02	1.89E-02	G
NB-94	1.2973E-03						
		871.10	1.297E-03	%(	5.442E-02	1.50E-02	G K
		702.50	1.126E-03	%	4.864E-02	1.35E-02	G K
Ag-108M	-1.0903E-02						
		722.95	-1.090E-02	%(	6.272E-02	1.81E-02	G K
		614.37	-6.345E-02	+ P	8.374E-02	2.61E-02	G
		433.93	8.916E-03	%	5.035E-02	1.47E-02	G
CD-109	7.4007E-01						
		88.04	7.401E-01	%(P	2.069E+00	6.24E-01	G
SN-113	-1.2539E-02						
		391.71	-1.254E-02	%(	7.881E-02	2.31E-02	G K
		255.04	-1.010E-01	&	2.127E+00	6.23E-01	G
SB-125	1.3755E-03						
		427.95	1.375E-03	&(P	1.188E-01	3.31E-02	G K
		600.77	-4.757E-02	& P	2.778E-01	8.02E-02	G
		636.15	-1.932E-02	% P	4.097E-01	1.14E-01	G
		463.51	3.143E-01	% P	4.507E-01	1.40E-01	G
		176.29	-4.273E-02	% P	7.184E-01	2.11E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
I-131	1.6165E-02						
		364.48	1.617E-02	&(	5.956E-02	1.76E-02	G K
		636.97	1.673E-01	&	6.995E-01	2.02E-01	G
		284.29	-1.342E-01	&	8.053E-01	2.37E-01	G
CS-134	1.2839E-02						
		604.66	1.284E-02	%(	5.232E-02	1.53E-02	G K
		795.76	2.563E-02	%	6.475E-02	1.94E-02	G
		569.29	-8.378E-03	%	2.670E-01	7.44E-02	G
		801.84	-1.144E-02	% P	6.216E-01	1.72E-01	G
CS-137	1.3554E-03						
		661.62	1.355E-03	%(	6.327E-02	1.78E-02	G
CE-139	9.9399E-03						
		165.85	9.940E-03	%(P	5.372E-02	1.60E-02	G
EU-152	-1.5379E-02						
		121.78	-1.538E-02	&(P	1.439E-01	4.25E-02	G K
		344.30	3.209E-03	%	1.837E-01	5.34E-02	G
		1408.08	-3.785E-02	&	2.965E-01	8.18E-02	G
		964.00	-1.029E-01	& P	5.441E-01	1.57E-01	G
		1112.07	2.578E-02	%	4.183E-01	1.14E-01	G
		778.90	-3.349E-02	& P	4.687E-01	1.33E-01	G
EU-154	-7.9148E-04						
		123.10	-7.915E-04	%(P	1.237E-01	3.66E-02	G K
		1274.80	1.416E-02	%	1.918E-01	5.29E-02	G
		723.30	-6.618E-02	% P	2.964E-01	8.60E-02	G
		1004.80	1.167E-01	%	2.757E-01	8.27E-02	G
EU-155	-1.8756E-02						
		86.45	-1.876E-02	%(P	2.845E-01	8.46E-02	G K
		105.31	8.496E-02	%	2.612E-01	7.86E-02	G
HG-203	8.2107E-04						
		279.17	8.211E-04	%(P	4.951E-02	1.44E-02	G K
		72.87	-4.620E-01	%	2.069E+00	6.21E-01	G
		70.83	-1.385E+00	%	4.144E+00	1.25E+00	G
		82.50	-8.999E-01	%	4.335E+00	1.30E+00	G
TL-208	2.1227E-01						
		583.14	2.123E-01	(P	5.739E-02	2.62E-02	G
		510.72	4.061E-01	+	1.888E-01	7.45E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
PB-212	6.0064E-01						
		238.63	5.734E-01	@(	1.270E-01	4.67E-02	G K
							Energy duplication
		77.11	6.676E-01	*(	6.300E-01	1.96E-01	G
		74.81	8.821E-01	& P	1.274E+00	3.89E-01	G
PB-214	4.5147E-01						
		351.99	4.632E-01	@(P	1.130E-01	4.57E-02	G K
		295.22	4.288E-01	(	1.984E-01	6.96E-02	G
							Energy duplication
		77.11	1.092E+00	+	1.030E+00	3.20E-01	G
		241.92	3.886E-01	%	7.812E-01	2.37E-01	G
BI-212	6.9004E-01						
		727.17	6.900E-01	(	3.925E-01	1.63E-01	G K
		1620.56	-4.097E-02	& P	8.999E-01	1.22E-01	G
		785.42	-3.292E-01	% P	2.880E+00	8.18E-01	G
BI-214	5.0107E-01						
		609.32	5.011E-01	@(	1.131E-01	5.68E-02	G K
		1764.51	-1.139E-01	% P	5.318E-01	1.51E-01	G
		1120.28	-1.319E-02	%	5.174E-01	1.44E-01	G
RA-224	8.0518E-01						
		241.00	8.052E-01	%(P	1.509E+00	4.59E-01	G
RA-226	1.2051E+00						
		185.99	1.205E+00	*(P	1.356E+00	4.20E-01	G
AC-228	9.9037E-01						
		911.07	8.964E-01	(P	1.785E-01	9.97E-02	G K
		968.90	1.146E+00	@(P	3.368E-01	1.70E-01	G
		338.40	7.461E-01	-	3.495E-01	1.40E-01	G
TH-227	-1.3727E-01						
		236.00	-1.373E-01	%(P	5.339E-01	1.60E-01	G K
		256.25	2.277E-01	&	4.997E-01	1.51E-01	G
PA-234	4.8071E-03						
		98.44	4.807E-03	%(	2.584E-01	7.66E-02	G K
		946.00	-5.591E-02	%	2.929E-01	8.38E-02	G
		131.28	2.790E-02	&	2.236E-01	6.64E-02	G
		94.67	-9.962E-02	%	4.661E-01	1.40E-01	G
		883.24	-6.786E-02	%	4.683E-01	1.33E-01	G
		926.70	-5.034E-03	%	4.654E-01	1.26E-01	G
		569.26	-1.251E-02	%	3.954E-01	1.10E-01	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments

TH-234      -5.6241E-01
                           63.29-5.624E-01 &(P 5.043E+00 1.50E+00 G K
                           92.80 1.642E+00 %   2.536E+00 7.75E-01 G
                           92.38 1.951E+00 % P 2.901E+00 8.87E-01 G

AM-241      -1.1355E-01
                           59.54-1.135E-01 %(  7.417E-01 2.21E-01 G
   ( - This peak used in the nuclide activity average.

   * - Peak is too wide, but only one peak in library.
   ! - Peak is part of a multiplet and this area went
       negative during deconvolution.
   ? - Peak is too narrow.
   @ - Peak is too wide at FW25M, but ok at FWHM.
   % - Peak fails sensitivity test.
   $ - Peak identified, but first peak of this nuclide
       failed one or more qualification tests.
   + - Peak activity higher than counting uncertainty range.
   - - Peak activity lower than counting uncertainty range.
   = - Peak outside analysis energy range.
   & - Calculated peak centroid is not close enough to the
       library energy centroid for positive identification.
   P - Peakbackground subtraction
   } - Peak is too close to another for the activity
       to be found directly.

   Nuclide Codes:                      Peak Codes:
   T - Thermal Neutron Activation      G - Gamma Ray
   F - Fast Neutron Activation         X - X-Ray
   I - Fission Product                 P - Positron Decay
   N - Naturally Occurring Isotope     S - Single-Escape
   P - Photon Reaction                 D - Double-Escape
   C - Charged Particle Reaction       K - Key Line
   M - No MDA Calculation              A - Not in Average
   R - Coincidence Corrected           C - Coincidence Peak
   H - Halflife limit exceeded

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
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***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	1.1730E-01	1.2064E-01	3.7644E-01	3.7650E-01	4.139E-01
K-40		1.1331E+01	1.1331E+01	1.7551E+00	1.8667E+00	5.095E-01
MN-54	#A	-4.8047E-04	-4.8279E-04	5.5010E-01	5.5010E-01	5.617E-02
CO-57	#B	-4.2914E-03	-4.3153E-03	5.1311E-02	5.1312E-02	5.733E-02
CO-60	#B	1.1425E-02	1.1434E-02	4.9483E-02	4.9488E-02	5.873E-02
Sr-85	#A	-1.8644E-02	-1.9080E-02	5.5566E-02	5.5577E-02	6.084E-02

Kr-85	#A	-4.3040E+02	-4.3041E+02	1.2535E+03	1.2537E+03	1.404E+03
Y-88	#B	-2.4746E-05	-2.5096E-05	1.5058E-04	1.5058E-04	2.779E-02
NB-94	#B	1.2973E-03	1.2973E-03	4.4932E-02	4.4932E-02	5.442E-02
Ag-108M	#B	-1.0903E-02	-1.0903E-02	5.4243E-02	5.4247E-02	6.272E-02
CD-109	#A	7.3763E-01	7.4007E-01	1.8712E+00	1.8716E+00	2.062E+00
SN-113	#B	-1.2377E-02	-1.2539E-02	6.9349E-02	6.9352E-02	7.779E-02
SB-125	#B	1.3734E-03	1.3755E-03	9.9386E-02	9.9386E-02	1.186E-01
I-131	#B	1.3416E-02	1.6165E-02	5.2863E-02	5.2871E-02	4.943E-02
CS-134	#B	1.2814E-02	1.2839E-02	4.5917E-02	4.5923E-02	5.222E-02
CS-137	#A	1.3552E-03	1.3554E-03	5.3320E-02	5.3320E-02	6.326E-02
CE-139	#A	9.8322E-03	9.9399E-03	4.7978E-02	4.7981E-02	5.314E-02
EU-152	#B	-1.5374E-02	-1.5379E-02	1.5392E-01	1.5392E-01	1.439E-01
EU-154	#B	-7.9110E-04	-7.9148E-04	2.0653E-01	2.0653E-01	1.237E-01
EU-155	#B	-1.8741E-02	-1.8756E-02	6.1772E-01	6.1772E-01	2.842E-01
HG-203	#B	7.9508E-04	8.2107E-04	4.3053E-02	4.3053E-02	4.794E-02
TL-208		2.1227E-01	2.1227E-01	7.8573E-02	7.9471E-02	
PB-212	#	6.0064E-01	6.0064E-01	1.4662E-01	1.5045E-01	1.270E-01
PB-214	#	4.5147E-01	4.5147E-01	1.2858E-01	1.3105E-01	1.130E-01
BI-212		6.9004E-01	6.9004E-01	4.8881E-01	4.9034E-01	
BI-214	#	5.0107E-01	5.0107E-01	1.7015E-01	1.7246E-01	
RA-224	#A	8.0518E-01	8.0518E-01	1.3759E+00	1.3766E+00	1.509E+00
RA-226	#A	1.2051E+00	1.2051E+00	1.2602E+00	1.2620E+00	1.356E+00
AC-228		9.9037E-01	9.9037E-01	2.7572E-01	2.8127E-01	
TH-227	#B	-1.3727E-01	-1.3727E-01	4.9020E-01	4.9026E-01	5.339E-01
PA-234	#B	4.8071E-03	4.8071E-03	2.2994E-01	2.2994E-01	2.584E-01
TH-234	#B	-5.6241E-01	-5.6241E-01	4.7411E+00	4.7412E+00	5.043E+00
AM-241	#A	-1.1355E-01	-1.1355E-01	6.6446E-01	6.6449E-01	7.417E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (1460.5 to 1999.0 keV) 1.3724407E+01 pCi/gm
Total Decayed Activity (1460.5 to 1999.0 keV) 1.3724407E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JJM

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 102F_13SEPT2006_1745.An1

Sample description
FSS-OOL-05-08-011-F-RC

Spectrum Filename: C:\GammaVision\Spectra\102F_13SEPT2006_1745.An1

Acquisition information
Start time: 13-Sep-2006 17:45:34
Live time: 2000
Real time: 2018
Dead time: 0.87 %
Detector ID: 3

Detector system
Det 102 - DSPP-468

Calibration
Filename: D2_1LSa.Clb
DET 102 1 Liter Sand Geometry

Energy Calibration
Created: 15-Jan-2005 03:09:29
Zero offset: 0.220 keV
Gain: 0.500 keV/channel
Quadratic: -6.435E-08 keV/channel^2

Efficiency Calibration
Created: 15-Jan-2005 06:48:10
Type: Polynomial
Uncertainty: 0.497 %
Coefficients: -0.294180 -5.980622 0.744607
-0.096737 0.005214 -0.000120

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.22keV)
Stop channel: 4000 (1999.02keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 1.6790E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.6790E+03) =
5.9559E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	11-Sep-2006 13:10:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	102_150K_28APR05.Pbc 01-May-2005 05:27:47
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 14 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.6451

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
77.28	162.	25.86	1.50	9.541E-03	77.11	17.500	7.797E-01	PB212
					77.11	10.700	1.275E+00	PB214
77.28	162.	25.86	1.50	9.541E-03	77.11	17.500	PBC<MDA	PB212
					77.11	10.700	1.275E+00	PB214
186.18	93.	32.60	1.77	1.626E-02	185.99	3.280	1.336E+00	RA226
210.03	90.	31.00	1.04	1.516E-02				
239.09	454.	5.75	1.22	1.379E-02	238.63	43.100	6.138E-01	PB212
242.17	88.	21.42	1.22	1.365E-02	241.92	7.470	6.916E-01	PB214
276.86	58.	28.22	1.36	1.216E-02				
295.75	140.	11.57	1.26	1.145E-02	295.22	19.200	5.113E-01	PB214
300.34	40.	31.75	1.26	1.128E-02				
339.01	142.	15.23	1.24	1.004E-02	338.40	12.010	9.460E-01	AC228
352.57	220.	9.37	1.23	9.663E-03	351.99	37.100	4.934E-01	PB214
463.62	42.	34.32	0.89	7.363E-03	463.51	10.000	4.384E-01	SB125
511.84	81.	19.38	1.55	6.681E-03	510.72	22.500	4.328E-01	TL208
584.01	155.	13.94	1.43	5.882E-03	583.14	86.000	2.456E-01	TL208
610.29	154.	12.29	1.20	5.641E-03	609.32	46.090	4.760E-01	BI214
662.78	39.	36.46	1.00	5.221E-03				
728.04	53.	29.70	1.44	4.789E-03	727.17	11.800	7.484E-01	BI212
912.55	82.	15.98	1.43	3.916E-03	911.07	29.000	5.815E-01	AC228
969.80	80.	17.94	1.87	3.715E-03	968.90	17.460	9.964E-01	AC228
1121.25	56.	23.45	2.94	3.283E-03	1120.28	15.040	9.047E-01	BI214
1463.03	464.	4.71	1.95	2.617E-03	1460.75	10.700	1.331E+01	K40

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

Peak Centroid	Background	Net Area	Intensity	Uncert	FWHM	Suspected

Channel	Energy	Counts	Counts	Cts/Sec	3 Sigma %	keV	Nuclide	
419.68	210.03	257.	90.	0.045	92.99	1.042	NP-239	M

Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM	Suspected	
477.81	239.03	114.	454.	0.227	17.25	1.215	PB-212	D
483.98	242.11	132.	88.	0.044	64.25	1.217	PB-214	D
600.34	300.34	63.	41.	0.021	92.76	1.393	PB-212	s
1325.46	662.78	43.	44.	0.022	77.23	1.002	CS-137	s

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.
M - Peak is close to a library peak.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-212	153.80	77.11	794.	162.	0.081	77.57	1.500D
PB-214	153.80	77.11	794.	162.	0.081	77.57	1.500D
PB-212	477.73	239.05	347.	393.	0.197	25.14	1.500
PB-214	591.21	295.78	108.	144.	0.072	39.47	1.500
AC-228	677.70	339.01	105.	142.	0.071	45.68	1.237s
PB-214	704.79	352.56	67.	201.	0.100	27.30	1.500s
SB-125	927.06	463.66	59.	30.	0.015	114.11	1.500s
TL-208	1023.46	511.84	57.	81.	0.041	58.13	1.546s
TL-208	1167.85	584.01	78.	155.	0.077	41.83	1.426
BI-214	1220.44	610.29	60.	154.	0.077	36.86	1.197
BI-212	1456.04	728.04	50.	53.	0.026	89.11	1.441
AC-228	1825.24	912.55	28.	82.	0.041	47.95	1.432
AC-228	1939.81	969.80	34.	80.	0.040	53.82	1.875
BI-214	2242.89	1121.25	34.	56.	0.028	70.34	2.941s
K-40	2927.12	1463.11	10.	438.	0.219	14.64	2.042

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	Peak MDA Value pCi/gm	COMMENTS
BE-7		-1.1968E-02					
			477.56	-1.197E-02	&(	4.933E-01 1.41E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
K-40	1.2573E+01						
		1460.75	1.257E+01	(P	4.912E-01	6.14E-01	G
MN-54	3.2374E-02						
		834.81	3.237E-02	%(P	4.856E-02	1.53E-02	G
CO-57	1.0183E-03						
		122.07	1.018E-03	%(	5.732E-02	1.69E-02	G K
		136.43	4.442E-02	%	4.577E-01	1.36E-01	G
CO-60	-4.4090E-03						
		1332.51	-4.409E-03	&(P	6.205E-02	1.68E-02	G K
		1173.23	6.457E-03	&	6.943E-02	1.94E-02	G K
Sr-85	-1.1241E-02						
		514.00	-1.124E-02	&(	6.012E-02	1.76E-02	G
Kr-85	-2.4357E+02						
		513.99	-2.436E+02	&(	1.350E+03	3.95E+02	G
Y-88	3.4242E-03						
		1836.01	3.424E-03	%(P	3.579E-02	8.52E-03	G K
		898.02	-1.327E-03	% P	7.801E-02	2.17E-02	G
NB-94	-3.5394E-03						
		871.10	-3.539E-03	&(	4.697E-02	1.29E-02	G K
		702.50	-1.129E-02	%	5.861E-02	1.70E-02	G K
Ag-108M	-4.6670E-03						
		722.95	-4.667E-03	&(	5.721E-02	1.61E-02	G K
		614.37	-3.637E-02	% P	7.539E-02	2.28E-02	G
		433.93	-4.311E-03	%	5.267E-02	1.52E-02	G
CD-109	1.2759E+00						
		88.04	1.276E+00	%(P	2.248E+00	6.84E-01	G
SN-113	-1.5540E-03						
		391.71	-1.554E-03	%(	8.411E-02	2.44E-02	G K
		255.04	-4.212E-02	&	1.921E+00	5.59E-01	G
SB-125	8.4830E-02						
		427.95	1.189E-03	%(P	1.432E-01	4.06E-02	G K
		600.77	-6.622E-02	% P	2.565E-01	7.48E-02	G
		636.15	-9.078E-04	& P	4.743E-01	1.33E-01	G
		463.51	3.324E-01	(P	4.224E-01	1.33E-01	G
		176.29	4.033E-02	& P	6.488E-01	1.91E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
I-131	-1.3733E-02						
		364.48	-1.373E-02	%(	6.077E-02	1.79E-02	G K
		636.97	-2.500E-02	&	8.362E-01	2.35E-01	G
		284.29	-1.268E-01	&	9.017E-01	2.66E-01	G
CS-134	-5.2022E-03						
		604.66	-5.202E-03	&(	4.904E-02	1.40E-02	G K
		795.76	3.543E-02	%	5.684E-02	1.78E-02	G
		569.29	-5.201E-02	%	3.422E-01	9.90E-02	G
		801.84	-6.291E-02	% P	5.724E-01	1.60E-01	G
CS-137	-9.5436E-03						
		661.62	-9.544E-03	%(	6.954E-02	2.00E-02	G
CE-139	-5.5151E-04						
		165.85	-5.515E-04	&(P	4.605E-02	1.35E-02	G
EU-152	-3.1803E-03						
		121.78	-3.180E-03	%(P	1.881E-01	5.57E-02	G K
		344.30	-3.835E-02	%	1.519E-01	4.49E-02	G
		1408.08	0.000E+00	%	3.518E-01	9.52E-02	G
		964.00	-7.195E-02	% P	4.076E-01	1.16E-01	G
		1112.07	1.246E-01	%	4.850E-01	1.41E-01	G
		778.90	-5.647E-02	% P	4.166E-01	1.18E-01	G
EU-154	-5.3111E-03						
		123.10	-5.311E-03	%(P	1.238E-01	3.67E-02	G K
		1274.80	1.139E-02	&	2.247E-01	6.26E-02	G
		723.30	-5.153E-02	% P	3.038E-01	8.75E-02	G
		1004.80	-3.768E-02	%	3.455E-01	9.69E-02	G
EU-155	-3.6417E-02						
		86.45	-3.642E-02	%(P	2.521E-01	7.50E-02	G K
		105.31	-6.319E-02	&	2.507E-01	7.51E-02	G
HG-203	-1.6772E-02						
		279.17	-1.677E-02	&(P	5.781E-02	1.73E-02	G K
		72.87	-3.109E-01	&	2.298E+00	6.88E-01	G
		70.83	-1.731E+00	&	3.986E+00	1.21E+00	G
		82.50	2.320E-01	%	4.523E+00	1.35E+00	G
TL-208	2.4564E-01						
		583.14	2.456E-01	(P	6.987E-02	3.44E-02	G
		510.72	4.328E-01	+	2.025E-01	8.40E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
PB-212	5.3214E-01						
		238.63	5.321E-01	(	1.210E-01	4.46E-02	G K
							Energy duplication
		77.11	7.797E-01	+	6.459E-01	2.02E-01	G
		74.81	7.287E-01	& P	1.314E+00	3.99E-01	G
PB-214	4.7678E-01						
		351.99	4.502E-01	@(P	9.187E-02	4.11E-02	G K
		295.22	5.281E-01	(	1.873E-01	6.95E-02	G
							Energy duplication
		77.11	1.275E+00	+	1.056E+00	3.30E-01	G
		241.92	4.823E-01	%	7.286E-01	2.23E-01	G
BI-212	7.4837E-01						
		727.17	7.484E-01	(	5.092E-01	2.23E-01	G K
		1620.56	-7.958E-02	% P	2.143E+00	5.45E-01	G
		785.42	9.651E-01	% P	2.074E+00	6.28E-01	G
BI-214	4.7603E-01						
		609.32	4.760E-01	(	1.200E-01	5.86E-02	G K
		1764.51	2.327E-02	% P	4.310E-01	1.14E-01	G
		1120.28	9.047E-01	+	4.903E-01	2.12E-01	G
RA-224	7.5281E-02						
		241.00	7.528E-02	%(P	6.784E-01	1.96E-01	G
RA-226	9.7305E-01						
		185.99	9.731E-01	%(P	1.332E+00	4.09E-01	G
AC-228	5.8149E-01						
		911.07	5.815E-01	(P	1.931E-01	9.33E-02	G K
		968.90	9.964E-01	+ P	3.687E-01	1.79E-01	G
		338.40	9.460E-01	+	3.362E-01	1.44E-01	G
TH-227	-6.7333E-02						
		236.00	-6.733E-02	%(P	4.923E-01	1.46E-01	G K
		256.25	-6.231E-02	&	6.279E-01	1.85E-01	G
PA-234	-1.3224E-02						
		98.44	-1.322E-02	&(	2.705E-01	8.04E-02	G K
		946.00	-4.616E-02	%	3.186E-01	9.07E-02	G
		131.28	-8.061E-04	&	2.165E-01	6.38E-02	G
		94.67	-1.309E-01	%	5.058E-01	1.52E-01	G
		883.24	-1.028E-02	&	4.211E-01	1.15E-01	G
		926.70	2.225E-03	&	4.695E-01	1.27E-01	G
		569.26	-7.702E-02	%	5.067E-01	1.47E-01	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments

TH-234       2.1302E+00
                           63.29 2.130E+00 %(P 4.911E+00 1.49E+00 G K
                           92.80 1.596E+00 %   2.559E+00 7.81E-01 G
                           92.38-8.877E-01 & P 3.112E+00 9.35E-01 G

AM-241      -1.2126E-01
                           59.54-1.213E-01 &(  7.367E-01 2.20E-01 G
   ( - This peak used in the nuclide activity average.

   * - Peak is too wide, but only one peak in library.
   ! - Peak is part of a multiplet and this area went
       negative during deconvolution.
   ? - Peak is too narrow.
   @ - Peak is too wide at FW25M, but ok at FWHM.
   % - Peak fails sensitivity test.
   $ - Peak identified, but first peak of this nuclide
       failed one or more qualification tests.
   + - Peak activity higher than counting uncertainty range.
   - - Peak activity lower than counting uncertainty range.
   = - Peak outside analysis energy range.
   & - Calculated peak centroid is not close enough to the
       library energy centroid for positive identification.
   P - Peakbackground subtraction
   } - Peak is too close to another for the activity
       to be found directly.

   Nuclide Codes:                      Peak Codes:
   T - Thermal Neutron Activation      G - Gamma Ray
   F - Fast Neutron Activation         X - X-Ray
   I - Fission Product                 P - Positron Decay
   N - Naturally Occurring Isotope     S - Single-Escape
   P - Photon Reaction                 D - Double-Escape
   C - Charged Particle Reaction       K - Key Line
   M - No MDA Calculation              A - Not in Average
   R - Coincidence Corrected           C - Coincidence Peak
   H - Halflife limit exceeded

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
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***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	-1.1632E-02	-1.1968E-02	4.2282E-01	4.2282E-01	4.795E-01
K-40		1.2573E+01	1.2573E+01	1.8407E+00	1.9713E+00	4.912E-01
MN-54	#A	3.2217E-02	3.2374E-02	4.5928E-02	4.5964E-02	4.832E-02
CO-57	#B	1.0126E-03	1.0183E-03	5.0850E-02	5.0850E-02	5.700E-02
CO-60	#B	-4.4055E-03	-4.4090E-03	5.5767E-02	5.5768E-02	6.200E-02
Sr-85	#A	-1.0981E-02	-1.1241E-02	5.2862E-02	5.2865E-02	5.872E-02

Kr-85	#A	-2.4357E+02	-2.4357E+02	1.1864E+03	1.1865E+03	1.350E+03
Y-88	#B	3.3758E-03	3.4242E-03	2.5551E-02	2.5552E-02	3.528E-02
NB-94	#B	-3.5394E-03	-3.5394E-03	3.8717E-02	3.8717E-02	4.697E-02
Ag-108M	#B	-4.6669E-03	-4.6670E-03	4.8338E-02	4.8339E-02	5.720E-02
CD-109	#A	1.2717E+00	1.2759E+00	2.0521E+00	2.0533E+00	2.241E+00
SN-113	#B	-1.5336E-03	-1.5540E-03	7.3119E-02	7.3119E-02	8.301E-02
SB-125	#B	8.4703E-02	8.4830E-02	1.0173E-01	1.0184E-01	1.430E-01
I-131	#B	-1.1369E-02	-1.3733E-02	5.3664E-02	5.3670E-02	5.031E-02
CS-134	#B	-5.1918E-03	-5.2022E-03	4.1884E-02	4.1885E-02	4.894E-02
CS-137	#A	-9.5423E-03	-9.5436E-03	6.0137E-02	6.0140E-02	6.953E-02
CE-139	#A	-5.4545E-04	-5.5151E-04	1.1325E-01	1.1325E-01	4.555E-02
EU-152	#B	-3.1793E-03	-3.1803E-03	4.4264E-01	4.4264E-01	1.881E-01
EU-154	#B	-5.3085E-03	-5.3111E-03	1.2050E-01	1.2050E-01	1.237E-01
EU-155	#B	-3.6386E-02	-3.6417E-02	3.4830E-01	3.4831E-01	2.519E-01
HG-203	#B	-1.6234E-02	-1.6772E-02	5.2260E-02	5.2269E-02	5.595E-02
TL-208		2.4564E-01	2.4564E-01	1.0301E-01	1.0393E-01	
PB-212	#	5.3214E-01	5.3214E-01	1.3379E-01	1.3708E-01	1.210E-01
PB-214	#	4.7678E-01	4.7678E-01	1.1449E-01	1.1757E-01	9.187E-02
BI-212		7.4837E-01	7.4837E-01	6.6689E-01	6.6821E-01	
BI-214		4.7603E-01	4.7603E-01	1.7546E-01	1.7748E-01	
RA-224	A	7.5281E-02	7.5281E-02	5.8719E-01	5.8721E-01	6.784E-01
RA-226	#A	9.7305E-01	9.7305E-01	1.2263E+00	1.2275E+00	1.332E+00
AC-228		5.8149E-01	5.8149E-01	2.7962E-01	2.8152E-01	
TH-227	#B	-6.7333E-02	-6.7333E-02	4.5842E-01	4.5843E-01	4.923E-01
PA-234	#B	-1.3224E-02	-1.3224E-02	2.4135E-01	2.4135E-01	2.705E-01
TH-234	#B	2.1302E+00	2.1302E+00	4.4578E+00	4.4594E+00	4.911E+00
AM-241	#A	-1.2126E-01	-1.2126E-01	6.6022E-01	6.6025E-01	7.367E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (276.7 to 1999.0 keV) 1.4624154E+01 pCi/gm
Total Decayed Activity (276.7 to 1999.0 keV) 1.4624154E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JJM

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 102F_13SEPT2006_1837.An1

Sample description
FSS-OOL-05-08-021-F-B

Spectrum Filename: C:\GammaVision\Spectra\102F_13SEPT2006_1837.An1

Acquisition information
Start time: 13-Sep-2006 18:37:34
Live time: 2000
Real time: 2021
Dead time: 1.03 %
Detector ID: 3

Detector system
Det 102 - DSPP-468

Calibration
Filename: D2_1LSa.Clb
DET 102 1 Liter Sand Geometry

Energy Calibration
Created: 15-Jan-2005 03:09:29
Zero offset: 0.220 keV
Gain: 0.500 keV/channel
Quadratic: -6.435E-08 keV/channel^2

Efficiency Calibration
Created: 15-Jan-2005 06:48:10
Type: Polynomial
Uncertainty: 0.497 %
Coefficients: -0.294180 -5.980622 0.744607
-0.096737 0.005214 -0.000120

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.22keV)
Stop channel: 4000 (1999.02keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 1.7680E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.7680E+03) =
5.6561E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	12-Sep-2006 07:35:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	102_150K_28APR05.Pbc 01-May-2005 05:27:47
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 13 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.6896

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
77.12	209.	21.27	1.50	9.541E-03	77.11	17.500	9.570E-01	PB212
					77.11	10.700	1.565E+00	PB214
77.12	209.	21.27	1.50	9.541E-03	77.11	17.500	PBC<MDA	PB212
					77.11	10.700	1.565E+00	PB214
92.55	172.	26.42	2.19	1.328E-02	92.38	2.570	3.834E+00	TH234
					92.80	3.000	3.287E+00	TH234
186.35	121.	27.28	1.10	1.625E-02	185.99	3.280	1.667E+00	RA226
208.91	110.	25.90	1.46	1.521E-02				
239.04	582.	4.99	1.22	1.379E-02	238.63	43.100	7.473E-01	PB212
242.68	87.	23.53	1.22	1.362E-02	241.00	3.900	PBC<MDA	RA224
					241.92	7.470	6.492E-01	PB214
270.87	99.	25.21	0.92	1.240E-02				
295.73	183.	10.66	1.26	1.146E-02	295.22	19.200	6.345E-01	PB214
301.00	42.	35.35	1.26	1.127E-02				
338.74	119.	21.01	1.46	1.005E-02	338.40	12.010	7.541E-01	AC228
352.49	345.	9.37	1.12	9.665E-03	351.99	37.100	7.335E-01	PB214
463.70	37.	32.87	1.50	7.365E-03	463.51	10.000	PBC<MDA	SB125
511.81	85.	17.04	1.43	6.681E-03	510.72	22.500	4.313E-01	TL208
584.26	204.	9.89	1.50	5.879E-03	583.14	86.000	3.065E-01	TL208
610.27	222.	9.92	1.43	5.641E-03	609.32	46.090	6.517E-01	BI214
728.28	80.	20.91	1.12	4.787E-03	727.17	11.800	1.081E+00	BI212
771.41	60.	19.71	1.57	4.544E-03				
912.48	114.	14.77	1.41	3.917E-03	911.07	29.000	7.653E-01	AC228
970.32	92.	19.86	0.81	3.713E-03				
1463.02	561.	4.41	1.69	2.617E-03	1460.75	10.700	1.528E+01	K40
1621.96	10.	31.62	0.75	2.397E-03	1620.56	2.750	1.121E+00	BI212

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
417.44	208.91	284.	110.	0.055	77.71	1.465	AC-228	s
477.72	239.05	131.	582.	0.291	14.97	1.215	PB-212	D
484.99	242.68	164.	87.	0.043	70.58	1.218	XE-138	D
541.38	270.87	185.	99.	0.049	75.62	0.919	AC-228	s
601.66	300.71	89.	42.	0.021	106.06	1.259	PB-212	lD
1542.81	771.41	29.	60.	0.030	54.09	1.568	AC-228	sM
1940.85	970.32	56.	92.	0.046	46.80	0.808	AC-228	s

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.
M - Peak is close to a library peak.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-212	153.80	77.11	884.	209.	0.105	63.80	1.500D
PB-214	153.80	77.11	884.	209.	0.105	63.80	1.500D
TH-234	185.79	93.11	842.	119.	0.059	106.13	1.500s
TH-234	185.73	93.07	821.	121.	0.061	103.79	1.500s
RA-226	372.30	186.35	376.	116.	0.058	81.84	1.097s
PB-212	477.70	239.04	388.	492.	0.246	21.69	1.500
PB-214	591.06	295.70	199.	175.	0.088	40.95	1.500s
AC-228	677.16	338.74	164.	119.	0.060	63.02	1.459s
PB-214	704.78	352.55	157.	282.	0.141	25.96	1.500
SB-125	927.16	463.70	64.	37.	0.019	98.62	1.500s
TL-208	1023.40	511.81	48.	85.	0.043	51.12	1.432s
TL-208	1168.36	584.26	58.	203.	0.102	29.66	1.498
BI-214	1220.39	610.27	75.	222.	0.111	29.75	1.430
BI-212	1455.89	727.97	61.	89.	0.045	62.43	1.127s
AC-228	1825.11	912.48	46.	114.	0.057	44.30	1.406s
K-40	2926.98	1463.03	18.	532.	0.266	13.43	2.042
BI-212	3245.11	1621.96	0.	10.	0.005	94.87	0.749s

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	MDA Value pCi/gm	COMMENTS
BE-7		2.2116E-02					
			477.56	2.212E-02	%(	3.863E-01 1.10E-01	G
K-40		1.4494E+01					
			1460.75	1.449E+01	(P	6.088E-01 6.49E-01	G
MN-54		-3.5178E-03					
			834.81	-3.518E-03	&(P	6.323E-02 1.78E-02	G
CO-57		6.8563E-03					
			122.07	6.856E-03	%(	6.299E-02 1.88E-02	G K
			136.43	-6.216E-02	&	4.590E-01 1.37E-01	G
CO-60		-4.5698E-03					
			1332.51	-4.570E-03	%(P	7.401E-02 2.05E-02	G K
			1173.23	2.852E-02	%	8.573E-02 2.54E-02	G K
Sr-85		-4.9202E-03					
			514.00	-4.920E-03	%(	4.380E-02 1.26E-02	G
Kr-85		-3.0133E+02					
			513.99	-3.013E+02	%(	1.250E+03 3.68E+02	G
Y-88		-9.5447E-03					
			1836.01	-9.545E-03	%(P	6.491E-02 1.77E-02	G K
			898.02	-3.920E-03	& P	6.133E-02 1.69E-02	G
NB-94		-4.1485E-03					
			871.10	-4.148E-03	&(	5.647E-02 1.58E-02	G K
			702.50	7.302E-04	&	5.278E-02 1.48E-02	G K
Ag-108M		0.0000E+00					
			722.95	0.000E+00	&(	6.603E-02 1.86E-02	G K
			614.37	-4.317E-02	% P	8.377E-02 2.55E-02	G
			433.93	-1.151E-03	&	4.706E-02 1.34E-02	G
CD-109		-1.1332E-01					
			88.04	-1.133E-01	&(P	2.456E+00 7.32E-01	G
SN-113		9.8717E-03					
			391.71	9.872E-03	%(	7.307E-02 2.14E-02	G K
			255.04	-4.269E-01	%	2.355E+00 7.00E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	1.0453E-01						
		427.95	8.227E-03	&(P	1.549E-01	4.45E-02	G K
		600.77	1.014E-01	% P	2.359E-01	7.09E-02	G
		636.15	3.383E-02	& P	3.831E-01	1.08E-01	G
		463.51	3.896E-01	*(P	4.167E-01	1.33E-01	G
		176.29	-3.745E-02	% P	7.760E-01	2.29E-01	G
I-131	4.7554E-04						
		364.48	4.755E-04	%(	5.402E-02	1.55E-02	G K
		636.97	-1.768E-01	%	8.168E-01	2.38E-01	G
		284.29	1.086E-01	%	7.833E-01	2.31E-01	G
CS-134	-8.3585E-03						
		604.66	-8.358E-03	%(	5.204E-02	1.50E-02	G K
		795.76	3.734E-02	%	6.481E-02	2.00E-02	G
		569.29	-1.052E-01	%	3.701E-01	1.10E-01	G
		801.84	2.257E-01	% P	5.038E-01	1.52E-01	G
CS-137	1.3253E-02						
		661.62	1.325E-02	&(	6.595E-02	1.92E-02	G
CE-139	2.0320E-03						
		165.85	2.032E-03	&(P	5.401E-02	1.60E-02	G
EU-152	1.6780E-02						
		121.78	1.678E-02	%(P	1.896E-01	5.65E-02	G K
		344.30	-3.545E-02	%	1.708E-01	5.05E-02	G
		1408.08	-3.767E-02	%	2.754E-01	7.60E-02	G
		964.00	2.029E-01	% P	3.796E-01	1.16E-01	G
		1112.07	1.866E-01	%	4.873E-01	1.45E-01	G
		778.90	9.142E-02	% P	3.289E-01	9.55E-02	G
EU-154	-6.5948E-03						
		123.10	-6.595E-03	%(P	1.390E-01	4.13E-02	G K
		1274.80	-4.646E-03	&	1.668E-01	4.50E-02	G
		723.30	1.483E-03	& P	2.931E-01	8.23E-02	G
		1004.80	4.040E-02	%	3.719E-01	1.05E-01	G
EU-155	1.3280E-01						
		86.45	1.328E-01	%(P	2.771E-01	8.40E-02	G K
		105.31	2.391E-02	%	2.549E-01	7.58E-02	G
HG-203	2.4850E-02						
		279.17	2.485E-02	%(P	4.730E-02	1.44E-02	G K
		72.87	-3.785E-01	%	2.346E+00	7.04E-01	G
		70.83	1.095E+00	%	4.218E+00	1.27E+00	G
		82.50	-9.910E-01	&	4.478E+00	1.34E+00	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	3.0646E-01						
		583.14	3.065E-01	(P	5.760E-02	3.04E-02	G
		510.72	4.313E-01	+	1.776E-01	7.36E-02	G
PB-212	6.3260E-01						
		238.63	6.326E-01	(	1.214E-01	4.57E-02	G K
							Energy duplication
		77.11	9.570E-01	+	6.466E-01	2.04E-01	G
		74.81	8.421E-01	& P	1.381E+00	4.20E-01	G
PB-214	6.0284E-01						
		351.99	5.996E-01	(P	1.301E-01	5.20E-02	G K
		295.22	6.090E-01	@(	2.376E-01	8.31E-02	G
							Energy duplication
		77.11	1.565E+00	+	1.058E+00	3.33E-01	G
		241.92	4.686E-01	%	7.709E-01	2.35E-01	G
BI-212	1.1892E+00						
		727.17	1.205E+00	*(	5.276E-01	2.51E-01	G K
		1620.56	1.121E+00	(P	8.546E-01	3.67E-01	G
		785.42	4.596E-01	% P	2.806E+00	8.06E-01	G
BI-214	6.5169E-01						
		609.32	6.517E-01	(	1.264E-01	6.47E-02	G K
		1764.51	-1.138E-01	% P	5.104E-01	1.45E-01	G
		1120.28	-5.599E-02	&	6.037E-01	1.73E-01	G
RA-224	9.7897E-01						
		241.00	9.790E-01	&(P	1.471E+00	4.50E-01	G
RA-226	1.6667E+00						
		185.99	1.667E+00	*(P	1.333E+00	4.73E-01	G
AC-228	7.6198E-01						
		911.07	7.653E-01	@(P	2.309E-01	1.13E-01	G K
		968.90	2.714E-03	% P	5.048E-01	1.44E-01	G
		338.40	7.541E-01	*(	3.944E-01	1.59E-01	G
TH-227	-1.3981E-03						
		236.00	-1.398E-03	%(P	5.830E-01	1.73E-01	G K
		256.25	-2.758E-02	&	7.102E-01	2.09E-01	G
PA-234	1.0259E-01						
		98.44	1.026E-01	%(	2.694E-01	8.14E-02	G K
		946.00	4.351E-02	%	2.635E-01	7.47E-02	G
		131.28	-3.186E-02	%	2.779E-01	8.29E-02	G
		94.67	4.378E-03	%	4.698E-01	1.40E-01	G
		883.24	1.568E-01	%	4.378E-01	1.30E-01	G
		926.70	6.816E-02	%	3.553E-01	9.94E-02	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26-1.558E-01 %   5.483E-01 1.62E-01 G

TH-234       2.2752E+00
                           63.29 1.982E+00 %(P 5.098E+00 1.54E+00 G K
                           92.80 2.320E+00 *(  2.604E+00 8.03E-01 G
                           92.38 2.667E+00 *(P 3.097E+00 9.53E-01 G

AM-241      -9.1411E-03
                           59.54-9.141E-03 &(  7.328E-01 2.18E-01 G
   ( - This peak used in the nuclide activity average.

   * - Peak is too wide, but only one peak in library.
   ! - Peak is part of a multiplet and this area went
       negative during deconvolution.
   ? - Peak is too narrow.
   @ - Peak is too wide at FW25M, but ok at FWHM.
   % - Peak fails sensitivity test.
   $ - Peak identified, but first peak of this nuclide
       failed one or more qualification tests.
   + - Peak activity higher than counting uncertainty range.
   - - Peak activity lower than counting uncertainty range.
   = - Peak outside analysis energy range.
   & - Calculated peak centroid is not close enough to the
       library energy centroid for positive identification.
   P - Peakbackground subtraction
   } - Peak is too close to another for the activity
       to be found directly.

   Nuclide Codes:                      Peak Codes:
   T - Thermal Neutron Activation      G - Gamma Ray
   F - Fast Neutron Activation         X - X-Ray
   I - Fission Product                 P - Positron Decay
   N - Naturally Occurring Isotope     S - Single-Escape
   P - Photon Reaction                 D - Double-Escape
   C - Charged Particle Reaction       K - Key Line
   M - No MDA Calculation              A - Not in Average
   R - Coincidence Corrected           C - Coincidence Peak
   H - Halflife limit exceeded

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***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	2.1700E-02	2.2116E-02	3.2881E-01	3.2881E-01	3.790E-01
K-40		1.4494E+01	1.4494E+01	1.9472E+00	2.1103E+00	6.088E-01
MN-54	#A	-3.5064E-03	-3.5178E-03	6.6653E-02	6.6653E-02	6.303E-02
CO-57	#B	6.8307E-03	6.8563E-03	5.6329E-02	5.6331E-02	6.276E-02
CO-60	#B	-4.5674E-03	-4.5698E-03	6.7432E-02	6.7432E-02	7.398E-02

Sr-85	#A	-4.8440E-03	-4.9202E-03	3.7678E-02	3.7679E-02	4.313E-02
Kr-85	#A	-3.0133E+02	-3.0133E+02	1.1051E+03	1.1053E+03	1.250E+03
Y-88	#B	-9.4545E-03	-9.5447E-03	5.3429E-02	5.3432E-02	6.430E-02
NB-94	#B	-4.1485E-03	-4.1485E-03	4.7533E-02	4.7533E-02	5.647E-02
Ag-108M	#B	0.0000E+00	0.0000E+00	5.5793E-02	5.5794E-02	6.603E-02
CD-109	#A	-1.1307E-01	-1.1332E-01	3.3963E+00	3.3963E+00	2.450E+00
SN-113	#B	9.7853E-03	9.8717E-03	6.4083E-02	6.4085E-02	7.243E-02
SB-125	#B	1.0442E-01	1.0453E-01	1.0733E-01	1.0749E-01	1.548E-01
I-131	#B	4.1929E-04	4.7554E-04	4.6420E-02	4.6420E-02	4.763E-02
CS-134	#B	-8.3473E-03	-8.3585E-03	4.5141E-02	4.5143E-02	5.197E-02
CS-137	#A	1.3252E-02	1.3253E-02	5.7598E-02	5.7603E-02	6.594E-02
CE-139	#A	2.0171E-03	2.0320E-03	4.7874E-02	4.7874E-02	5.362E-02
EU-152	#B	1.6777E-02	1.6780E-02	1.6944E-01	1.6945E-01	1.896E-01
EU-154	#B	-6.5927E-03	-6.5948E-03	1.3299E-01	1.3299E-01	1.390E-01
EU-155	#B	1.3273E-01	1.3280E-01	2.5191E-01	2.5202E-01	2.770E-01
HG-203	#B	2.4316E-02	2.4850E-02	4.3209E-02	4.3231E-02	4.629E-02
TL-208		3.0646E-01	3.0646E-01	9.1073E-02	9.2682E-02	
PB-212	#	6.3260E-01	6.3260E-01	1.3723E-01	1.4175E-01	1.214E-01
PB-214	#	6.0284E-01	6.0284E-01	1.4620E-01	1.5006E-01	1.301E-01
BI-212		1.1892E+00	1.1892E+00	6.9173E-01	6.9494E-01	
BI-214		6.5169E-01	6.5169E-01	1.9384E-01	1.9726E-01	
RA-224	#A	9.7897E-01	9.7897E-01	1.3508E+00	1.3519E+00	1.471E+00
RA-226	#	1.6667E+00	1.6667E+00	1.4163E+00	1.4194E+00	
AC-228	#	7.6198E-01	7.6198E-01	2.9369E-01	2.9678E-01	
TH-227	#B	-1.3981E-03	-1.3981E-03	2.9588E-01	2.9588E-01	5.830E-01
PA-234	#B	1.0259E-01	1.0259E-01	2.4410E-01	2.4417E-01	2.694E-01
TH-234	#B	2.2752E+00	2.2752E+00	2.0988E+00	2.1026E+00	5.098E+00
AM-241	#A	-9.1411E-03	-9.1411E-03	6.5256E-01	6.5256E-01	7.328E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (969.9 to 1999.0 keV) 1.9069925E+01 pCi/gm
Total Decayed Activity (969.9 to 1999.0 keV) 1.9069929E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JJM

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 102F_13SEPT2006_1916.An1

Sample description
FSS-OOL-05-08-019-F

Spectrum Filename: C:\GammaVision\Spectra\102F_13SEPT2006_1916.An1

Acquisition information
Start time: 13-Sep-2006 19:16:35
Live time: 2000
Real time: 2018
Dead time: 0.90 %
Detector ID: 3

Detector system
Det 102 - DSPP-468

Calibration
Filename: D2_1LSa.Clb
DET 102 1 Liter Sand Geometry

Energy Calibration
Created: 15-Jan-2005 03:09:29
Zero offset: 0.220 keV
Gain: 0.500 keV/channel
Quadratic: -6.435E-08 keV/channel^2

Efficiency Calibration
Created: 15-Jan-2005 06:48:10
Type: Polynomial
Uncertainty: 0.497 %
Coefficients: -0.294180 -5.980622 0.744607
-0.096737 0.005214 -0.000120

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.22keV)
Stop channel: 4000 (1999.02keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 1.5550E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.5550E+03) =
6.4309E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	11-Sep-2006 13:31:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	102_150K_28APR05.Pbc 01-May-2005 05:27:47
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 14 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.7233

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
77.25	171.	23.97	1.50	9.541E-03	77.11	10.700	1.456E+00	PB214
					77.11	17.500	8.903E-01	PB212
77.25	171.	23.97	1.50	9.541E-03	77.11	10.700	1.456E+00	PB214
					77.11	17.500	8.903E-01	PB212
93.13	104.	36.93	1.50	1.333E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	2.267E+00	TH234
93.14	102.	37.67	1.50	1.325E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
129.42	67.	40.40	1.50	1.722E-02				
129.42	67.	40.40	1.50	1.722E-02	131.28	20.000	PBC<MDA	PA234
186.68	78.	36.08	1.40	1.624E-02	185.99	3.280	PBC<MDA	RA226
209.67	94.	33.29	0.77	1.517E-02				
239.06	540.	5.15	1.22	1.378E-02	238.63	43.100	7.880E-01	PB212
242.66	85.	23.13	1.22	1.362E-02	241.00	3.900	PBC<MDA	RA224
					241.92	7.470	7.229E-01	PB214
270.69	77.	30.05	1.42	1.241E-02				
295.78	118.	13.62	1.26	1.145E-02	295.22	19.200	4.642E-01	PB214
300.83	48.	26.80	1.26	1.127E-02				
339.24	125.	17.26	1.37	1.004E-02	338.40	12.010	9.005E-01	AC228
352.46	219.	11.32	1.51	9.666E-03	351.99	37.100	5.286E-01	PB214
463.37	76.	22.92	1.00	7.367E-03				
463.37	76.	22.92	1.00	7.367E-03	463.51	10.000	8.799E-01	SB125
511.65	96.	19.68	1.50	6.683E-03	510.72	22.500	5.550E-01	TL208
					513.99	0.004	2.922E+03	Kr85
					514.00	99.270	1.296E-01	Sr85
584.07	171.	10.77	1.43	5.881E-03	583.14	86.000	2.927E-01	TL208
610.35	156.	9.98	1.34	5.640E-03	609.32	46.090	5.220E-01	BI214

728.47	53.	25.54	2.28	4.794E-03	727.17	11.800	8.142E-01	BI212
796.82	21.	34.88	1.44	4.414E-03	795.76	85.400	4.938E-02	CS134
912.62	117.	12.04	1.36	3.916E-03				
969.79	77.	18.34	1.55	3.715E-03	968.90	17.460	1.030E+00	AC228
1122.32	27.	34.67	1.82	3.283E-03	1120.28	15.040	PBC<MDA	BI214
1463.19	430.	4.88	2.01	2.617E-03				

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide
418.96	209.67	306.	94.	0.047	99.86	0.767	NP-239 sM
477.75	239.08	116.	540.	0.270	15.45	1.215	PB-212 D
484.96	242.68	150.	85.	0.042	69.39	1.218	XE-138 D
541.02	270.69	168.	77.	0.038	90.14	1.418	AC-228 sM
601.22	300.78	77.	42.	0.021	100.00	0.789	PB-212 sM
926.48	463.37	102.	39.	0.019	120.41	0.999	SB-125 s
1593.65	796.82	16.	21.	0.011	104.64	1.444	PA-234 l
1825.39	912.62	23.	118.	0.059	32.42	1.360	AC-228 M
1939.79	969.79	79.	34.	0.017	123.20	1.550	AC-228 M
2927.28	1463.19	3.	430.	0.215	14.56	2.005	K-40 M

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.
M - Peak is close to a library peak.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-214	153.80	77.11	755.	171.	0.086	71.90	1.500D
PB-212	153.80	77.11	755.	171.	0.086	71.90	1.500D
TH-234	185.86	93.14	710.	102.	0.051	113.00	1.500s
TH-234	185.84	93.13	690.	104.	0.052	110.80	1.500s
PA-234	258.43	129.42	334.	67.	0.034	121.19	1.500s
RA-226	372.33	186.36	351.	69.	0.034	113.50	1.500s
PB-212	477.75	239.06	380.	464.	0.232	22.61	1.500s
PB-214	591.29	295.82	143.	126.	0.063	48.27	1.500s
AC-228	677.64	338.98	108.	106.	0.053	50.80	1.500
PB-214	704.70	352.51	85.	205.	0.103	28.26	1.500
SB-125	926.94	463.60	64.	36.	0.018	102.71	1.500s
TL-208	1023.08	511.65	73.	96.	0.048	59.03	1.504s
Kr-85	1023.03	511.63	54.	35.	0.017	102.94	1.500
Sr-85	1023.42	511.82	54.	34.	0.017	105.09	1.499
TL-208	1167.97	584.07	56.	171.	0.085	32.30	1.430s
BI-214	1220.56	610.35	34.	156.	0.078	29.95	1.338
BI-212	1456.90	728.47	42.	53.	0.026	76.61	2.282s
AC-228	1940.78	970.29	22.	43.	0.022	64.54	1.718
BI-214	2245.04	1122.32	31.	27.	0.014	104.00	1.819

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	Peak MDA Value pCi/gm	COMMENTS
BE-7		1.2512E-01					
			477.56	1.251E-01	%(	4.953E-01 1.46E-01	G
K-40		-4.6830E-03					
			1460.75	-4.683E-03	%(P	5.309E-01 1.35E-01	G
MN-54		2.9481E-03					
			834.81	2.948E-03	&(P	5.812E-02 1.61E-02	G
CO-57		-1.2541E-02					
			122.07	-1.254E-02	&(	6.103E-02 1.82E-02	G K
			136.43	3.348E-02	%	4.910E-01 1.46E-01	G
CO-60		-8.1370E-03					
			1332.51	-8.137E-03	%(P	7.647E-02 2.12E-02	G K
			1173.23	3.199E-03	&	8.212E-02 2.28E-02	G K
Sr-85		4.6005E-02					
			514.00	4.600E-02	&(	4.999E-02 1.61E-02	G
Kr-85		1.0595E+03					
			513.99	1.060E+03	&(	1.124E+03 3.64E+02	G
Y-88		-3.1049E-03					
			1836.01	-3.105E-03	%(P	6.006E-02 1.52E-02	G K
			898.02	-1.869E-03	% P	6.736E-02 1.83E-02	G
NB-94		4.9417E-03					
			871.10	4.942E-03	%(	5.501E-02 1.53E-02	G K
			702.50	-1.856E-03	&	5.479E-02 1.53E-02	G K
Ag-108M		-1.1156E-04					
			722.95	-1.116E-04	&(	6.624E-02 1.85E-02	G K
			614.37	-2.765E-02	% P	7.132E-02 2.13E-02	G
			433.93	-1.355E-02	%	6.063E-02 1.79E-02	G
CD-109		7.1505E-02					
			88.04	7.151E-02	%(P	2.568E+00 7.64E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SN-113	1.2602E-02						
		391.71	1.260E-02	%(	6.763E-02	1.97E-02	G K
		255.04	-3.814E-01	%	2.207E+00	6.53E-01	G
SB-125	7.6995E-02						
		427.95	-3.914E-02	%(P	1.706E-01	4.98E-02	G K
		600.77	4.486E-03	& P	2.448E-01	6.77E-02	G
		636.15	-9.803E-04	% P	5.466E-01	1.54E-01	G
		463.51	4.208E-01	*(P	4.721E-01	1.50E-01	G
		176.29	-7.536E-02	& P	7.639E-01	2.25E-01	G
I-131	-1.7317E-02						
		364.48	-1.732E-02	%(	7.113E-02	2.10E-02	G K
		636.97	-1.343E-01	%	8.489E-01	2.43E-01	G
		284.29	-1.424E-01	%	9.371E-01	2.76E-01	G
CS-134	0.0000E+00						
		604.66	0.000E+00	%(	5.828E-02	1.64E-02	G K
		795.76	4.057E-02	%	5.703E-02	1.82E-02	G
		569.29	5.639E-02	%	3.115E-01	8.98E-02	G
		801.84	1.430E-01	% P	6.101E-01	1.76E-01	G
CS-137	4.2442E-02						
		661.62	4.244E-02	%(	7.054E-02	2.18E-02	G
CE-139	-3.2507E-03						
		165.85	-3.251E-03	%(P	5.934E-02	1.75E-02	G
EU-152	-3.7476E-02						
		121.78	-3.748E-02	%(P	1.830E-01	5.46E-02	G K
		344.30	-2.387E-02	%	1.896E-01	5.56E-02	G
		1408.08	-9.784E-03	&	2.928E-01	7.74E-02	G
		964.00	7.708E-03	& P	3.479E-01	9.28E-02	G
		1112.07	-3.636E-02	&	6.198E-01	1.74E-01	G
		778.90	-5.119E-02	% P	4.524E-01	1.28E-01	G
EU-154	4.9977E-02						
		123.10	4.998E-02	%(P	1.229E-01	3.71E-02	G K
		1274.80	4.837E-02	&	2.052E-01	5.90E-02	G
		723.30	-6.354E-02	& P	3.423E-01	9.90E-02	G
		1004.80	1.355E-02	%	3.783E-01	1.04E-01	G
EU-155	-6.0989E-03						
		86.45	-6.099E-03	&(P	3.113E-01	9.25E-02	G K
		105.31	8.370E-02	&	2.765E-01	8.31E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
HG-203	9.3167E-03						
		279.17	9.317E-03	%(P	5.758E-02	1.70E-02	G K
		72.87	-5.593E-01	&	2.362E+00	7.10E-01	G
		70.83	-1.921E+00	&	4.272E+00	1.29E+00	G
		82.50	-3.361E-01	%	3.592E+00	1.07E+00	G
TL-208	2.9268E-01						
		583.14	2.927E-01	@(P	6.469E-02	3.16E-02	G
		510.72	5.550E-01	+	2.450E-01	1.09E-01	G
PB-212	6.7802E-01						
		238.63	6.780E-01	@(	1.366E-01	5.11E-02	G K
							Energy duplication
		77.11	8.903E-01	+	6.805E-01	2.13E-01	G
		74.81	7.181E-01	& P	1.387E+00	4.21E-01	G
PB-214	4.9666E-01						
		351.99	4.961E-01	(P	1.104E-01	4.68E-02	G K
		295.22	4.977E-01	@(	2.305E-01	8.01E-02	G
							Energy duplication
		77.11	1.456E+00	+	1.113E+00	3.49E-01	G
		241.92	4.127E-01	%	8.664E-01	2.63E-01	G
BI-212	8.1420E-01						
		727.17	8.142E-01	(	5.056E-01	2.08E-01	G K
		1620.56	-4.743E-01	% P	2.491E+00	6.82E-01	G
		785.42	8.028E-01	% P	2.949E+00	8.61E-01	G
BI-214	5.1105E-01						
		609.32	5.220E-01	(	9.920E-02	5.22E-02	G K
		1764.51	-2.126E-03	% P	5.530E-01	1.47E-01	G
		1120.28	4.775E-01	&(	5.018E-01	1.66E-01	G
RA-224	4.0095E-01						
		241.00	4.010E-01	%(P	1.681E+00	5.03E-01	G
RA-226	1.1187E+00						
		185.99	1.119E+00	*(P	1.466E+00	4.51E-01	G
AC-228	2.8618E-01						
		911.07	-8.732E-02	%(P	2.529E-01	7.48E-02	G K
		968.90	5.784E-01	(P	3.267E-01	1.25E-01	G
		338.40	7.633E-01	(	3.685E-01	1.29E-01	G
TH-227	-2.3802E-01						
		236.00	-2.380E-01	%(P	5.742E-01	1.73E-01	G K
		256.25	-1.342E-01	&	6.365E-01	1.89E-01	G

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 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments

PA-234       5.2249E-02
                           98.44-4.105E-02 &(  2.596E-01 7.74E-02 G K
                          946.00 7.483E-02 &   3.213E-01 9.28E-02 G
                          131.28 1.693E-01 &(  2.217E-01 6.84E-02 G
                           94.67-6.989E-04 %   5.189E-01 1.54E-01 G
                          883.24 1.632E-01 %   4.208E-01 1.25E-01 G
                          926.70-7.159E-02 &   5.432E-01 1.53E-01 G
                          569.26 8.345E-02 %   4.612E-01 1.33E-01 G

TH-234       2.0619E+00
                           63.29 1.542E+00 %(P 4.961E+00 1.49E+00 G K
                           92.80 2.267E+00 &(  2.719E+00 8.37E-01 G
                           92.38 2.612E+00 &(P 3.238E+00 9.95E-01 G

AM-241      -1.0244E-01
                           59.54-1.024E-01 &(  7.385E-01 2.20E-01 G
   ( - This peak used in the nuclide activity average.

   * - Peak is too wide, but only one peak in library.
   ! - Peak is part of a multiplet and this area went
       negative during deconvolution.
   ? - Peak is too narrow.
   @ - Peak is too wide at FW25M, but ok at FWHM.
   % - Peak fails sensitivity test.
   $ - Peak identified, but first peak of this nuclide
       failed one or more qualification tests.
   + - Peak activity higher than counting uncertainty range.
   - - Peak activity lower than counting uncertainty range.
   = - Peak outside analysis energy range.
   & - Calculated peak centroid is not close enough to the
       library energy centroid for positive identification.
   P - Peakbackground subtraction
   } - Peak is too close to another for the activity
       to be found directly.

   Nuclide Codes:                      Peak Codes:
   T - Thermal Neutron Activation      G - Gamma Ray
   F - Fast Neutron Activation         X - X-Ray
   I - Fission Product                 P - Positron Decay
   N - Naturally Occurring Isotope     S - Single-Escape
   P - Photon Reaction                 D - Double-Escape
   C - Charged Particle Reaction       K - Key Line
   M - No MDA Calculation              A - Not in Average
   R - Coincidence Corrected           C - Coincidence Peak
   H - Halflife limit exceeded

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
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***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	1.2153E-01	1.2512E-01	4.3694E-01	4.3699E-01	4.811E-01
K-40	#A	-4.6830E-03	-4.6830E-03	1.2199E-01	1.2199E-01	5.309E-01
MN-54	#A	2.9334E-03	2.9481E-03	4.8308E-02	4.8308E-02	5.783E-02
CO-57	#B	-1.2469E-02	-1.2541E-02	5.4698E-02	5.4703E-02	6.068E-02
CO-60	#B	-8.1304E-03	-8.1370E-03	6.7530E-02	6.7532E-02	7.641E-02
Sr-85	#A	4.4916E-02	4.6005E-02	4.8347E-02	4.8416E-02	4.880E-02
Kr-85	#A	1.0595E+03	1.0595E+03	1.0907E+03	1.0923E+03	1.124E+03
Y-88	#B	-3.0600E-03	-3.1049E-03	4.6542E-02	4.6543E-02	5.919E-02
NB-94	#B	4.9417E-03	4.9417E-03	4.5875E-02	4.5875E-02	5.501E-02
Ag-108M	#B	-1.1155E-04	-1.1156E-04	5.5412E-02	5.5412E-02	6.624E-02
CD-109	#A	7.1261E-02	7.1505E-02	2.2933E+00	2.2933E+00	2.559E+00
SN-113	#B	1.2433E-02	1.2602E-02	5.9215E-02	5.9219E-02	6.673E-02
SB-125	#B	7.6877E-02	7.6995E-02	8.2516E-02	8.2629E-02	1.703E-01
I-131	#B	-1.4276E-02	-1.7317E-02	6.3074E-02	6.3081E-02	5.864E-02
CS-134	#B	0.0000E+00	0.0000E+00	4.9191E-02	4.9191E-02	5.816E-02
CS-137	#A	4.2436E-02	4.2442E-02	6.5388E-02	6.5431E-02	7.053E-02
CE-139	#A	-3.2142E-03	-3.2507E-03	6.2560E-02	6.2561E-02	5.867E-02
EU-152	#B	-3.7464E-02	-3.7476E-02	1.7796E-01	1.7798E-01	1.829E-01
EU-154	#B	4.9952E-02	4.9977E-02	1.1133E-01	1.1137E-01	1.228E-01
EU-155	#B	-6.0937E-03	-6.0989E-03	1.7118E+00	1.7118E+00	3.110E-01
HG-203	#B	9.0113E-03	9.3167E-03	5.0921E-02	5.0924E-02	5.569E-02
TL-208	#	2.9268E-01	2.9268E-01	9.4765E-02	9.6178E-02	
PB-212	#	6.7802E-01	6.7802E-01	1.5332E-01	1.5797E-01	1.366E-01
PB-214	#	4.9666E-01	4.9666E-01	1.3897E-01	1.4174E-01	1.104E-01
BI-212		8.1420E-01	8.1420E-01	6.2379E-01	6.2546E-01	
BI-214		5.1105E-01	5.1105E-01	1.5305E-01	1.5571E-01	
RA-224	#A	4.0095E-01	4.0095E-01	1.5088E+00	1.5090E+00	1.681E+00
RA-226	#A	1.1187E+00	1.1187E+00	1.3521E+00	1.3536E+00	1.466E+00
AC-228	F	2.8618E-01	2.8618E-01	1.4539E-01	1.4628E-01	2.529E-01
TH-227	#B	-2.3802E-01	-2.3802E-01	5.2739E-01	5.2756E-01	5.742E-01
PA-234	#B	5.2249E-02	5.2249E-02	6.3320E-02	6.3387E-02	2.596E-01
TH-234	#B	2.0619E+00	2.0619E+00	2.2751E+00	2.2780E+00	4.961E+00
AM-241	#A	-1.0244E-01	-1.0244E-01	6.6015E-01	6.6017E-01	7.385E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (270.7 to 1999.0 keV) 1.9040987E+00 pCi/gm
Total Decayed Activity (270.7 to 1999.0 keV) 1.9040987E+00 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JJM

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 102F_14SEPT2006_1800.An1

Sample description
FSS-OOL-05-08-009-F

Spectrum Filename: C:\GammaVision\Spectra\102F_14SEPT2006_1800.An1

Acquisition information

Start time:	14-Sep-2006 16:00:59
Live time:	2000
Real time:	2016
Dead time:	0.79 %
Detector ID:	3

Detector system
Det 102 - DSPP-468

Calibration
Filename: D2_1LSa.Clb
DET 102 1 Liter Sand Geometry

Energy Calibration

Created:	15-Jan-2005 03:09:29
Zero offset:	0.220 keV
Gain:	0.500 keV/channel
Quadratic:	-6.435E-08 keV/channel^2

Efficiency Calibration

Created:	15-Jan-2005 06:48:10
Type:	Polynomial
Uncertainty:	0.497 %
Coefficients:	-0.294180 -5.980622 0.744607
	-0.096737 0.005214 -0.000120

Library Files

Main analysis library:	FSS_Rev_1.Lib
Library Match Width:	1.000
Peak stripping:	Library based

Analysis parameters

Analysis engine:	Env32 G53W4.20
Start channel:	100 (50.22keV)
Stop channel:	4000 (1999.02keV)
Peak rejection level:	41.667%
Peak search sensitivity:	3
Sample Size:	1.4000E+03
Activity scaling factor:	1.0000E+06/(1.0000E+00* 1.4000E+03) = 7.1429E+02
Detection limit method:	Nureg 4.16
Random error:	1.0000000E+00
Systematic error:	1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	11-Sep-2006 12:55:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	102_150K_28APR05.Pbc 01-May-2005 05:27:47
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 11 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.5607

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
74.49	79.	28.87	1.10	8.868E-03	74.81	9.600	PBC<MDA	PB212
77.35	187.	13.56	1.10	9.723E-03	77.11	10.700	1.765E+00	PB214
					77.11	17.500	1.079E+00	PB212
186.28	82.	27.07	1.31	1.625E-02	185.99	3.280	1.401E+00	RA226
239.37	471.	7.83	1.14	1.377E-02	238.63	43.100	7.648E-01	PB212
295.84	93.	15.24	1.26	1.145E-02	295.22	19.200	4.079E-01	PB214
338.96	93.	22.91	1.44	1.004E-02	338.40	12.010	7.414E-01	AC228
352.69	188.	11.69	1.21	9.660E-03	351.99	37.100	5.051E-01	PB214
511.53	69.	21.86	1.10	6.695E-03	510.72	22.500	4.396E-01	TL208
584.06	117.	11.93	1.31	5.881E-03	583.14	86.000	2.224E-01	TL208
610.23	125.	13.04	1.50	5.641E-03	609.32	46.090	4.634E-01	BI214
662.58	30.	32.11	1.51	5.229E-03	661.62	84.620	6.478E-02	CS137
728.20	26.	33.82	1.55	4.794E-03	727.17	11.800	PBC<MDA	BI212
912.57	86.	12.77	1.14	3.916E-03	911.07	29.000	7.313E-01	AC228
969.24	69.	18.48	1.94	3.717E-03	968.90	17.460	1.025E+00	AC228
1120.71	49.	21.51	0.85	3.283E-03	1120.28	15.040	9.501E-01	BI214
1462.82	393.	5.19	1.67	2.618E-03				

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
148.52	74.88	234.	67.	0.033	104.38	1.098	BI-207	D
154.22	77.73	243.	173.	0.086	44.59	1.100	PB-214	D
478.37	239.37	619.	114.	0.057	97.15	1.142	PB-212	s
2926.54	1462.82	12.	387.	0.194	15.69	1.672	K-40	M

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.
M - Peak is close to a library peak.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-214	153.80	77.11	596.	158.	0.079	69.60	1.500D
PB-212	153.80	77.11	596.	158.	0.079	69.60	1.500D
RA-226	372.22	186.30	240.	91.	0.045	74.82	1.500
PB-212	477.51	238.94	282.	325.	0.162	27.54	1.500s
PB-214	591.33	295.84	109.	89.	0.045	58.93	1.500s
AC-228	677.59	338.96	112.	93.	0.046	68.72	1.441
PB-214	704.77	352.54	89.	161.	0.080	34.24	1.500s
TL-208	1022.83	511.53	50.	69.	0.034	65.57	1.104s
TL-208	1167.95	584.06	29.	117.	0.058	35.79	1.307
BI-214	1220.31	610.23	44.	125.	0.062	39.13	1.501
CS-137	1325.06	662.58	31.	30.	0.015	96.33	1.509s
BI-212	1456.35	728.20	27.	26.	0.013	101.47	1.554s
AC-228	1825.29	912.57	13.	86.	0.043	38.30	1.139s
AC-228	1938.69	969.24	26.	69.	0.034	55.44	1.935s
BI-214	2241.81	1120.71	18.	49.	0.024	64.54	0.849s

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	Peak MDA Value pCi/gm	COMMENTS
BE-7		-1.3056E-02					
			477.56	-1.306E-02	%(	4.560E-01 1.28E-01	G
K-40		1.9449E-01					
			1460.75	1.945E-01	%(P	2.946E-01 1.01E-01	G
MN-54		-6.9499E-03					
			834.81	-6.950E-03	&(P	5.994E-02 1.67E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CO-57	-1.0386E-02						
		122.07	-1.039E-02	%(	5.754E-02	1.71E-02	G K
		136.43	-6.788E-03	%	4.817E-01	1.42E-01	G
CO-60	-9.9176E-03						
		1332.51	-9.918E-03	%(P	7.538E-02	2.08E-02	G K
		1173.23	1.970E-02	%	7.987E-02	2.31E-02	G K
Sr-85	-1.4249E-02						
		514.00	-1.425E-02	&(	6.866E-02	2.01E-02	G
Kr-85	-3.1804E+02						
		513.99	-3.180E+02	&(	1.533E+03	4.50E+02	G
Y-88	-3.0287E-05						
		1836.01	-3.029E-05	%(P	3.401E-02	4.61E-03	G K
		898.02	9.829E-03	% P	5.699E-02	1.58E-02	G
NB-94	2.5272E-03						
		871.10	2.527E-03	%(	5.730E-02	1.56E-02	G K
		702.50	3.061E-03	&	5.380E-02	1.49E-02	G K
Ag-108M	-1.0190E-03						
		722.95	-1.019E-03	%(	4.653E-02	1.24E-02	G K
		614.37	-3.631E-02	% P	8.204E-02	2.47E-02	G
		433.93	3.968E-03	&	5.183E-02	1.48E-02	G
CD-109	-3.8169E-02						
		88.04	-3.817E-02	&(P	2.329E+00	6.89E-01	G
SN-113	-1.5332E-02						
		391.71	-1.533E-02	&(	8.300E-02	2.43E-02	G K
		255.04	-4.824E-01	&	2.230E+00	6.60E-01	G
SB-125	-3.0409E-02						
		427.95	-3.041E-02	%(P	1.527E-01	4.38E-02	G K
		600.77	-5.396E-02	& P	2.693E-01	7.72E-02	G
		636.15	-1.089E-03	& P	5.542E-01	1.55E-01	G
		463.51	2.166E-01	% P	4.825E-01	1.45E-01	G
		176.29	-2.081E-01	% P	7.561E-01	2.25E-01	G
I-131	1.6767E-02						
		364.48	1.677E-02	&(	6.600E-02	1.94E-02	G K
		636.97	0.000E+00	%	1.119E+00	3.13E-01	G
		284.29	3.078E-01	%	7.684E-01	2.31E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CS-134	3.0118E-03						
		604.66	3.012E-03	%(	4.334E-02	1.19E-02	G K
		795.76	1.965E-02	%	6.610E-02	1.93E-02	G
		569.29	6.089E-04	&	3.109E-01	8.58E-02	G
		801.84	-7.410E-03	% P	6.547E-01	1.78E-01	G
CS-137	6.4780E-02						
		661.62	6.478E-02	*(	6.216E-02	2.08E-02	G
CE-139	-1.1349E-02						
		165.85	-1.135E-02	%(P	6.063E-02	1.80E-02	G
EU-152	-4.2864E-02						
		121.78	-4.286E-02	%(P	1.740E-01	5.19E-02	G K
		344.30	-3.531E-02	&	1.808E-01	5.31E-02	G
		1408.08	1.791E-03	%	3.097E-01	8.03E-02	G
		964.00	3.435E-02	& P	4.235E-01	1.16E-01	G
		1112.07	0.000E+00	&	6.666E-01	1.85E-01	G
		778.90	-1.245E-03	% P	5.669E-01	1.58E-01	G
EU-154	-1.8646E-02						
		123.10	-1.865E-02	&(P	1.206E-01	3.58E-02	G K
		1274.80	-4.208E-02	&	2.376E-01	6.75E-02	G
		723.30	-1.145E-02	% P	2.592E-01	7.06E-02	G
		1004.80	1.481E-01	%	3.498E-01	1.05E-01	G
EU-155	1.3862E-01						
							Energy duplication
		86.45	1.386E-01	%(P	2.825E-01	8.56E-02	G K
		105.31	-1.880E-02	%	2.847E-01	8.43E-02	G
HG-203	2.3944E-02						
		279.17	2.394E-02	&(P	4.510E-02	1.38E-02	G K
		72.87	-6.082E-02	&	1.999E+00	5.92E-01	G
		70.83	0.000E+00	%	5.150E+00	1.53E+00	G
		82.50	8.718E-02	%	5.099E+00	1.51E+00	G
TL-208	2.2237E-01						
		583.14	2.224E-01	(P	5.324E-02	2.67E-02	G
		510.72	4.396E-01	+	2.294E-01	9.62E-02	G
PB-212	5.2684E-01						
		238.63	5.268E-01	@(	1.313E-01	4.84E-02	G K
							Energy duplication
		77.11	9.155E-01	+	6.732E-01	2.12E-01	G
		74.81	5.358E-01	& P	1.368E+00	4.13E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
PB-214	4.1830E-01						
		351.99	4.320E-01	@(P	1.254E-01	4.94E-02	G K
		295.22	3.918E-01	*(	2.256E-01	7.70E-02	G
							Energy duplication
		77.11	1.497E+00	+	1.101E+00	3.47E-01	G
		241.92	2.896E-01	%	8.089E-01	2.43E-01	G
BI-212	4.5158E-01						
		727.17	4.516E-01	*(	4.581E-01	1.53E-01	G K
		1620.56	2.872E-02	% P	1.626E+00	3.69E-01	G
		785.42	9.099E-01	% P	2.836E+00	8.33E-01	G
BI-214	4.6339E-01						
		609.32	4.634E-01	(	1.246E-01	6.05E-02	G K
		1764.51	-9.804E-02	% P	5.176E-01	1.44E-01	G
		1120.28	9.501E-01	+	4.437E-01	2.04E-01	G
RA-224	5.7702E-01						
		241.00	5.770E-01	%(P	1.549E+00	4.66E-01	G
RA-226	1.6460E+00						
		185.99	1.646E+00	(P	1.355E+00	4.31E-01	G
AC-228	7.3427E-01						
		911.07	7.313E-01	@(P	1.647E-01	9.38E-02	G K
		968.90	1.025E+00	+ P	3.939E-01	1.90E-01	G
		338.40	7.414E-01	(	4.160E-01	1.70E-01	G
TH-227	-9.6644E-02						
		236.00	-9.664E-02	%(P	4.861E-01	1.44E-01	G K
		256.25	-1.678E-01	&	6.486E-01	1.93E-01	G
PA-234	4.4152E-02						
		98.44	4.415E-02	%(	2.831E-01	8.44E-02	G K
		946.00	-2.002E-03	%	2.477E-01	6.49E-02	G
		131.28	8.615E-04	&	2.532E-01	7.46E-02	G
		94.67	-2.442E-01	%	5.638E-01	1.71E-01	G
		883.24	2.063E-02	%	5.232E-01	1.44E-01	G
		926.70	6.861E-03	&	5.089E-01	1.36E-01	G
		569.26	6.247E-04	&	4.601E-01	1.27E-01	G
TH-234	1.6636E+00						
		63.29	1.664E+00	%(P	5.484E+00	1.65E+00	G K
		92.80	1.312E+00	%	2.732E+00	8.29E-01	G
		92.38	1.448E+00	% P	3.136E+00	9.50E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
AM-241	-8.0440E-02						
		59.54	-8.044E-02	%(	7.960E-01	2.37E-01	G

(- This peak used in the nuclide activity average.

* - Peak is too wide, but only one peak in library.
! - Peak is part of a multiplet and this area went negative during deconvolution.
? - Peak is too narrow.
@ - Peak is too wide at FW25M, but ok at FWHM.
% - Peak fails sensitivity test.
$ - Peak identified, but first peak of this nuclide failed one or more qualification tests.
+ - Peak activity higher than counting uncertainty range.
- - Peak activity lower than counting uncertainty range.
= - Peak outside analysis energy range.
& - Calculated peak centroid is not close enough to the library energy centroid for positive identification.
P - Peakbackground subtraction
} - Peak is too close to another for the activity to be found directly.

Nuclide Codes:
T - Thermal Neutron Activation
F - Fast Neutron Activation
I - Fission Product
N - Naturally Occurring Isotope
P - Photon Reaction
C - Charged Particle Reaction
M - No MDA Calculation
R - Coincidence Corrected
H - Halflife limit exceeded

Peak Codes:
G - Gamma Ray
X - X-Ray
P - Positron Decay
S - Single-Escape
D - Double-Escape
K - Key Line
A - Not in Average
C - Coincidence Peak

- -

***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	-1.2537E-02	-1.3056E-02	3.8354E-01	3.8354E-01	4.378E-01
K-40	A	1.9449E-01	1.9449E-01	3.0372E-01	3.0392E-01	2.946E-01
MN-54	#A	-6.9018E-03	-6.9499E-03	5.7637E-02	5.7638E-02	5.952E-02
CO-57	#B	-1.0303E-02	-1.0386E-02	5.1340E-02	5.1344E-02	5.708E-02
CO-60	#B	-9.9065E-03	-9.9176E-03	6.5935E-02	6.5937E-02	7.530E-02
Sr-85	#A	-1.3780E-02	-1.4249E-02	6.0409E-02	6.0414E-02	6.640E-02
Kr-85	#A	-3.1803E+02	-3.1804E+02	1.3487E+03	1.3488E+03	1.533E+03
Y-88	#B	-2.9677E-05	-3.0287E-05	1.8172E-04	1.8173E-04	3.333E-02
NB-94	#B	2.5272E-03	2.5272E-03	4.6911E-02	4.6911E-02	5.730E-02
Ag-108M	#B	-1.0190E-03	-1.0190E-03	3.7178E-02	3.7178E-02	4.653E-02
CD-109	#A	-3.7987E-02	-3.8169E-02	1.9277E+01	1.9277E+01	2.318E+00

SN-113	#B	-1.5046E-02	-1.5332E-02	7.2907E-02	7.2912E-02	8.145E-02
SB-125	#B	-3.0344E-02	-3.0409E-02	1.7246E-01	1.7247E-01	1.524E-01
I-131	#B	1.2803E-02	1.6767E-02	5.8185E-02	5.8193E-02	5.040E-02
CS-134	#B	3.0031E-03	3.0118E-03	3.5822E-02	3.5823E-02	4.321E-02
CS-137	#	6.4767E-02	6.4780E-02	6.2403E-02	6.2509E-02	6.214E-02
CE-139	#A	-1.1172E-02	-1.1349E-02	5.7131E-02	5.7135E-02	5.968E-02
EU-152	#B	-4.2844E-02	-4.2864E-02	1.6882E-01	1.6883E-01	1.740E-01
EU-154	#B	-1.8633E-02	-1.8646E-02	1.1080E-01	1.1081E-01	1.206E-01
EU-155	#B	1.3845E-01	1.3862E-01	2.5681E-01	2.5692E-01	2.822E-01
HG-203	#B	2.2855E-02	2.3944E-02	4.1288E-02	4.1310E-02	4.305E-02
TL-208		2.2237E-01	2.2237E-01	7.9857E-02	8.0826E-02	
PB-212	#	5.2684E-01	5.2684E-01	1.4509E-01	1.4807E-01	1.313E-01
PB-214	#	4.1830E-01	4.1830E-01	1.4263E-01	1.4455E-01	1.254E-01
BI-212	#A	4.5158E-01	4.5158E-01	4.5824E-01	4.5894E-01	4.581E-01
BI-214		4.6339E-01	4.6339E-01	1.8132E-01	1.8317E-01	
RA-224	#A	5.7702E-01	5.7702E-01	1.3985E+00	1.3989E+00	1.549E+00
RA-226	#	1.6460E+00	1.6460E+00	1.2920E+00	1.2953E+00	1.355E+00
AC-228		7.3427E-01	7.3427E-01	2.8198E-01	2.8498E-01	
TH-227	#B	-9.6644E-02	-9.6644E-02	4.4938E-01	4.4941E-01	4.861E-01
PA-234	#B	4.4152E-02	4.4152E-02	2.5320E-01	2.5321E-01	2.831E-01
TH-234	#B	1.6636E+00	1.6636E+00	4.9441E+00	4.9449E+00	5.484E+00
AM-241	#A	-8.0439E-02	-8.0440E-02	7.0973E-01	7.0974E-01	7.960E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (81.7 to 1999.0 keV) 1.4200331E+00 pCi/gm
Total Decayed Activity (81.7 to 1999.0 keV) 1.4200331E+00 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JPK

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 103F_13SEPT2006_1417.An1

Sample description
FSS-OOL-05-08-012-F

Spectrum Filename: C:\GammaVision\Spectra\103F_13SEPT2006_1417.An1

Acquisition information
Start time: 13-Sep-2006 14:17:33
Live time: 2000
Real time: 2002
Dead time: 0.10 %
Detector ID: 4

Detector system
Det 103 - DSPE-471

Calibration
Filename: D3_1LSa.Clb
Detector_103 1.0 Liter Sand Geometry

Energy Calibration
Created: 08-Aug-2005 11:09:41
Zero offset: 0.409 keV
Gain: 0.500 keV/channel
Quadratic: 1.092E-08 keV/channel^2

Efficiency Calibration
Created: 08-Aug-2005 11:11:25
Type: Polynomial
Uncertainty: 0.993 %
Coefficients: -0.264059 -5.138468 0.638383
-0.089199 0.005011 -0.000129

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.41keV)
Stop channel: 4000 (2000.67keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 1.7370E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.7370E+03) =
5.7571E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	12-Sep-2006 14:05:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	103_150K_05AUG05.Pbc 08-Aug-2005 12:54:15
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 14 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.1083

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
74.97	100.	25.73	0.99	9.052E-03	74.81	9.600	8.984E-01	PB212
77.27	135.	17.65	0.99	1.011E-02	77.11	17.500	8.404E-01	PB212
					77.11	10.700	1.375E+00	PB214
93.27	84.	34.08	1.13	1.661E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
186.33	180.	21.60	1.23	2.566E-02	185.99	3.280	1.544E+00	RA226
209.01	75.	39.28	0.93	2.473E-02				
238.65	630.	5.94	1.50	2.302E-02	238.63	43.100	4.811E-01	PB212
					241.92	7.470	2.851E+00	PB214
238.73	984.	3.69	1.09	2.320E-02	238.63	43.100	7.560E-01	PB212
					241.92	7.470	4.449E+00	PB214
270.13	100.	25.39	1.36	2.152E-02				
295.23	192.	10.83	1.13	2.025E-02	295.22	19.200	3.765E-01	PB214
299.63	56.	30.66	1.13	2.003E-02				
327.89	63.	36.90	1.21	1.875E-02				
338.32	188.	12.02	1.10	1.830E-02	338.40	12.010	6.630E-01	AC228
351.90	406.	7.51	0.94	1.776E-02	351.99	37.100	4.731E-01	PB214
410.11	38.	41.27	0.85	1.573E-02				
463.06	67.	29.06	1.26	1.426E-02				
463.06	67.	29.06	1.26	1.426E-02	463.51	10.000	3.592E-01	SB125
510.82	136.	18.44	0.96	1.317E-02	510.72	22.500	2.870E-01	TL208
583.23	342.	6.97	1.26	1.184E-02	583.14	86.000	2.577E-01	TL208
609.29	300.	8.68	1.58	1.144E-02	609.32	46.090	4.324E-01	BI214
727.49	77.	21.86	1.47	9.961E-03	727.17	11.800	5.035E-01	BI212
795.10	42.	26.62	1.50	9.301E-03	795.76	85.400	4.083E-02	CS134
860.72	86.	25.21	0.90	8.766E-03				
911.28	226.	8.20	1.69	8.400E-03	911.07	29.000	7.093E-01	AC228

963.91	39.	30.16	1.54	8.056E-03				
963.91	39.	30.16	1.54	8.056E-03	964.00	14.580	PBC<MDA	EU152
969.18	112.	12.44	1.54	8.024E-03	968.90	17.460	6.184E-01	AC228
1120.49	72.	24.51	2.07	7.212E-03	1120.28	15.040	5.158E-01	BI214
1461.00	1240.	2.88	1.75	5.931E-03	1460.75	10.700	1.497E+01	K40
1764.79	64.	13.27	1.10	5.141E-03	1764.51	15.920	5.819E-01	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide
417.19	209.01	356.	75.	0.037	117.84	0.934	AC-228
483.13	241.92	220.	130.	0.065	55.19	1.095	PB-214 lD
539.40	270.13	235.	100.	0.050	76.18	1.356	AC-228 s
598.43	299.64	150.	60.	0.030	94.87	1.314	TH-227 M
654.93	327.89	202.	63.	0.032	110.69	1.206	AC-228
819.36	410.11	99.	38.	0.019	123.80	0.850	AC-228 s
1720.49	860.72	88.	87.	0.043	55.96	0.902	TL-208 s

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.
M - Peak is close to a library peak.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-212	148.79	74.81	306.	100.	0.050	77.19	0.993D
PB-212	153.39	77.11	332.	135.	0.067	52.96	0.995A
RA-226	371.63	186.23	579.	142.	0.071	69.66	1.500s
PB-212	476.87	238.86	594.	1041.	0.521	15.22	1.106
RA-224	482.36	241.60	505.	132.	0.066	76.66	1.500
PB-214	476.45	238.65	386.	630.	0.315	17.82	1.500s
PB-214	589.63	295.24	215.	179.	0.090	42.27	1.104
AC-228	675.78	338.32	149.	187.	0.094	36.07	1.103
PB-214	702.94	351.90	199.	401.	0.200	22.52	0.945
SB-125	925.20	463.04	119.	60.	0.030	84.70	1.500
TL-208	1020.74	510.82	181.	109.	0.055	55.31	0.959s
TL-208	1165.56	583.23	88.	337.	0.169	20.90	1.263
BI-214	1217.68	609.29	114.	293.	0.147	26.04	1.576
BI-212	1454.05	727.49	79.	76.	0.038	65.59	1.466
CS-134	1589.25	795.10	41.	42.	0.021	79.87	1.500s
AC-228	1821.59	911.28	50.	222.	0.111	24.59	1.689
EU-152	1928.53	964.76	79.	41.	0.021	101.11	1.538
AC-228	1937.00	968.99	103.	164.	0.082	42.56	1.803
BI-214	2239.96	1120.49	81.	72.	0.036	73.54	2.072s
K-40	2920.86	1461.00	31.	1222.	0.611	8.64	1.754
BI-214	3528.34	1764.79	6.	61.	0.031	39.81	1.095s

s - Peak fails shape tests.
D - Peak area deconvoluted.

A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Code	MDA Value pCi/gm		COMMENTS
BE-7		5.3452E-02						
			477.56	5.345E-02	&(	3.159E-01	9.29E-02	G
K-40		1.4974E+01						
			1460.75	1.497E+01	(P	3.529E-01	4.38E-01	G
MN-54		2.1701E-02						
			834.81	2.170E-02	%(P	2.922E-02	9.22E-03	G
CO-57		-6.5489E-04						
			122.07	-6.549E-04	&(P	4.944E-02	1.47E-02	G K
			136.43	3.969E-02	&	3.913E-01	1.17E-01	G
CO-60		-4.5968E-03						
			1332.51	-4.597E-03	%(P	3.651E-02	9.75E-03	G K
			1173.23	4.610E-03	% P	4.147E-02	1.18E-02	G K
Sr-85		-1.5845E-02						
			514.00	-1.584E-02	&(	4.279E-02	1.29E-02	G
Kr-85		-3.6189E+02						
			513.99	-3.619E+02	&(	9.772E+02	2.94E+02	G
Y-88		2.2068E-03						
			1836.01	2.207E-03	%(P	2.801E-02	7.43E-03	G K
			898.02	-8.351E-03	& P	4.152E-02	1.21E-02	G
NB-94		-5.3480E-03						
			871.10	-5.348E-03	&(	3.140E-02	9.06E-03	G K
			702.50	4.501E-03	%	3.871E-02	1.13E-02	G K
Ag-108M		-1.1501E-03						
			722.95	-1.150E-03	&(	3.160E-02	8.94E-03	G K
			614.37	-3.610E-03	& P	3.382E-02	9.77E-03	G
			433.93	-1.252E-02	%	3.838E-02	1.15E-02	G
CD-109		5.0575E-01						
			88.04	5.057E-01	&(	1.741E+00	5.24E-01	G
SN-113		6.7187E-03						
			391.71	6.719E-03	&(	4.409E-02	1.30E-02	G K
			255.04	-1.804E-02	%	1.596E+00	4.71E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	8.7320E-02						
		427.95	6.467E-03	&(P	1.034E-01	3.01E-02	G K
		600.77	9.414E-03	% P	1.685E-01	4.85E-02	G
		636.15	4.123E-02	% P	2.586E-01	7.49E-02	G
		463.51	3.266E-01	(P	2.929E-01	9.42E-02	G
		176.29	1.759E-01	%	5.463E-01	1.64E-01	G
I-131	-1.1683E-02						
		364.48	-1.168E-02	%(P	3.948E-02	1.18E-02	G K
		636.97	5.543E-02	&	4.818E-01	1.40E-01	G
		284.29	-9.155E-02	% P	5.896E-01	1.75E-01	G
CS-134	1.8660E-02						
		604.66	-7.379E-04	%(	7.238E-02	2.14E-02	G K
		795.76	4.083E-02	(P	3.189E-02	1.09E-02	G
		569.29	-2.983E-02	& P	2.316E-01	6.71E-02	G
		801.84	1.423E-01	% P	3.330E-01	9.95E-02	G
CS-137	2.3115E-02						
		661.62	2.312E-02	%(P	3.842E-02	1.18E-02	G
CE-139	2.4447E-04						
		165.85	2.445E-04	&(	4.076E-02	1.21E-02	G
EU-152	8.4403E-02						
		121.78	-1.018E-02	&(P	1.439E-01	4.28E-02	G K
		344.30	1.823E-02	& P	1.104E-01	3.26E-02	G
		1408.08	5.381E-02	%	1.227E-01	3.70E-02	G
		964.00	2.741E-01	&(P	2.930E-01	9.36E-02	G
		1112.07	4.061E-02	%	2.754E-01	7.91E-02	G
		778.90	-1.992E-02	%	2.569E-01	7.36E-02	G
EU-154	3.5494E-03						
		123.10	3.549E-03	%(	1.032E-01	3.07E-02	G K
		1274.80	1.736E-02	&	9.880E-02	2.83E-02	G
		723.30	1.184E-02	&	1.349E-01	3.83E-02	G
		1004.80	3.905E-02	%	1.973E-01	5.72E-02	G
EU-155	1.6735E-02						
		86.45	1.673E-02	%(	1.937E-01	5.76E-02	G K
		105.31	6.143E-02	%	2.176E-01	6.54E-02	G
HG-203	1.1871E-02						
		279.17	1.187E-02	&(P	3.733E-02	1.12E-02	G K
		72.87	-6.650E-01	& P	2.185E+00	6.58E-01	G
		70.83	-6.188E-01	%	4.090E+00	1.22E+00	G
		82.50	-7.768E-01	%	3.883E+00	1.16E+00	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	2.6376E-01						
		583.14	2.577E-01	(P	3.538E-02	1.82E-02	G
		510.72	2.870E-01	*(P	1.715E-01	6.58E-02	G
PB-212	8.2983E-01						
		238.63	8.102E-01	(P	9.045E-02	4.16E-02	G K
							Energy duplication
		77.11	5.920E-01	} P	3.850E-01	1.05E-01	G
		74.81	8.984E-01	(P	7.537E-01	2.38E-01	G
PB-214	4.7314E-01						
		351.99	4.731E-01	(P	8.094E-02	3.60E-02	G K
		295.22	3.589E-01	- P	1.420E-01	5.17E-02	G
							Energy duplication
		77.11	3.621E-01	} P	9.292E-01	2.27E-01	G
		241.92	2.851E+00	+	4.263E-01	1.69E-01	G
BI-212	5.0354E-01						
		727.17	5.035E-01	(P	2.918E-01	1.11E-01	G K
		1620.56	2.500E-01	% P	9.542E-01	2.72E-01	G
		785.42	8.420E-01	%	1.694E+00	5.15E-01	G
BI-214	4.5290E-01						
		609.32	4.324E-01	(P	7.741E-02	3.84E-02	G K
		1764.51	5.819E-01	+ P	1.322E-01	8.14E-02	G
		1120.28	5.158E-01	(P	3.204E-01	1.30E-01	G
RA-224	1.1437E+00						
		241.00	1.144E+00	(	9.290E-01	2.92E-01	G
RA-226	1.3079E+00						
		185.99	1.308E+00	*(P	1.061E+00	3.31E-01	G
AC-228	6.9575E-01						
		911.07	7.093E-01	(P	1.137E-01	5.90E-02	G K
		968.90	9.119E-01	+ P	2.773E-01	1.30E-01	G
		338.40	6.630E-01	(P	2.107E-01	8.02E-02	G
TH-227	1.2503E-03						
		236.00	1.250E-03	%(	3.007E-01	8.88E-02	G K
		256.25	6.107E-02	& P	4.369E-01	1.30E-01	G
PA-234	-2.4623E-02						
		98.44	-2.462E-02	&(P	2.180E-01	6.50E-02	G K
		946.00	4.734E-02	% P	1.812E-01	5.32E-02	G
		131.28	4.202E-02	& P	2.062E-01	6.18E-02	G
		94.67	1.017E-03	% P	3.857E-01	1.15E-01	G
		883.24	0.000E+00	&	2.714E-01	7.62E-02	G
		926.70	4.408E-02	%	2.974E-01	8.55E-02	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26-4.419E-02 & P 3.432E-01 9.95E-02 G

TH-234       3.4527E-01
                           63.29 3.453E-01 %(P 6.403E+00 1.90E+00 G K
                           92.80 1.486E+00 % P 2.076E+00 6.32E-01 G
                           92.38-3.473E-01 % P 2.435E+00 7.15E-01 G

AM-241       2.5979E-01
                           59.54 2.598E-01 &(P 9.924E-01 2.98E-01 G
```

(- This peak used in the nuclide activity average.

* - Peak is too wide, but only one peak in library.
! - Peak is part of a multiplet and this area went negative during deconvolution.
? - Peak is too narrow.
@ - Peak is too wide at FW25M, but ok at FWHM.
% - Peak fails sensitivity test.
$ - Peak identified, but first peak of this nuclide failed one or more qualification tests.
\+ - Peak activity higher than counting uncertainty range.
\- - Peak activity lower than counting uncertainty range.
= - Peak outside analysis energy range.
& - Calculated peak centroid is not close enough to the library energy centroid for positive identification.
P - Peakbackground subtraction
} - Peak is too close to another for the activity to be found directly.

Nuclide Codes:	Peak Codes:
T - Thermal Neutron Activation	G - Gamma Ray
F - Fast Neutron Activation	X - X-Ray
I - Fission Product	P - Positron Decay
N - Naturally Occurring Isotope	S - Single-Escape
P - Photon Reaction	D - Double-Escape
C - Charged Particle Reaction	K - Key Line
M - No MDA Calculation	A - Not in Average
R - Coincidence Corrected	C - Coincidence Peak
H - Halflife limit exceeded	

\- -

***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	5.2757E-02	5.3452E-02	2.7881E-01	2.7883E-01	3.118E-01
K-40		1.4974E+01	1.4974E+01	1.3133E+00	1.5750E+00	
MN-54	#A	2.1653E-02	2.1701E-02	2.7669E-02	2.7698E-02	2.915E-02
CO-57	#B	-6.5319E-04	-6.5489E-04	7.4340E-02	7.4340E-02	4.931E-02
CO-60	#B	-4.5951E-03	-4.5968E-03	1.6973E-01	1.6973E-01	3.650E-02

Sr-85	#A	-1.5675E-02	-1.5845E-02	3.8596E-02	3.8607E-02	4.233E-02
Kr-85	#A	-3.6188E+02	-3.6189E+02	8.8148E+02	8.8173E+02	9.772E+02
Y-88	#B	2.1924E-03	2.2068E-03	2.2283E-02	2.2284E-02	2.783E-02
NB-94	#B	-5.3480E-03	-5.3480E-03	2.7181E-02	2.7182E-02	3.140E-02
Ag-108M	#B	-1.1501E-03	-1.1501E-03	2.6819E-02	2.6819E-02	3.160E-02
CD-109	#A	5.0497E-01	5.0575E-01	1.5706E+00	1.5708E+00	1.738E+00
SN-113	#B	6.6781E-03	6.7187E-03	3.8883E-02	3.8885E-02	4.382E-02
SB-125	#B	8.7259E-02	8.7320E-02	7.5535E-02	7.5705E-02	1.033E-01
I-131	#B	-1.0710E-02	-1.1683E-02	3.7858E-02	3.7864E-02	3.619E-02
CS-134	#B	1.8643E-02	1.8660E-02	1.4935E-02	1.4974E-02	7.232E-02
CS-137	#A	2.3114E-02	2.3115E-02	3.5342E-02	3.5367E-02	3.841E-02
CE-139	#A	2.4323E-04	2.4447E-04	3.6196E-02	3.6196E-02	4.055E-02
EU-152	#B	8.4390E-02	8.4403E-02	8.6465E-02	8.6591E-02	1.439E-01
EU-154	#B	3.5486E-03	3.5494E-03	9.2121E-02	9.2121E-02	1.032E-01
EU-155	#B	1.6728E-02	1.6735E-02	1.7293E-01	1.7294E-01	1.936E-01
HG-203	#B	1.1695E-02	1.1871E-02	3.3590E-02	3.3597E-02	3.677E-02
TL-208		2.6376E-01	2.6376E-01	5.5825E-02	5.7887E-02	
PB-212		8.2983E-01	8.2983E-01	1.2777E-01	1.3656E-01	
PB-214		4.7314E-01	4.7314E-01	1.0803E-01	1.1147E-01	
BI-212		5.0354E-01	5.0354E-01	3.3240E-01	3.3368E-01	
BI-214		4.5290E-01	4.5290E-01	1.2053E-01	1.2337E-01	
RA-224	#	1.1437E+00	1.1437E+00	8.7674E-01	8.7925E-01	9.290E-01
RA-226	#	1.3079E+00	1.3079E+00	9.9443E-01	9.9733E-01	1.061E+00
AC-228		6.9575E-01	6.9575E-01	1.5321E-01	1.5844E-01	
TH-227	#B	1.2503E-03	1.2503E-03	2.6652E-01	2.6652E-01	3.007E-01
PA-234	#B	-2.4623E-02	-2.4623E-02	2.2360E-01	2.2361E-01	2.180E-01
TH-234	#B	3.4527E-01	3.4527E-01	5.7008E+00	5.7008E+00	6.403E+00
AM-241	#A	2.5979E-01	2.5979E-01	8.9250E-01	8.9262E-01	9.924E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (81.4 to 2000.7 keV) 1.8193007E+01 pCi/gm
Total Decayed Activity (81.4 to 2000.7 keV) 1.8193007E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JPK

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 103F_14SEPT2006_1531.An1

Sample description
FSS-OOL-05-08-008-F

Spectrum Filename: C:\GammaVision\Spectra\103F_14SEPT2006_1531.An1

Acquisition information
Start time: 14-Sep-2006 15:31:53
Live time: 2000
Real time: 2001
Dead time: 0.07 %
Detector ID: 4

Detector system
Det 103 - DSPE-471

Calibration
Filename: D3_1LSa.Clb
Detector_103 1.0 Liter Sand Geometry

Energy Calibration
Created: 08-Aug-2005 11:09:41
Zero offset: 0.409 keV
Gain: 0.500 keV/channel
Quadratic: 1.092E-08 keV/channel^2

Efficiency Calibration
Created: 08-Aug-2005 11:11:25
Type: Polynomial
Uncertainty: 0.993 %
Coefficients: -0.264059 -5.138468 0.638383
-0.089199 0.005011 -0.000129

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.41keV)
Stop channel: 4000 (2000.67keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 1.2930E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.2930E+03) =
7.7340E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	11-Sep-2006 13:00:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	103_150K_05AUG05.Pbc 08-Aug-2005 12:54:15
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 17 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.1630

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
74.82	111.	19.44	0.99	9.013E-03	74.81	9.600	1.298E+00	PB212
77.33	143.	15.62	0.99	1.017E-02	77.11	17.500	8.269E-01	PB212
					77.11	10.700	1.352E+00	PB214
87.04	54.	40.22	1.00	1.440E-02	86.45	32.740	1.231E-01	EU155
					88.04	3.790	1.022E+00	CD109
93.32	61.	35.07	1.00	1.668E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
129.11	57.	41.26	0.77	2.437E-02				
185.98	87.	24.28	1.23	2.567E-02				
185.98	87.	24.28	1.23	2.567E-02	185.99	3.280	PBC<MDA	RA226
210.17	70.	33.91	0.82	2.467E-02				
238.74	643.	4.62	1.09	2.319E-02	238.63	43.100	6.596E-01	PB212
241.73	103.	19.59	1.09	2.303E-02	241.00	3.900	1.202E+00	RA224
					241.92	7.470	6.287E-01	PB214
270.72	93.	25.94	1.67	2.149E-02				
295.27	152.	15.52	1.04	2.025E-02	295.22	19.200	3.964E-01	PB214
300.36	54.	35.83	1.34	2.000E-02				
338.61	129.	20.21	1.47	1.829E-02	338.40	12.010	6.063E-01	AC228
351.70	289.	9.17	1.17	1.776E-02	351.99	37.100	4.496E-01	PB214
511.26	115.	17.16	1.47	1.316E-02	510.72	22.500	3.108E-01	TL208
583.21	221.	8.54	1.38	1.184E-02	583.14	86.000	2.223E-01	TL208
609.47	208.	9.22	1.60	1.144E-02	609.32	46.090	4.005E-01	BI214
661.62	71.	30.86	1.28	1.072E-02	661.62	84.620	7.997E-02	CS137
727.22	57.	22.90	1.55	9.964E-03	727.17	11.800	5.005E-01	BI212
911.47	120.	11.64	1.93	8.399E-03	911.07	29.000	5.003E-01	AC228
968.49	139.	14.27	1.51	8.028E-03	968.90	17.460	1.037E+00	AC228
1120.69	73.	19.49	1.95	7.210E-03	1120.28	15.040	6.842E-01	BI214

1461.15	724.	3.81	2.02	5.931E-03	1460.75	10.700	1.161E+01	K40
1765.11	32.	18.43	0.81	5.142E-03	1764.51	15.920	4.140E-01	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
173.26	87.20	211.	54.	0.027	120.66	1.001	PB-214	lD
257.38	129.11	243.	62.	0.031	112.72	0.766	AC-228	s
419.50	210.17	213.	70.	0.035	101.72	0.818	NP-239	s
540.59	270.72	180.	93.	0.046	77.81	1.669	AC-228	s
599.87	300.36	136.	54.	0.027	107.49	1.341	PB-212	

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-212	148.79	74.81	180.	111.	0.055	57.07	0.993D
PB-212	153.39	77.11	180.	100.	0.050	54.64	0.995A
RA-226	371.16	186.00	392.	83.	0.042	91.26	1.500
PB-212	476.73	238.79	450.	564.	0.282	21.59	1.055
RA-224	482.42	241.63	404.	103.	0.051	88.30	1.500
PB-214	589.69	295.27	165.	147.	0.074	46.56	1.042
AC-228	676.37	338.61	177.	128.	0.064	60.63	1.465s
PB-214	702.53	351.70	144.	283.	0.142	27.52	1.170s
TL-208	1021.63	511.26	115.	88.	0.044	51.49	1.467s
TL-208	1165.52	583.21	58.	217.	0.108	25.61	1.376s
BI-214	1218.04	609.47	66.	202.	0.101	27.65	1.605s
CS-137	1322.33	661.62	101.	69.	0.035	92.59	1.276
BI-212	1453.51	727.22	44.	56.	0.028	68.69	1.552s
AC-228	1821.97	911.47	33.	117.	0.058	34.91	1.934s
AC-228	1935.99	968.49	61.	139.	0.070	42.81	1.509s
BI-214	2240.36	1120.69	41.	71.	0.036	58.48	1.948
K-40	2921.16	1461.15	28.	705.	0.352	11.44	2.021
BI-214	3528.97	1765.11	6.	32.	0.016	55.29	0.812s

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	MDA Value pCi/gm	COMMENTS
BE-7		-3.0908E-02					
			477.56	-3.091E-02	&(	2.471E-01 7.04E-02	G
K-40		1.1608E+01					
			1460.75	1.161E+01	(P	4.508E-01 4.55E-01	G
MN-54		-1.5299E-02					
			834.81	-1.530E-02	%(P	4.620E-02 1.37E-02	G
CO-57		9.4138E-03					
			122.07	9.414E-03	&(P	5.168E-02 1.54E-02	G K
			136.43	6.287E-02	&	3.957E-01 1.18E-01	G
CO-60		-1.0681E-02					
			1332.51	-1.068E-02	%(P	4.105E-02 1.09E-02	G K
			1173.23	-1.064E-02	& P	5.174E-02 1.46E-02	G K
Sr-85		-9.9396E-03					
			514.00	-9.940E-03	%(	4.462E-02 1.32E-02	G
Kr-85		-2.2195E+02					
			513.99	-2.219E+02	%(	9.964E+02 2.94E+02	G
Y-88		-1.3558E-04					
			1836.01	-1.356E-04	%(P	3.524E-02 8.89E-03	G K
			898.02	-8.438E-04	% P	4.756E-02 1.33E-02	G
NB-94		-5.0324E-03					
			871.10	-5.032E-03	%(	3.072E-02 8.69E-03	G K
			702.50	1.067E-02	%	3.214E-02 9.50E-03	G K
Ag-108M		-1.4536E-02					
			722.95	-1.454E-02	%(	5.109E-02 1.51E-02	G K
			614.37	-5.607E-03	% P	4.427E-02 1.28E-02	G
			433.93	3.556E-03	&	3.898E-02 1.13E-02	G
CD-109		9.8684E-01					
			88.04	9.868E-01	%(	1.961E+00 5.95E-01	G
SN-113		1.4388E-02					
			391.71	1.439E-02	%(	5.713E-02 1.69E-02	G K
			255.04	0.000E+00	&	1.860E+00 5.45E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	-1.8159E-02						
		427.95	-1.816E-02	%(P	1.179E-01	3.45E-02	G K
		600.77	5.168E-03	% P	2.176E-01	6.22E-02	G
		636.15	-5.540E-02	& P	3.494E-01	1.01E-01	G
		463.51	2.164E-01	% P	3.278E-01	1.01E-01	G
		176.29	1.848E-02	%	6.099E-01	1.80E-01	G
I-131	-1.0432E-02						
		364.48	-1.043E-02	&(P	5.904E-02	1.74E-02	G K
		636.97	-5.991E-03	%	5.933E-01	1.66E-01	G
		284.29	4.450E-02	% P	7.190E-01	2.10E-01	G
CS-134	2.9275E-03						
		604.66	2.928E-03	&(	3.616E-02	1.03E-02	G K
		795.76	1.289E-03	% P	4.328E-02	1.21E-02	G
		569.29	-5.463E-03	% P	2.326E-01	6.53E-02	G
		801.84	4.026E-02	& P	4.427E-01	1.25E-01	G
CS-137	7.9971E-02						
		661.62	7.997E-02	(P	5.697E-02	2.52E-02	G
CE-139	1.0983E-02						
		165.85	1.098E-02	%(	4.952E-02	1.48E-02	G
EU-152	2.6644E-02						
		121.78	2.664E-02	&(P	1.505E-01	4.49E-02	G K
		344.30	-2.597E-02	% P	1.255E-01	3.71E-02	G
		1408.08	6.261E-02	%	1.656E-01	4.91E-02	G
		964.00	1.110E-01	% P	3.720E-01	1.10E-01	G
		1112.07	5.447E-03	&	3.326E-01	9.25E-02	G
		778.90	5.927E-02	%	2.471E-01	7.16E-02	G
EU-154	3.2356E-03						
		123.10	3.236E-03	%(	1.109E-01	3.28E-02	G K
		1274.80	8.488E-03	&	1.182E-01	3.28E-02	G
		723.30	8.349E-02	%	1.445E-01	4.47E-02	G
		1004.80	-8.744E-03	%	1.405E-01	3.73E-02	G
EU-155	1.2544E-01						
		86.45	1.254E-01	%(	2.479E-01	7.53E-02	G K
		105.31	1.858E-03	%	2.599E-01	7.70E-02	G
HG-203	-7.6372E-03						
		279.17	-7.637E-03	&(P	4.665E-02	1.38E-02	G K
		72.87	-7.159E-01	% P	2.364E+00	7.10E-01	G
		70.83	2.448E-01	&	4.719E+00	1.40E+00	G
		82.50	1.355E-01	%	4.115E+00	1.22E+00	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	2.2233E-01						
		583.14	2.223E-01	@(P	3.929E-02	1.94E-02	G
		510.72	3.108E-01	+ P	1.857E-01	6.95E-02	G
PB-212	5.8915E-01						
		238.63	5.891E-01	(P	1.062E-01	4.33E-02	G K
							Energy duplication
		77.11	5.891E-01	} P	3.849E-01	1.07E-01	G
		74.81	1.331E+00	+ P	7.854E-01	2.60E-01	G
PB-214	4.3148E-01						
		351.99	4.496E-01	@(P	9.292E-02	4.21E-02	G K
		295.22	3.964E-01	(P	1.680E-01	6.32E-02	G
							Energy duplication
		77.11	3.179E-02	} P	8.751E-01	2.37E-01	G
		241.92	4.378E-01	%	6.120E-01	1.88E-01	G
BI-212	5.0046E-01						
		727.17	5.005E-01	(P	2.979E-01	1.16E-01	G K
		1620.56	1.413E-01	& P	1.208E+00	3.25E-01	G
		785.42	9.235E-01	%	1.660E+00	5.11E-01	G
BI-214	4.0396E-01						
		609.32	4.005E-01	(P	8.040E-02	3.81E-02	G K
		1764.51	4.140E-01	(P	1.750E-01	8.40E-02	G
		1120.28	6.842E-01	+ P	3.136E-01	1.37E-01	G
RA-224	1.1911E+00						
		241.00	1.191E+00	(	1.120E+00	3.51E-01	G
RA-226	1.0324E+00						
		185.99	1.032E+00	(P	1.180E+00	3.63E-01	G
AC-228	5.3136E-01						
		911.07	5.003E-01	*(P	1.271E-01	5.99E-02	G K
		968.90	1.037E+00	+ P	2.915E-01	1.48E-01	G
		338.40	6.063E-01	(P	3.081E-01	1.24E-01	G
TH-227	-2.0211E-01						
		236.00	-2.021E-01	&(	4.492E-01	1.36E-01	G K
		256.25	1.168E-01	& P	4.837E-01	1.44E-01	G
PA-234	-2.9147E-02						
		98.44	-2.915E-02	%(P	2.406E-01	7.15E-02	G K
		946.00	2.795E-02	& P	2.127E-01	6.08E-02	G
		131.28	-3.142E-02	& P	2.207E-01	6.57E-02	G
		94.67	-5.878E-02	& P	4.063E-01	1.21E-01	G
		883.24	-3.510E-02	%	2.985E-01	8.44E-02	G
		926.70	-1.231E-02	%	4.593E-01	1.30E-01	G

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 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26-8.715E-03 % P 3.442E-01 9.66E-02 G

TH-234       2.3205E-01
                           63.29 2.321E-01 %(P 5.946E+00 1.74E+00 G K
                           92.80 1.278E+00 % P 2.273E+00 6.86E-01 G
                           92.38 1.486E+00 & P 2.703E+00 8.16E-01 G

AM-241      -4.3773E-01
                           59.54-4.377E-01 %(P 1.163E+00 3.50E-01 G
   ( - This peak used in the nuclide activity average.

   * - Peak is too wide, but only one peak in library.
   ! - Peak is part of a multiplet and this area went
       negative during deconvolution.
   ? - Peak is too narrow.
   @ - Peak is too wide at FW25M, but ok at FWHM.
   % - Peak fails sensitivity test.
   $ - Peak identified, but first peak of this nuclide
       failed one or more qualification tests.
   + - Peak activity higher than counting uncertainty range.
   - - Peak activity lower than counting uncertainty range.
   = - Peak outside analysis energy range.
   & - Calculated peak centroid is not close enough to the
       library energy centroid for positive identification.
   P - Peakbackground subtraction
   } - Peak is too close to another for the activity
       to be found directly.

   Nuclide Codes:                      Peak Codes:
   T - Thermal Neutron Activation      G - Gamma Ray
   F - Fast Neutron Activation         X - X-Ray
   I - Fission Product                 P - Positron Decay
   N - Naturally Occurring Isotope     S - Single-Escape
   P - Photon Reaction                 D - Double-Escape
   C - Charged Particle Reaction       K - Key Line
   M - No MDA Calculation              A - Not in Average
   R - Coincidence Corrected           C - Coincidence Peak
   H - Halflife limit exceeded

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***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	-2.9687E-02	-3.0908E-02	2.1130E-01	2.1131E-01	2.374E-01
K-40		1.1608E+01	1.1608E+01	1.3634E+00	1.5209E+00	
MN-54	#A	-1.5194E-02	-1.5299E-02	4.3332E-02	4.3341E-02	4.588E-02
CO-57	#B	9.3390E-03	9.4138E-03	4.6233E-02	4.6236E-02	5.127E-02
CO-60	#B	-1.0669E-02	-1.0681E-02	7.8007E-02	7.8009E-02	4.100E-02

Sr-85	#A	-9.6150E-03	-9.9396E-03	3.9525E-02	3.9529E-02	4.316E-02
Kr-85	#A	-2.2194E+02	-2.2195E+02	8.8268E+02	8.8277E+02	9.964E+02
Y-88	#B	-1.3286E-04	-1.3558E-04	3.3598E-03	3.3598E-03	3.454E-02
NB-94	#B	-5.0324E-03	-5.0324E-03	2.6067E-02	2.6068E-02	3.072E-02
Ag-108M	#B	-1.4536E-02	-1.4536E-02	4.5361E-02	4.5369E-02	5.109E-02
CD-109	#A	9.8216E-01	9.8684E-01	1.7862E+00	1.7870E+00	1.951E+00
SN-113	#B	1.4121E-02	1.4388E-02	5.0820E-02	5.0827E-02	5.608E-02
SB-125	#B	-1.8121E-02	-1.8159E-02	1.0443E-01	1.0444E-01	1.177E-01
I-131	#B	-7.9815E-03	-1.0432E-02	5.9165E-02	5.9168E-02	4.517E-02
CS-134	#B	2.9192E-03	2.9275E-03	3.1020E-02	3.1021E-02	3.606E-02
CS-137		7.9955E-02	7.9971E-02	7.5529E-02	7.5672E-02	
CE-139	#A	1.0812E-02	1.0983E-02	4.4403E-02	4.4408E-02	4.876E-02
EU-152	#B	2.6631E-02	2.6644E-02	1.3458E-01	1.3459E-01	1.505E-01
EU-154	#B	3.2334E-03	3.2356E-03	9.8422E-02	9.8423E-02	1.108E-01
EU-155	#B	1.2529E-01	1.2544E-01	2.2587E-01	2.2597E-01	2.476E-01
HG-203	#B	-7.2923E-03	-7.6372E-03	4.1689E-02	4.1692E-02	4.454E-02
TL-208	#	2.2233E-01	2.2233E-01	5.8075E-02	5.9493E-02	
PB-212		5.8915E-01	5.8915E-01	1.2988E-01	1.3431E-01	
PB-214		4.3148E-01	4.3148E-01	1.1966E-01	1.2225E-01	
BI-212	#	5.0046E-01	5.0046E-01	3.4677E-01	3.4798E-01	
BI-214		4.0396E-01	4.0396E-01	1.1525E-01	1.1761E-01	
RA-224		1.1911E+00	1.1911E+00	1.0518E+00	1.0540E+00	1.120E+00
RA-226	#A	1.0324E+00	1.0324E+00	1.0890E+00	1.0907E+00	1.180E+00
AC-228		5.3136E-01	5.3136E-01	1.8841E-01	1.9092E-01	
TH-227	#B	-2.0211E-01	-2.0211E-01	4.0815E-01	4.0832E-01	4.492E-01
PA-234	#B	-2.9147E-02	-2.9147E-02	2.5050E-01	2.5050E-01	2.406E-01
TH-234	#B	2.3205E-01	2.3205E-01	5.2276E+00	5.2276E+00	5.946E+00
AM-241	#A	-4.3772E-01	-4.3773E-01	1.0634E+00	1.0637E+00	1.163E+00

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (86.9 to 2000.7 keV) 1.5557834E+01 pCi/gm
Total Decayed Activity (86.9 to 2000.7 keV) 1.5557850E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JJM

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 103F_14SEPT2006_1649.An1

Sample description
FSS-OOL-05-08-016-F

Spectrum Filename: C:\GammaVision\Spectra\103F_14SEPT2006_1649.An1

Acquisition information
Start time: 14-Sep-2006 16:49:56
Live time: 2000
Real time: 2002
Dead time: 0.10 %
Detector ID: 4

Detector system
Det 103 - DSPE-471

Calibration
Filename: D3_1LSa.Clb
Detector_103 1.0 Liter Sand Geometry

Energy Calibration
Created: 08-Aug-2005 11:09:41
Zero offset: 0.409 keV
Gain: 0.500 keV/channel
Quadratic: 1.092E-08 keV/channel^2

Efficiency Calibration
Created: 08-Aug-2005 11:11:25
Type: Polynomial
Uncertainty: 0.993 %
Coefficients: -0.264059 -5.138468 0.638383
-0.089199 0.005011 -0.000129

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.41keV)
Stop channel: 4000 (2000.67keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 1.8670E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.8670E+03) =
5.3562E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	11-Sep-2006 13:22:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	103_150K_05AUG05.Pbc 08-Aug-2005 12:54:15
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 16 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.1416

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
74.50	83.	33.38	0.99	8.988E-03	70.83	3.520	2.498E+00	HG203
					72.87	6.400	PBC<MDA	HG203
					74.81	9.600	PBC<MDA	PB212
77.32	191.	15.20	0.99	1.029E-02	77.11	17.500	7.682E-01	PB212
					77.11	10.700	1.256E+00	PB214
93.15	121.	32.05	1.50	1.631E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
93.17	119.	31.90	1.50	1.645E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
129.59	112.	37.95	1.08	2.443E-02				
186.25	160.	21.98	1.23	2.566E-02	185.99	3.280	1.268E+00	RA226
209.62	94.	32.25	0.73	2.470E-02				
238.74	1056.	3.62	1.09	2.319E-02	238.63	43.100	7.555E-01	PB212
241.96	145.	18.11	1.10	2.302E-02	241.00	3.900	1.165E+00	RA224
					241.92	7.470	6.094E-01	PB214
270.29	57.	37.75	0.88	2.151E-02				
295.30	212.	15.73	0.89	2.024E-02	295.22	19.200	3.862E-01	PB214
300.51	54.	41.11	0.73	1.999E-02				
328.78	100.	26.14	1.12	1.871E-02				
338.24	257.	12.67	1.12	1.831E-02	338.40	12.010	8.417E-01	AC228
351.88	382.	8.78	0.99	1.776E-02	351.99	37.100	4.136E-01	PB214
463.04	77.	29.12	1.19	1.426E-02				
463.04	77.	29.12	1.19	1.426E-02	463.51	10.000	3.845E-01	SB125
510.98	171.	15.77	1.29	1.317E-02	510.72	22.500	3.520E-01	TL208
583.33	372.	7.63	1.34	1.184E-02	583.14	86.000	2.611E-01	TL208
609.49	285.	7.91	1.28	1.144E-02	609.32	46.090	3.818E-01	BI214
719.68	37.	21.41	1.50	1.001E-02	722.95	90.499	PBC<MDA	Ag108M

					723.30	19.700	1.377E-01	EU154
727.08	88.	19.21	1.07	9.966E-03	727.17	11.800	5.374E-01	BI212
795.29	81.	25.62	1.37	9.305E-03				
795.29	81.	25.62	1.37	9.305E-03	795.76	85.400	7.403E-02	CS134
861.04	71.	17.64	1.52	8.764E-03				
911.41	245.	8.50	1.55	8.399E-03	911.07	29.000	7.182E-01	AC228
968.41	184.	13.31	1.64	8.029E-03	968.90	17.460	9.486E-01	AC228

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
1120.18	113.	18.75	1.66	7.212E-03	1120.28	15.040	7.414E-01	BI214
1461.22	1276.	2.84	1.87	5.931E-03	1460.75	10.700	1.434E+01	K40
1620.72	15.	33.70	0.62	5.488E-03	1620.56	2.750	7.077E-01	BI212
1764.84	44.	15.59	2.36	5.142E-03	1764.51	15.920	3.929E-01	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
258.36	129.59	674.	116.	0.058	98.79	1.085	AC-228	s
418.40	209.62	389.	94.	0.047	96.76	0.729	NP-239	s
539.74	270.29	203.	57.	0.029	113.25	0.885	AC-228	
600.16	300.51	209.	54.	0.027	123.34	0.729	PB-212	
656.71	328.78	222.	100.	0.050	78.42	1.118	LA-140	s
1721.12	861.04	38.	71.	0.035	52.92	1.521	TL-208	

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-212	148.79	74.81	331.	110.	0.055	73.27	0.993D
PB-212	153.39	77.11	329.	169.	0.084	45.18	0.995A
TH-234	185.48	93.15	931.	121.	0.060	96.14	1.500s
TH-234	185.52	93.17	904.	119.	0.060	95.69	1.500s
RA-226	371.57	186.21	680.	125.	0.062	83.62	1.500s
PB-212	476.71	238.78	703.	978.	0.489	16.00	1.050
RA-224	482.42	241.63	712.	138.	0.069	86.05	1.500
PB-214	589.74	295.30	336.	207.	0.104	47.18	0.888
AC-228	675.61	338.24	259.	256.	0.128	38.00	1.117
PB-214	702.89	351.88	254.	376.	0.188	26.35	0.990
SB-125	925.41	463.15	134.	77.	0.039	70.95	1.500
TL-208	1021.08	510.98	190.	144.	0.072	47.32	1.292s
TL-208	1165.77	583.33	132.	367.	0.184	22.88	1.337
BI-214	1218.08	609.49	99.	278.	0.139	23.72	1.281
EU-154	1438.43	719.68	13.	37.	0.019	64.22	1.500s
BI-212	1453.23	727.08	71.	87.	0.044	57.62	1.065s
CS-134	1589.78	795.36	63.	46.	0.023	86.22	1.500s
AC-228	1821.85	911.41	64.	242.	0.121	25.50	1.554
AC-228	1935.83	968.41	109.	184.	0.092	39.94	1.642s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
BI-214	2239.33	1120.18	86.	111.	0.056	56.26	1.662
K-40	2921.30	1461.22	30.	1258.	0.629	8.52	1.872
BI-212	3240.24	1620.72	4.	15.	0.007	101.11	0.624s
BI-214	3528.44	1764.84	6.	44.	0.022	46.77	2.358

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	Peak MDA Value pCi/gm	COMMENTS
BE-7		7.4569E-02					
			477.56	7.457E-02	%(	3.080E-01 9.13E-02	G
K-40		1.4343E+01					
			1460.75	1.434E+01	(P	3.230E-01 4.14E-01	G
MN-54		1.1578E-02					
			834.81	1.158E-02	%(P	3.507E-02 1.04E-02	G
CO-57		-6.7358E-03					
			122.07	-6.736E-03	%(P	5.037E-02 1.51E-02	G K
			136.43	4.641E-02	&	3.354E-01 1.00E-01	G
CO-60		1.1007E-02					
			1332.51	1.101E-02	%(P	3.604E-02 1.04E-02	G K
			1173.23	7.680E-03	& P	4.427E-02 1.28E-02	G K
Sr-85		-1.1438E-02					
			514.00	-1.144E-02	&(	3.993E-02 1.19E-02	G
Kr-85		-2.5525E+02					
			513.99	-2.552E+02	&(	8.914E+02 2.66E+02	G
Y-88		2.6147E-03					
			1836.01	2.615E-03	%(P	2.153E-02 5.65E-03	G K
			898.02	1.314E-02	% P	3.159E-02 9.46E-03	G
NB-94		-9.6177E-03					
			871.10	-9.618E-03	%(	3.792E-02 1.12E-02	G K
			702.50	-1.597E-04	&	3.154E-02 9.00E-03	G K
Ag-108M		-1.0939E-03					
			722.95	-1.094E-03	&(	2.243E-02 6.22E-03	G K
			614.37	-1.608E-02	& P	4.065E-02 1.22E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
		433.93	-4.482E-03	%	3.249E-02	9.54E-03	G
CD-109	1.2068E+00						
		88.04	1.207E+00	%(	1.839E+00	5.62E-01	G
SN-113	5.3348E-03						
		391.71	5.335E-03	&(	4.985E-02	1.47E-02	G K
		255.04	9.286E-03	%	1.362E+00	4.00E-01	G
SB-125	1.0474E-01						
		427.95	7.617E-03	%(P	9.028E-02	2.63E-02	G K
		600.77	1.892E-02	& P	1.781E-01	5.19E-02	G
		636.15	7.379E-02	& P	2.670E-01	7.89E-02	G
		463.51	3.922E-01	(P	2.881E-01	9.43E-02	G
		176.29	-6.060E-03	%	5.369E-01	1.59E-01	G
I-131	-3.3864E-03						
		364.48	-3.386E-03	%(P	4.695E-02	1.37E-02	G K
		636.97	-1.871E-01	%	6.371E-01	1.90E-01	G
		284.29	-9.579E-02	% P	6.814E-01	2.02E-01	G
CS-134	1.3708E-02						
		604.66	-1.071E-02	%(	3.768E-02	1.12E-02	G K
		795.76	4.162E-02	*(P	3.635E-02	1.20E-02	G
		569.29	-9.144E-03	& P	1.905E-01	5.42E-02	G
		801.84	-1.471E-02	% P	3.446E-01	9.58E-02	G
CS-137	5.0186E-03						
		661.62	5.019E-03	&(P	3.942E-02	1.14E-02	G
CE-139	-6.1568E-04						
		165.85	-6.157E-04	&(	4.265E-02	1.27E-02	G
EU-152	2.9279E-03						
		121.78	2.928E-03	%(P	1.408E-01	4.19E-02	G K
		344.30	-6.068E-03	& P	1.039E-01	3.04E-02	G
		1408.08	2.611E-02	&	1.371E-01	3.89E-02	G
		964.00	-1.009E-02	% P	4.478E-01	1.31E-01	G
		1112.07	-1.250E-03	%	3.059E-01	8.68E-02	G
		778.90	6.005E-02	%	2.437E-01	7.16E-02	G
EU-154	3.5056E-02						
		123.10	-1.492E-02	%(	1.020E-01	3.05E-02	G K
		1274.80	2.584E-02	&	1.111E-01	3.24E-02	G
		723.30	1.377E-01	&(	7.272E-02	2.95E-02	G
		1004.80	5.491E-02	%	1.347E-01	4.03E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
EU-155	1.0728E-01						
		86.45	1.073E-01	%(	2.232E-01	6.77E-02	G K
		105.31	1.020E-01	%	2.178E-01	6.60E-02	G
HG-203	4.5358E-04						
		279.17	4.536E-04	&(P	4.100E-02	1.21E-02	G K
		72.87	-3.135E-01	& P	2.175E+00	6.51E-01	G
		70.83	-1.031E+00	&	3.913E+00	1.18E+00	G
		82.50	2.886E-02	&	3.911E+00	1.16E+00	G
TL-208	2.6113E-01						
		583.14	2.611E-01	(P	3.990E-02	2.02E-02	G
		510.72	3.520E-01	+ P	1.634E-01	6.58E-02	G
PB-212	7.3195E-01						
		238.63	7.079E-01	(P	9.142E-02	3.82E-02	G K
							Energy duplication
		77.11	6.908E-01	} P	3.565E-01	1.04E-01	G
		74.81	9.200E-01	+ P	7.286E-01	2.31E-01	G
PB-214	4.0427E-01						
		351.99	4.136E-01	(P	8.454E-02	3.69E-02	G K
		295.22	3.862E-01	(P	1.640E-01	6.19E-02	G
							Energy duplication
		77.11	0.000E+00	} P	8.738E-01	0.00E+00	G
		241.92	2.453E-01	%	5.728E-01	1.73E-01	G
BI-212	5.6961E-01						
		727.17	5.374E-01	(P	2.579E-01	1.04E-01	G K
		1620.56	7.077E-01	(P	5.905E-01	2.39E-01	G
		785.42	6.765E-01	%	1.200E+00	3.70E-01	G
BI-214	3.8466E-01						
		609.32	3.818E-01	(P	6.733E-02	3.09E-02	G K
		1764.51	3.929E-01	(P	1.212E-01	6.58E-02	G
		1120.28	7.414E-01	+ P	3.063E-01	1.41E-01	G
RA-224	1.1086E+00						
		241.00	1.109E+00	(	1.022E+00	3.18E-01	G
RA-226	1.0718E+00						
		185.99	1.072E+00	*(P	1.068E+00	3.30E-01	G
AC-228	7.5435E-01						
		911.07	7.182E-01	(P	1.190E-01	6.19E-02	G K
		968.90	9.486E-01	+ P	2.657E-01	1.26E-01	G
		338.40	8.417E-01	(P	2.561E-01	1.07E-01	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments

TH-227      -8.9967E-02
                          236.00-8.997E-02 %(  3.446E-01 1.03E-01 G K
                          256.25-1.243E-01 % P 4.672E-01 1.40E-01 G

PA-234      -4.4158E-02
                           98.44-4.416E-02 &(P 1.981E-01 5.93E-02 G K
                          946.00 5.103E-02 % P 1.323E-01 3.95E-02 G
                          131.28-7.686E-03 & P 2.116E-01 6.31E-02 G
                           94.67-1.080E-01 % P 4.078E-01 1.23E-01 G
                          883.24-4.398E-03 &   2.889E-01 8.21E-02 G
                          926.70 2.769E-02 &   2.932E-01 8.38E-02 G
                          569.26-1.441E-02 & P 2.818E-01 8.03E-02 G

TH-234       1.6526E+00
                           63.29 1.293E+00 %(P 6.187E+00 1.85E+00 G K
                           92.80 1.750E+00  (P 2.094E+00 6.41E-01 G
                           92.38 2.085E+00  (P 2.503E+00 7.66E-01 G

AM-241      -1.3427E-01
                           59.54-1.343E-01 %(P 9.887E-01 2.95E-01 G
   ( - This peak used in the nuclide activity average.

   * - Peak is too wide, but only one peak in library.
   ! - Peak is part of a multiplet and this area went
       negative during deconvolution.
   ? - Peak is too narrow.
   @ - Peak is too wide at FW25M, but ok at FWHM.
   % - Peak fails sensitivity test.
   $ - Peak identified, but first peak of this nuclide
       failed one or more qualification tests.
   + - Peak activity higher than counting uncertainty range.
   - - Peak activity lower than counting uncertainty range.
   = - Peak outside analysis energy range.
   & - Calculated peak centroid is not close enough to the
       library energy centroid for positive identification.
   P - Peakbackground subtraction
   } - Peak is too close to another for the activity
       to be found directly.

   Nuclide Codes:                      Peak Codes:
   T - Thermal Neutron Activation      G - Gamma Ray
   F - Fast Neutron Activation         X - X-Ray
   I - Fission Product                 P - Positron Decay
   N - Naturally Occurring Isotope     S - Single-Escape
   P - Photon Reaction                 D - Double-Escape
   C - Charged Particle Reaction       K - Key Line
   M - No MDA Calculation              A - Not in Average
```

R - Coincidence Corrected C - Coincidence Peak
H - Halflife limit exceeded

- -

***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	7.1586E-02	7.4569E-02	2.7396E-01	2.7399E-01	2.957E-01
K-40		1.4343E+01	1.4343E+01	1.2403E+00	1.4939E+00	
MN-54	#A	1.1498E-02	1.1578E-02	3.1272E-02	3.1279E-02	3.483E-02
CO-57	#B	-6.6816E-03	-6.7358E-03	4.7341E-02	4.7342E-02	4.996E-02
CO-60	#B	1.0994E-02	1.1007E-02	3.1330E-02	3.1336E-02	3.599E-02
Sr-85	#A	-1.1060E-02	-1.1438E-02	3.5775E-02	3.5781E-02	3.861E-02
Kr-85	#A	-2.5524E+02	-2.5525E+02	7.9860E+02	7.9873E+02	8.914E+02
Y-88	#B	2.5618E-03	2.6147E-03	1.6954E-02	1.6954E-02	2.110E-02
NB-94	#B	-9.6177E-03	-9.6177E-03	3.3562E-02	3.3567E-02	3.792E-02
Ag-108M	#B	-1.0938E-03	-1.0939E-03	1.8663E-02	1.8663E-02	2.243E-02
CD-109	#A	1.2010E+00	1.2068E+00	1.6845E+00	1.6858E+00	1.830E+00
SN-113	#B	5.2348E-03	5.3348E-03	4.4034E-02	4.4035E-02	4.892E-02
SB-125	#F	1.0451E-01	1.0474E-01	7.5546E-02	7.5790E-02	9.009E-02
I-131	#B	-2.5823E-03	-3.3864E-03	5.4268E-02	5.4268E-02	3.580E-02
CS-134	#B	1.3668E-02	1.3708E-02	1.1842E-02	1.1869E-02	3.757E-02
CS-137	#A	5.0176E-03	5.0186E-03	3.4329E-02	3.4331E-02	3.941E-02
CE-139	#A	-6.0600E-04	-6.1568E-04	3.7989E-02	3.7989E-02	4.198E-02
EU-152	#B	2.9265E-03	2.9279E-03	1.2569E-01	1.2569E-01	1.408E-01
EU-154	#B	3.5031E-02	3.5056E-02	2.2511E-02	2.2595E-02	1.019E-01
EU-155	#B	1.0716E-01	1.0728E-01	2.0314E-01	2.0323E-01	2.230E-01
HG-203	#B	4.3285E-04	4.5358E-04	3.6259E-02	3.6259E-02	3.912E-02
TL-208		2.6113E-01	2.6113E-01	6.0454E-02	6.2326E-02	
PB-212		7.3195E-01	7.3195E-01	1.1855E-01	1.2594E-01	
PB-214		4.0427E-01	4.0427E-01	1.0813E-01	1.1065E-01	
BI-212		5.6961E-01	5.6961E-01	3.3006E-01	3.3171E-01	
BI-214		3.8466E-01	3.8466E-01	9.3364E-02	9.5997E-02	
RA-224		1.1086E+00	1.1086E+00	9.5390E-01	9.5607E-01	1.022E+00
RA-226	#	1.0718E+00	1.0718E+00	9.8938E-01	9.9134E-01	1.068E+00
AC-228		7.5435E-01	7.5435E-01	1.7386E-01	1.7930E-01	
TH-227	#B	-8.9967E-02	-8.9967E-02	3.1049E-01	3.1054E-01	3.446E-01
PA-234	#B	-4.4158E-02	-4.4158E-02	1.9110E-01	1.9112E-01	1.981E-01
TH-234	#B	1.6526E+00	1.6526E+00	1.8152E+00	1.8176E+00	6.187E+00
AM-241	#A	-1.3427E-01	-1.3427E-01	9.0764E-01	9.0767E-01	9.887E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.

H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (87.4 to 2000.7 keV) 1.8557629E+01 pCi/gm
Total Decayed Activity (87.4 to 2000.7 keV) 1.8557629E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JPK

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 107F_13SEPT2006_1422.An1

Sample description
FSS-OOL-05-08-017-F

Spectrum Filename: C:\GammaVision\Spectra\107F_13SEPT2006_1422.An1

Acquisition information

Start time:	13-Sep-2006 14:23:14
Live time:	2000
Real time:	2002
Dead time:	0.10 %
Detector ID:	2

Detector system
Det 107- DSPE- 634

Calibration

Filename:	D7_1LSa.Clb

Detector 107 Calibration for 1 Liter Sand Marinelli

Energy Calibration

Created:	29-Oct-2004 06:48:53
Zero offset:	0.157 keV
Gain:	0.500 keV/channel
Quadratic:	-1.676E-08 keV/channel^2

Efficiency Calibration

Created:	29-Oct-2004 06:51:32
Type:	Polynomial
Uncertainty:	1.174 %
Coefficients:	-0.279532 -4.778179 0.614896
	-0.087174 0.005356 -0.000131

Library Files

Main analysis library:	FSS_Rev_1.Lib
Library Match Width:	1.000
Peak stripping:	Library based

Analysis parameters

Analysis engine:	Env32 G53W4.20
Start channel:	100 (50.16keV)
Stop channel:	4000 (2000.15keV)
Peak rejection level:	41.667%
Peak search sensitivity:	3
Sample Size:	1.7950E+03
Activity scaling factor:	1.0000E+06/(1.0000E+00* 1.7950E+03) = 5.5710E+02
Detection limit method:	Nureg 4.16
Random error:	1.0000000E+00
Systematic error:	1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	12-Sep-2006 14:25:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	107_150K_28APR05.Pbc 01-May-2005 05:30:33
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 13 cutoff 20.00000 %
Energy Calibration
Normalized diff: 1.0000

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
76.02	813.	9.21	3.22	2.908E-02	72.87	6.400	3.528E+00	HG203
					74.81	9.600	2.228E+00	PB212
					77.11	10.700	1.924E+00	PB214
					77.11	17.500	1.183E+00	PB212
92.56	165.	30.20	1.28	3.433E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
129.37	109.	32.78	1.19	3.819E-02				
185.80	200.	23.00	2.31	3.612E-02	185.99	3.280	1.273E+00	RA226
239.05	1345.	4.96	2.63	3.186E-02	236.00	11.200	2.816E+00	TH227
					238.63	43.100	7.282E-01	PB212
295.48	226.	13.61	2.51	2.766E-02	295.22	19.200	3.145E-01	PB214
338.48	269.	12.89	2.85	2.500E-02	338.40	12.010	6.673E-01	AC228
352.18	485.	7.18	2.36	2.425E-02	351.99	37.100	4.016E-01	PB214
511.13	156.	15.53	1.56	1.807E-02	510.72	22.500	2.260E-01	TL208
583.51	406.	7.15	3.05	1.628E-02	583.14	86.000	2.157E-01	TL208
609.45	358.	8.90	2.54	1.574E-02	609.32	46.090	3.674E-01	BI214
727.26	61.	27.79	1.64	1.374E-02	727.17	11.800	2.850E-01	BI212
911.21	260.	9.76	2.50	1.161E-02	911.07	29.000	5.720E-01	AC228
967.91	211.	10.93	2.91	1.109E-02	968.90	17.460	8.200E-01	AC228
1120.66	108.	19.88	0.95	9.970E-03	1120.28	15.040	5.438E-01	BI214
1337.65	22.	36.43	0.53	8.748E-03				
1460.89	1406.	2.72	2.80	8.190E-03	1460.75	10.700	1.204E+01	K40
1764.53	76.	12.65	1.75	7.084E-03	1764.51	15.920	5.094E-01	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
151.71	76.02	1857.	410.	0.205	47.03	3.223	BI-207	s
477.73	239.05	1586.	577.	0.288	31.84	2.630	PB-212	s
703.97	352.18	555.	151.	0.075	70.76	2.364	PB-214	s
2674.89	1337.65	14.	22.	0.011	109.29	0.531	-	s

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-212	151.98	76.15	1661.	191.	0.095	91.35	1.500s
PB-214	153.89	77.11	1541.	204.	0.102	82.14	1.500D
PB-212	153.89	77.11	1536.	209.	0.105	82.14	1.500D
RA-226	371.25	185.80	686.	200.	0.100	69.00	2.306s
TH-227	476.95	238.66	942.	654.	0.327	23.08	1.500s
PB-212	477.05	238.71	988.	744.	0.372	20.54	1.500s
PB-214	590.73	295.55	385.	159.	0.080	55.71	1.500s
AC-228	676.58	338.48	296.	266.	0.133	38.67	2.848s
PB-214	703.62	352.00	266.	330.	0.165	26.22	1.500s
TL-208	1021.85	511.13	168.	122.	0.061	46.58	1.559s
TL-208	1166.60	583.51	130.	401.	0.201	21.46	3.048s
BI-214	1218.48	609.45	178.	354.	0.177	26.71	2.535s
BI-212	1454.09	727.26	122.	61.	0.031	83.37	1.638s
AC-228	1821.99	911.21	100.	256.	0.128	29.28	2.498s
AC-228	1935.39	967.91	89.	211.	0.105	32.79	2.907s
BI-214	2240.89	1120.66	94.	108.	0.054	59.63	0.953s
K-40	2921.37	1460.89	20.	1401.	0.701	8.17	2.803s
BI-214	3528.71	1764.53	5.	76.	0.038	37.96	1.753s

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	MDA Value pCi/gm	COMMENTS
BE-7		-4.3235E-02					
			477.56	-4.324E-02	%(	2.155E-01 6.35E-02	G
K-40		1.2037E+01					
			1460.75	1.204E+01	*(P	2.011E-01 3.29E-01	G
MN-54		1.0989E-02					
			834.81	1.099E-02	%(P	2.425E-02 7.32E-03	G
CO-57		-1.4038E-03					
			122.07	-1.404E-03	%(P	3.019E-02 8.99E-03	G K
			136.43	-3.318E-02	& P	2.703E-01 8.09E-02	G
CO-60		-1.5373E-03					
			1332.51	-1.537E-03	%(P	2.092E-02 5.27E-03	G K
			1173.23	4.844E-03	% P	3.708E-02 1.07E-02	G K
Sr-85		-7.4938E-03					
			514.00	-7.494E-03	%(	3.002E-02 8.94E-03	G
Kr-85		-2.0027E+02					
			513.99	-2.003E+02	%(P	6.903E+02 2.04E+02	G
Y-88		-9.0369E-04					
			1836.01	-9.037E-04	%(P	8.189E-03 1.11E-03	G K
			898.02	5.734E-03	% P	2.989E-02 8.69E-03	G
NB-94		-3.8280E-04					
			871.10	-3.828E-04	%(P	1.977E-02 5.49E-03	G K
			702.50	3.073E-03	% P	2.543E-02 7.38E-03	G K
Ag-108M		-1.4249E-02					
			722.95	-1.425E-02	%(	3.714E-02 1.12E-02	G K
			614.37	-2.312E-02	&	3.952E-02 1.21E-02	G
			433.93	3.839E-03	& P	2.199E-02 6.44E-03	G
CD-109		-1.9135E-03					
			88.04	-1.913E-03	&(P	1.079E+00 3.23E-01	G
SN-113		1.2863E-03					
			391.71	1.286E-03	%(P	3.615E-02 1.05E-02	G K
			255.04	1.243E-01	&	1.153E+00 3.42E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	9.0762E-03						
		427.95	9.076E-03	%(P	7.781E-02	2.28E-02	G K
		600.77	-6.354E-03	% P	1.457E-01	4.20E-02	G
		636.15	-4.933E-03	& P	1.927E-01	5.47E-02	G
		463.51	1.477E-01	% P	2.306E-01	7.06E-02	G
		176.29	7.056E-02	% P	3.933E-01	1.18E-01	G
I-131	4.9996E-03						
		364.48	5.000E-03	&(	2.915E-02	8.62E-03	G K
		636.97	-5.128E-02	&	3.405E-01	9.92E-02	G
		284.29	-2.099E-02	%	4.302E-01	1.27E-01	G
CS-134	-1.3310E-03						
		604.66	-1.331E-03	%(P	5.410E-02	1.60E-02	G K
		795.76	1.195E-02	% P	3.645E-02	1.09E-02	G
		569.29	-3.093E-02	%	1.568E-01	4.62E-02	G
		801.84	1.611E-01	% P	2.978E-01	9.09E-02	G
CS-137	1.0744E-02						
		661.62	1.074E-02	&(P	2.762E-02	8.21E-03	G
CE-139	8.1265E-03						
		165.85	8.127E-03	%(P	3.145E-02	9.45E-03	G
EU-152	-8.2326E-03						
		121.78	-8.233E-03	%(P	8.901E-02	2.66E-02	G K
		344.30	-3.458E-02	% P	8.401E-02	2.53E-02	G
		1408.08	1.367E-02	% P	1.093E-01	3.05E-02	G
		964.00	-3.870E-02	& P	2.942E-01	8.65E-02	G
		1112.07	8.095E-02	& P	2.020E-01	6.04E-02	G
		778.90	-6.228E-02	% P	2.215E-01	6.55E-02	G
EU-154	4.0966E-03						
		123.10	4.097E-03	%(P	6.949E-02	2.07E-02	G K
		1274.80	2.386E-04	& P	9.172E-02	2.59E-02	G
		723.30	-6.282E-02	& P	1.801E-01	5.39E-02	G
		1004.80	-1.614E-02	& P	1.419E-01	4.05E-02	G
EU-155	5.6352E-02						
		86.45	5.635E-02	%(	1.227E-01	3.72E-02	G K
		105.31	3.616E-02	% P	1.346E-01	4.05E-02	G
HG-203	1.3515E-02						
		279.17	1.351E-02	&(P	2.768E-02	8.39E-03	G K
		72.87	-2.197E-03	% P	8.571E-01	2.56E-01	G
		70.83	-6.359E-01	&	1.533E+00	4.64E-01	G
		82.50	-2.995E-01	%	1.601E+00	4.80E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	2.1787E-01						
		583.14	2.157E-01	*(P	2.996E-02	1.56E-02	G
		510.72	2.260E-01	*(P	1.167E-01	4.48E-02	G
PB-212	4.0739E-01						
		238.63	4.074E-01	*(P	8.172E-02	2.85E-02	G K
							Energy duplication
		77.11	3.043E-01	-	2.696E-01	8.33E-02	G
		74.81	5.247E-01	+ P	5.301E-01	1.63E-01	G
PB-214	2.7563E-01						
		351.99	2.756E-01	*(P	6.579E-02	2.45E-02	G K
		295.22	2.255E-01	- P	1.333E-01	4.31E-02	G
							Energy duplication
		77.11	4.864E-01	+ P	4.416E-01	1.36E-01	G
		241.92	-3.847E-01	% P	5.986E-01	1.82E-01	G
BI-212	2.8503E-01						
		727.17	2.850E-01	*(P	2.512E-01	8.09E-02	G K
		1620.56	1.929E-02	% P	8.436E-01	2.26E-01	G
		785.42	-4.763E-02	% P	1.207E+00	3.40E-01	G
BI-214	3.6739E-01						
		609.32	3.674E-01	*(P	6.731E-02	3.31E-02	G K
		1764.51	5.094E-01	+ P	8.551E-02	6.52E-02	G
		1120.28	5.438E-01	+ P	2.401E-01	1.09E-01	G
RA-224	4.0096E-02						
		241.00	4.010E-02	&(P	1.010E+00	3.02E-01	G
RA-226	1.2728E+00						
		185.99	1.273E+00	*(	7.931E-01	2.93E-01	G
AC-228	5.9992E-01						
		911.07	5.720E-01	*(P	1.104E-01	5.68E-02	G K
		968.90	8.200E-01	+ P	1.815E-01	9.05E-02	G
		338.40	6.673E-01	*(P	2.077E-01	8.71E-02	G
TH-227	1.3699E+00						
		236.00	1.370E+00	?(P	3.050E-01	1.05E-01	G K
		256.25	9.803E-03	% P	3.053E-01	8.97E-02	G
PA-234	-3.3364E-02						
		98.44	-3.336E-02	&(	1.203E-01	3.62E-02	G K
		946.00	-1.564E-02	&	1.598E-01	4.63E-02	G
		131.28	-4.044E-02	&	1.449E-01	4.36E-02	G
		94.67	-5.441E-02	%	2.280E-01	6.86E-02	G
		883.24	0.000E+00	%	2.588E-01	7.42E-02	G
		926.70	3.644E-02	&	1.812E-01	5.22E-02	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26-4.597E-02 %   2.325E-01 6.84E-02 G

TH-234       1.4022E-01
                           63.29 1.402E-01 %(P 1.481E+00 4.42E-01 G K
                           92.80 8.060E-01 % P 1.225E+00 3.72E-01 G
                           92.38 8.745E-01 % P 1.462E+00 4.44E-01 G

AM-241      -6.5428E-02
                           59.54-6.543E-02 %(P 2.020E-01 6.09E-02 G
   ( - This peak used in the nuclide activity average.

   * - Peak is too wide, but only one peak in library.
   ! - Peak is part of a multiplet and this area went
       negative during deconvolution.
   ? - Peak is too narrow.
   @ - Peak is too wide at FW25M, but ok at FWHM.
   % - Peak fails sensitivity test.
   $ - Peak identified, but first peak of this nuclide
       failed one or more qualification tests.
   + - Peak activity higher than counting uncertainty range.
   - - Peak activity lower than counting uncertainty range.
   = - Peak outside analysis energy range.
   & - Calculated peak centroid is not close enough to the
       library energy centroid for positive identification.
   P - Peakbackground subtraction
   } - Peak is too close to another for the activity
       to be found directly.

   Nuclide Codes:                      Peak Codes:
   T - Thermal Neutron Activation      G - Gamma Ray
   F - Fast Neutron Activation         X - X-Ray
   I - Fission Product                 P - Positron Decay
   N - Naturally Occurring Isotope     S - Single-Escape
   P - Photon Reaction                 D - Double-Escape
   C - Charged Particle Reaction       K - Key Line
   M - No MDA Calculation              A - Not in Average
   R - Coincidence Corrected           C - Coincidence Peak
   H - Halflife limit exceeded

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
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***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	-4.2678E-02	-4.3235E-02	1.9063E-01	1.9065E-01	2.127E-01
K-40	#	1.2037E+01	1.2037E+01	9.8667E-01	1.2161E+00	
MN-54	#A	1.0964E-02	1.0989E-02	2.1956E-02	2.1965E-02	2.419E-02
CO-57	#B	-1.4002E-03	-1.4038E-03	2.9537E-02	2.9537E-02	3.011E-02
CO-60	#B	-1.5368E-03	-1.5373E-03	4.4514E-02	4.4514E-02	2.092E-02

Sr-85	#A	-7.4142E-03	-7.4938E-03	2.6820E-02	2.6823E-02	2.970E-02
Kr-85	#A	-2.0027E+02	-2.0027E+02	8.2099E+02	8.2108E+02	6.903E+02
Y-88	#B	-8.9784E-04	-9.0369E-04	5.4221E-03	5.4224E-03	8.136E-03
NB-94	#B	-3.8280E-04	-3.8280E-04	2.5920E-02	2.5920E-02	1.977E-02
Ag-108M	#B	-1.4249E-02	-1.4249E-02	3.3504E-02	3.3515E-02	3.714E-02
CD-109	#A	-1.9105E-03	-1.9135E-03	6.1912E-01	6.1912E-01	1.077E+00
SN-113	#B	1.2786E-03	1.2863E-03	3.1633E-02	3.1633E-02	3.593E-02
SB-125	#B	9.0700E-03	9.0762E-03	6.8416E-02	6.8418E-02	7.776E-02
I-131	#B	4.5871E-03	4.9996E-03	2.5858E-02	2.5860E-02	2.674E-02
CS-134	#B	-1.3298E-03	-1.3310E-03	7.0906E-02	7.0906E-02	5.405E-02
CS-137	#A	1.0743E-02	1.0744E-02	2.4627E-02	2.4635E-02	2.762E-02
CE-139	#A	8.0857E-03	8.1265E-03	2.8337E-02	2.8341E-02	3.129E-02
EU-152	#B	-8.2314E-03	-8.2326E-03	8.1503E-02	8.1504E-02	8.900E-02
EU-154	#B	4.0957E-03	4.0966E-03	6.2193E-02	6.2194E-02	6.948E-02
EU-155	#B	5.6331E-02	5.6352E-02	1.1159E-01	1.1163E-01	1.227E-01
HG-203	#B	1.3315E-02	1.3515E-02	2.5175E-02	2.5187E-02	2.728E-02
TL-208	#	2.1787E-01	2.1787E-01	4.7285E-02	4.9005E-02	
PB-212	#	4.0739E-01	4.0739E-01	8.5452E-02	8.8775E-02	8.172E-02
PB-214	#	2.7563E-01	2.7563E-01	7.3401E-02	7.5185E-02	6.579E-02
BI-212	#	2.8503E-01	2.8503E-01	2.4261E-01	2.4319E-01	2.512E-01
BI-214	#	3.6739E-01	3.6739E-01	9.9323E-02	1.0167E-01	
RA-224	#A	4.0096E-02	4.0096E-02	9.0555E-01	9.0555E-01	1.010E+00
RA-226	#	1.2728E+00	1.2728E+00	8.7829E-01	8.8150E-01	
AC-228	#	5.9992E-01	5.9992E-01	1.4749E-01	1.5168E-01	
TH-227	#	1.3699E+00	1.3699E+00	3.1637E-01	3.2655E-01	3.050E-01
PA-234	#B	-3.3364E-02	-3.3364E-02	1.0859E-01	1.0861E-01	1.203E-01
TH-234	#B	1.4022E-01	1.4022E-01	1.3246E+00	1.3246E+00	1.481E+00
AM-241	#A	-6.5427E-02	-6.5428E-02	1.8735E-01	1.8739E-01	2.020E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (50.2 to 2000.1 keV) 1.4494698E+01 pCi/gm
Total Decayed Activity (50.2 to 2000.1 keV) 1.4494699E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JPK

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 107F_13SEPT2006_1932.An1

Sample description
FSS-OOL-05-08-015-F

Spectrum Filename: C:\GammaVision\Spectra\107F_13SEPT2006_1932.An1

Acquisition information

Start time:	13-Sep-2006 19:32:59
Live time:	2000
Real time:	2002
Dead time:	0.12 %
Detector ID:	2

Detector system
Det 107- DSPE- 634

Calibration

Filename:	D7_1LSa.Clb

Detector 107 Calibration for 1 Liter Sand Marinelli

Energy Calibration

Created:	29-Oct-2004 06:48:53
Zero offset:	0.157 keV
Gain:	0.500 keV/channel
Quadratic:	-1.676E-08 keV/channel^2

Efficiency Calibration

Created:	29-Oct-2004 06:51:32
Type:	Polynomial
Uncertainty:	1.174 %
Coefficients:	-0.279532 -4.778179 0.614896
	-0.087174 0.005356 -0.000131

Library Files

Main analysis library:	FSS_Rev_1.Lib
Library Match Width:	1.000
Peak stripping:	Library based

Analysis parameters

Analysis engine:	Env32 G53W4.20
Start channel:	100 (50.16keV)
Stop channel:	4000 (2000.15keV)
Peak rejection level:	41.667%
Peak search sensitivity:	3
Sample Size:	1.7380E+03
Activity scaling factor:	1.0000E+06/(1.0000E+00* 1.7380E+03) = 5.7537E+02
Detection limit method:	Nureg 4.16
Random error:	1.0000000E+00
Systematic error:	1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	11-Sep-2006 13:11:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	107_150K_28APR05.Pbc 01-May-2005 05:30:33
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 13 cutoff 20.00000 %
Energy Calibration
Normalized diff: 1.0000

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
75.92	895.	8.28	3.71	2.903E-02	72.87	6.400	4.089E+00	HG203
					74.81	9.600	2.534E+00	PB212
					77.11	10.700	2.188E+00	PB214
					77.11	17.500	1.345E+00	PB212
186.26	203.	24.94	2.25	3.608E-02	185.99	3.280	1.331E+00	RA226
239.10	1639.	4.02	2.25	3.186E-02	238.63	43.100	9.183E-01	PB212
					241.00	3.900	1.029E+01	RA224
295.27	266.	12.81	2.68	2.767E-02	295.22	19.200	3.832E-01	PB214
338.74	287.	11.43	2.43	2.498E-02	338.40	12.010	7.358E-01	AC228
352.04	522.	8.18	2.30	2.426E-02	351.99	37.100	4.470E-01	PB214
463.37	63.	31.80	1.50	1.953E-02	463.51	10.000	PBC<MDA	SB125
511.04	215.	16.60	1.89	1.807E-02	510.72	22.500	3.460E-01	TL208
583.36	459.	6.26	2.67	1.629E-02	583.14	86.000	2.520E-01	TL208
609.35	458.	6.99	2.17	1.574E-02	609.32	46.090	4.867E-01	BI214
727.63	128.	17.87	0.70	1.374E-02	727.17	11.800	6.123E-01	BI212
884.88	30.	35.99	1.74	1.188E-02	883.24	12.000	PBC<MDA	PA234
911.53	331.	7.19	2.47	1.160E-02	911.07	29.000	7.541E-01	AC228
968.40	265.	11.40	2.50	1.110E-02	968.90	17.460	1.053E+00	AC228
1120.27	114.	16.65	2.16	9.970E-03	1120.28	15.040	5.865E-01	BI214
1461.23	1731.	2.49	2.77	8.189E-03	1460.75	10.700	1.532E+01	K40
1764.92	83.	12.37	2.23	7.084E-03	1764.51	15.920	5.730E-01	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide
151.50	75.92	2096.	384.	0.192	52.90	3.706	BI-207 s
477.84	239.10	1703.	685.	0.342	28.03	2.249	PB-212 s
703.69	352.04	736.	159.	0.080	76.10	2.298	PB-214 s

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-212	149.39	74.86	2104.	187.	0.094	104.15	1.500s
PB-214	153.89	77.11	1875.	316.	0.158	59.59	1.500D
PB-212	153.89	77.11	1870.	321.	0.160	59.59	1.500D
RA-226	371.74	186.05	777.	138.	0.069	89.71	1.500s
TH-227	471.38	235.87	1639.	-195.	-0.098	90.75	1.500s
PB-212	477.13	238.75	1136.	926.	0.463	17.98	1.500s
PB-214	589.91	295.14	429.	185.	0.093	50.94	1.500s
AC-228	677.10	338.74	286.	284.	0.142	34.28	2.431s
PB-214	703.56	351.97	327.	358.	0.179	26.20	1.500s
SB-125	926.34	463.37	188.	63.	0.031	95.39	1.500s
TL-208	1021.67	511.04	291.	181.	0.091	49.79	1.894s
TL-208	1166.31	583.36	119.	454.	0.227	18.79	2.665s
BI-214	1218.27	609.35	167.	454.	0.227	20.97	2.169s
Ag-108M	1224.60	612.51	288.	-61.	-0.030	124.67	1.561s
BI-212	1454.83	727.63	116.	128.	0.064	53.61	0.704s
PA-234	1769.33	884.88	44.	30.	0.015	107.98	1.743s
AC-228	1822.61	911.53	76.	326.	0.163	21.58	2.472s
AC-228	1936.36	968.40	143.	262.	0.131	34.21	2.505s
BI-214	2240.10	1120.27	78.	113.	0.057	49.96	2.164s
K-40	2922.05	1461.23	34.	1726.	0.863	7.46	2.773s
BI-214	3529.49	1764.92	7.	83.	0.042	37.12	2.231s

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	MDA Value pCi/gm	COMMENTS
BE-7		-5.1129E-02					
			477.56	-5.113E-02	&(	2.729E-01 8.08E-02	G
K-40		1.5316E+01					
			1460.75	1.532E+01	*(P	2.634E-01 3.82E-01	G
MN-54		6.6191E-03					
			834.81	6.619E-03	%(P	2.982E-02 8.76E-03	G
CO-57		5.9513E-03					
			122.07	5.951E-03	%(P	3.629E-02 1.09E-02	G K
			136.43	-9.678E-03	% P	2.736E-01 8.16E-02	G
CO-60		2.0989E-03					
			1332.51	2.099E-03	%(P	3.170E-02 8.83E-03	G K
			1173.23	4.736E-03	% P	3.687E-02 1.06E-02	G K
Sr-85		-1.3827E-02					
			514.00	-1.383E-02	&(	3.796E-02 1.14E-02	G
Kr-85		-3.4165E+02					
			513.99	-3.417E+02	&(P	8.593E+02 2.57E+02	G
Y-88		-1.1991E-03					
			1836.01	-1.199E-03	%(P	2.083E-02 5.19E-03	G K
			898.02	-5.178E-03	& P	3.202E-02 9.20E-03	G
NB-94		5.3832E-03					
			871.10	5.383E-03	&(P	2.358E-02 6.88E-03	G K
			702.50	-2.585E-03	& P	3.177E-02 9.24E-03	G K
Ag-108M		-6.8829E-03					
			722.95	-6.883E-03	%(	3.580E-02 1.06E-02	G K
			614.37	-3.338E-02	+	4.497E-02 1.39E-02	G
			433.93	-1.628E-03	& P	2.817E-02 8.19E-03	G
CD-109		5.1734E-01					
			88.04	5.173E-01	%(P	1.151E+00 3.49E-01	G
SN-113		1.2332E-02					
			391.71	1.233E-02	%(P	3.910E-02 1.17E-02	G K
			255.04	-1.051E-01	%	1.222E+00 3.62E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	6.6543E-02						
		427.95	4.390E-03	&(P	8.158E-02	2.38E-02	G K
		600.77	-3.043E-02	& P	1.473E-01	4.31E-02	G
		636.15	4.397E-02	& P	2.360E-01	6.92E-02	G
		463.51	2.505E-01	(P	2.654E-01	8.32E-02	G
		176.29	8.856E-02	% P	4.214E-01	1.26E-01	G
I-131	5.0436E-03						
		364.48	5.044E-03	&(	3.592E-02	1.06E-02	G K
		636.97	1.310E-01	%	3.874E-01	1.16E-01	G
		284.29	2.410E-02	%	4.853E-01	1.43E-01	G
CS-134	-9.5897E-03						
		604.66	-9.590E-03	%(P	3.286E-02	9.79E-03	G K
		795.76	2.140E-02	% P	3.597E-02	1.10E-02	G
		569.29	1.737E-02	%	1.511E-01	4.40E-02	G
		801.84	-3.834E-03	& P	3.482E-01	9.99E-02	G
CS-137	2.3508E-02						
		661.62	2.351E-02	%(P	3.828E-02	1.17E-02	G
CE-139	4.9413E-03						
		165.85	4.941E-03	&(P	3.318E-02	9.92E-03	G
EU-152	2.1757E-02						
		121.78	2.176E-02	%(P	1.073E-01	3.22E-02	G K
		344.30	-4.823E-02	% P	9.763E-02	2.96E-02	G
		1408.08	-3.087E-03	% P	1.293E-01	3.53E-02	G
		964.00	-8.167E-02	% P	3.316E-01	9.87E-02	G
		1112.07	4.604E-02	& P	2.053E-01	5.97E-02	G
		778.90	5.802E-03	& P	2.088E-01	5.97E-02	G
EU-154	1.4668E-02						
		123.10	1.467E-02	%(P	7.156E-02	2.15E-02	G K
		1274.80	-2.473E-02	% P	1.025E-01	3.00E-02	G
		723.30	-3.326E-02	% P	1.843E-01	5.44E-02	G
		1004.80	-1.000E-03	% P	1.837E-01	5.23E-02	G
EU-155	4.8394E-02						
		86.45	4.839E-02	%(	1.417E-01	4.28E-02	G K
		105.31	2.510E-03	% P	1.571E-01	4.69E-02	G
HG-203	1.0389E-02						
		279.17	1.039E-02	&(P	2.888E-02	8.68E-03	G K
		72.87	-7.119E-03	% P	1.013E+00	3.03E-01	G
		70.83	-9.735E-01	%	1.807E+00	5.49E-01	G
		82.50	8.746E-02	%	2.181E+00	6.53E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	2.5201E-01						
		583.14	2.520E-01	*(P	2.971E-02	1.59E-02	G
		510.72	3.460E-01	+ P	1.571E-01	6.81E-02	G
PB-212	5.1435E-01						
		238.63	5.236E-01	*(P	9.038E-02	3.19E-02	G K
							Energy duplication
		77.11	4.820E-01	*(	3.069E-01	9.57E-02	G
		74.81	5.316E-01	*(P	6.153E-01	1.88E-01	G
PB-214	2.9633E-01						
		351.99	3.095E-01	*(P	7.510E-02	2.74E-02	G K
		295.22	2.710E-01	*(P	1.451E-01	4.71E-02	G
							Energy duplication
		77.11	7.767E-01	+ P	5.025E-01	1.57E-01	G
		241.92	-2.259E-01	% P	6.181E-01	1.87E-01	G
BI-212	6.1235E-01						
		727.17	6.123E-01	*(P	2.539E-01	1.11E-01	G K
		1620.56	4.136E-01	% P	5.482E-01	1.82E-01	G
		785.42	5.537E-01	% P	1.327E+00	3.98E-01	G
BI-214	5.2403E-01						
		609.32	4.867E-01	*(P	6.741E-02	3.43E-02	G K
		1764.51	5.730E-01	(P	1.031E-01	7.17E-02	G
		1120.28	5.865E-01	*(P	2.273E-01	9.84E-02	G
RA-224	6.8016E-02						
		241.00	6.802E-02	&(P	1.108E+00	3.32E-01	G
RA-226	9.0329E-01						
		185.99	9.033E-01	*(	8.709E-01	2.70E-01	G
AC-228	7.4872E-01						
		911.07	7.541E-01	*(P	9.980E-02	5.50E-02	G K
		968.90	1.053E+00	+ P	2.343E-01	1.21E-01	G
		338.40	7.358E-01	*(P	2.110E-01	8.51E-02	G
TH-227	-4.2172E-01						
		236.00	-4.217E-01	?(P	4.137E-01	1.27E-01	G K
		256.25	5.140E-02	% P	3.671E-01	1.09E-01	G
PA-234	1.8949E-02						
		98.44	-5.048E-02	%(	1.294E-01	3.91E-02	G K
		946.00	2.640E-02	&	1.501E-01	4.38E-02	G
		131.28	5.825E-04	&	1.641E-01	4.90E-02	G
		94.67	-1.034E-01	%	2.632E-01	7.96E-02	G
		883.24	1.642E-01	&(	1.827E-01	5.91E-02	G
		926.70	1.621E-02	&	2.883E-01	8.30E-02	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26 2.601E-02 %   2.236E-01 6.51E-02 G

TH-234       4.4626E-01
                           63.29 4.463E-01 %(P 1.724E+00 5.18E-01 G K
                           92.80 6.083E-01 % P 1.410E+00 4.26E-01 G
                           92.38 8.438E-01 % P 1.664E+00 5.04E-01 G

AM-241       1.0738E-03
                           59.54 1.074E-03 %(P 2.251E-01 6.72E-02 G
   ( - This peak used in the nuclide activity average.

   * - Peak is too wide, but only one peak in library.
   ! - Peak is part of a multiplet and this area went
       negative during deconvolution.
   ? - Peak is too narrow.
   @ - Peak is too wide at FW25M, but ok at FWHM.
   % - Peak fails sensitivity test.
   $ - Peak identified, but first peak of this nuclide
       failed one or more qualification tests.
   + - Peak activity higher than counting uncertainty range.
   - - Peak activity lower than counting uncertainty range.
   = - Peak outside analysis energy range.
   & - Calculated peak centroid is not close enough to the
       library energy centroid for positive identification.
   P - Peakbackground subtraction
   } - Peak is too close to another for the activity
       to be found directly.

   Nuclide Codes:                      Peak Codes:
   T - Thermal Neutron Activation      G - Gamma Ray
   F - Fast Neutron Activation         X - X-Ray
   I - Fission Product                 P - Positron Decay
   N - Naturally Occurring Isotope     S - Single-Escape
   P - Photon Reaction                 D - Double-Escape
   C - Charged Particle Reaction       K - Key Line
   M - No MDA Calculation              A - Not in Average
   R - Coincidence Corrected           C - Coincidence Peak
   H - Halflife limit exceeded

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
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***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	-4.9647E-02	-5.1129E-02	2.4226E-01	2.4228E-01	2.650E-01
K-40	#	1.5316E+01	1.5316E+01	1.1454E+00	1.4595E+00	
MN-54	#A	6.5859E-03	6.6191E-03	2.6287E-02	2.6290E-02	2.967E-02
CO-57	#B	5.9168E-03	5.9513E-03	3.2638E-02	3.2640E-02	3.608E-02
CO-60	#B	2.0972E-03	2.0989E-03	2.6490E-02	2.6490E-02	3.168E-02

Sr-85	#A	-1.3497E-02	-1.3827E-02	3.4277E-02	3.4287E-02	3.705E-02
Kr-85	#A	-3.4165E+02	-3.4165E+02	9.2149E+02	9.2171E+02	8.593E+02
Y-88	#B	-1.1816E-03	-1.1991E-03	1.2912E-01	1.2912E-01	2.052E-02
NB-94	#B	5.3832E-03	5.3832E-03	2.0628E-02	2.0631E-02	2.358E-02
Ag-108M	#B	-6.8826E-03	-6.8829E-03	3.1674E-02	3.1676E-02	3.580E-02
CD-109	#A	5.1555E-01	5.1734E-01	1.0464E+00	1.0468E+00	1.147E+00
SN-113	#B	1.2165E-02	1.2332E-02	3.5050E-02	3.5058E-02	3.857E-02
SB-125	#B	6.6440E-02	6.6543E-02	6.6316E-02	6.6432E-02	8.145E-02
I-131	#B	4.1488E-03	5.0436E-03	3.1842E-02	3.1844E-02	2.955E-02
CS-134	#B	-9.5697E-03	-9.5897E-03	3.1028E-02	3.1033E-02	3.280E-02
CS-137	#A	2.3504E-02	2.3508E-02	3.5061E-02	3.5088E-02	3.827E-02
CE-139	#A	4.8852E-03	4.9413E-03	2.9753E-02	2.9755E-02	3.280E-02
EU-152	#B	2.1750E-02	2.1757E-02	9.6675E-02	9.6683E-02	1.073E-01
EU-154	#B	1.4661E-02	1.4668E-02	6.4410E-02	6.4415E-02	7.152E-02
EU-155	#B	4.8352E-02	4.8394E-02	1.2848E-01	1.2851E-01	1.416E-01
HG-203	#B	1.0045E-02	1.0389E-02	2.6045E-02	2.6052E-02	2.792E-02
TL-208	#	2.5201E-01	2.5201E-01	4.7815E-02	5.0078E-02	
PB-212	#	5.1435E-01	5.1435E-01	9.4031E-02	9.8816E-02	9.038E-02
PB-214	#	2.9633E-01	2.9633E-01	7.8732E-02	8.0653E-02	7.510E-02
BI-212	#	6.1235E-01	6.1235E-01	3.3162E-01	3.3358E-01	
BI-214	#	5.2403E-01	5.2403E-01	1.1094E-01	1.1518E-01	
RA-224	#A	6.8016E-02	6.8016E-02	9.9512E-01	9.9513E-01	1.108E+00
RA-226	#	9.0329E-01	9.0329E-01	8.1033E-01	8.1209E-01	8.709E-01
AC-228	#	7.4872E-01	7.4872E-01	1.5344E-01	1.5969E-01	
TH-227	#A	-4.2172E-01	-4.2172E-01	3.8326E-01	3.8407E-01	4.137E-01
PA-234	#B	1.8949E-02	1.8949E-02	2.0460E-02	2.0487E-02	1.294E-01
TH-234	#B	4.4626E-01	4.4626E-01	1.5536E+00	1.5538E+00	1.724E+00
AM-241	#A	1.0738E-03	1.0738E-03	2.0164E-01	2.0164E-01	2.251E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (50.2 to 2000.1 keV) 1.7453581E+01 pCi/gm
Total Decayed Activity (50.2 to 2000.1 keV) 1.7453581E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JJM

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 107F_14SEPT2006_1535.An1

Sample description
FSS-OOL-05-08-018-F

Spectrum Filename: C:\GammaVision\Spectra\107F_14SEPT2006_1535.An1

Acquisition information
Start time: 14-Sep-2006 15:35:41
Live time: 2000
Real time: 2012
Dead time: 0.58 %
Detector ID: 2

Detector system
Det 107- DSPE- 634

Calibration
Filename: D7_1LSa.Clb
Detector 107 Calibration for 1 Liter Sand Marinelli

Energy Calibration
Created: 29-Oct-2004 06:48:53
Zero offset: 0.157 keV
Gain: 0.500 keV/channel
Quadratic: -1.676E-08 keV/channel^2

Efficiency Calibration
Created: 29-Oct-2004 06:51:32
Type: Polynomial
Uncertainty: 1.174 %
Coefficients: -0.279532 -4.778179 0.614896
-0.087174 0.005356 -0.000131

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.16keV)
Stop channel: 4000 (2000.15keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 1.7740E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.7740E+03) =
5.6370E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	11-Sep-2006 13:21:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	107_150K_28APR05.Pbc 01-May-2005 05:30:33
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 17 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.1310

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
75.96	871.	8.66	3.76	2.905E-02	72.87	6.400	3.944E+00	HG203
					74.81	9.600	2.415E+00	PB212
					77.11	10.700	2.085E+00	PB214
					77.11	17.500	1.282E+00	PB212
93.16	141.	33.10	1.72	3.446E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
186.63	160.	31.76	1.72	3.605E-02	185.99	3.280	1.029E+00	RA226
239.21	1502.	4.45	2.01	3.185E-02	238.63	43.100	8.235E-01	PB212
					241.00	3.900	9.238E+00	RA224
242.13	135.	27.15	1.30	3.163E-02	241.92	7.470	4.342E-01	PB214
294.81	263.	15.07	2.38	2.770E-02	295.22	19.200	3.705E-01	PB214
300.82	70.	32.00	0.72	2.730E-02				
328.36	83.	38.47	1.50	2.558E-02				
338.56	266.	13.94	1.94	2.499E-02	338.40	12.010	6.676E-01	AC228
352.09	467.	7.55	2.35	2.425E-02	351.99	37.100	3.910E-01	PB214
463.26	136.	18.34	1.80	1.954E-02				
463.26	136.	18.34	1.80	1.954E-02	463.51	10.000	5.207E-01	SB125
510.95	188.	13.84	2.93	1.808E-02	510.72	22.500	3.519E-01	TL208
583.55	526.	6.48	2.56	1.628E-02	583.14	86.000	2.833E-01	TL208
609.42	375.	7.30	2.67	1.574E-02	609.32	46.090	3.890E-01	BI214
727.56	104.	17.20	1.97	1.374E-02	727.17	11.800	4.905E-01	BI212
794.97	39.	35.54	1.68	1.284E-02	795.76	85.400	PBC<MDA	CS134
911.15	391.	7.76	2.34	1.161E-02	911.07	29.000	8.748E-01	AC228
968.03	273.	10.91	1.63	1.110E-02	968.90	17.460	1.064E+00	AC228
1120.71	77.	20.21	1.90	9.970E-03	1120.28	15.040	3.926E-01	BI214
1460.85	1569.	2.69	2.74	8.191E-03	1460.75	10.700	1.360E+01	K40
1620.27	27.	26.24	1.05	7.569E-03	1620.56	2.750	9.990E-01	BI212

1764.64	40.	21.10	2.29	7.084E-03	1764.51	15.920	2.732E-01	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide
372.91	186.63	834.	160.	0.080	95.28	1.719	PA-234 l
601.26	300.82	207.	70.	0.035	95.99	0.717	PB-212 s
656.33	328.36	323.	83.	0.041	115.42	1.503	RH-106M s
926.11	463.26	241.	57.	0.028	123.07	1.798	SB-125 s
1218.42	609.42	369.	135.	0.067	65.68	2.675	BI-214 s

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-212	149.29	74.81	848.	280.	0.140	47.01	1.178D
PB-212	153.89	77.11	888.	353.	0.177	29.60	1.179A
TH-234	185.71	93.02	1503.	155.	0.077	103.37	1.500s
TH-234	185.73	93.03	1454.	147.	0.073	99.18	1.500s
TH-227	471.60	235.98	1470.	-169.	-0.085	99.03	1.500s
PB-212	476.89	238.63	533.	908.	0.454	14.37	1.297D
RA-224	477.46	238.91	800.	862.	0.431	17.21	1.500s
PB-214	483.47	241.92	616.	135.	0.067	81.45	1.299D
PB-214	589.23	294.81	441.	258.	0.129	45.21	2.379s
AC-228	676.73	338.56	351.	263.	0.132	41.81	1.936s
PB-214	703.79	352.09	273.	462.	0.231	22.65	2.350s
SB-125	925.70	463.05	164.	77.	0.038	75.71	1.500s
TL-208	1021.48	510.95	228.	188.	0.094	41.53	2.925s
TL-208	1166.69	583.55	167.	521.	0.261	19.43	2.565s
BI-214	1218.66	609.54	175.	261.	0.131	27.86	1.558s
BI-212	1454.70	727.56	85.	104.	0.052	51.61	1.971s
CS-134	1589.52	794.97	80.	39.	0.020	106.61	1.684s
AC-228	1821.87	911.15	114.	387.	0.193	23.28	2.336s
AC-228	1935.30	967.87	97.	264.	0.132	27.59	1.622s
BI-214	2240.99	1120.71	87.	77.	0.039	60.64	1.897s
K-40	2921.30	1460.85	50.	1565.	0.782	8.08	2.736s
BI-212	3240.16	1620.27	7.	27.	0.014	78.73	1.050s
BI-214	3528.93	1764.64	18.	40.	0.020	63.29	2.291s

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	MDA Value pCi/gm	COMMENTS
BE-7		8.4968E-02					
			477.56	8.497E-02	%(	2.382E-01 7.14E-02	G
K-40		1.3599E+01					
			1460.75	1.360E+01	*(P	3.109E-01 3.68E-01	G
MN-54		1.1556E-02					
			834.81	1.156E-02	%(P	3.024E-02 9.06E-03	G
CO-57		-8.0783E-04					
			122.07	-8.078E-04	%(P	3.700E-02 1.10E-02	G K
			136.43	-2.747E-02	& P	2.849E-01 8.52E-02	G
CO-60		-4.0299E-03					
			1332.51	-4.030E-03	&(P	2.976E-02 8.01E-03	G K
			1173.23	-1.171E-04	& P	4.663E-02 1.34E-02	G K
Sr-85		-1.3344E-02					
			514.00	-1.334E-02	%(	3.496E-02 1.05E-02	G
Kr-85		-3.2777E+02					
			513.99	-3.278E+02	%(P	7.850E+02 2.35E+02	G
Y-88		-7.6696E-04					
			1836.01	-7.670E-04	&(P	2.343E-02 6.01E-03	G K
			898.02	-5.648E-03	& P	3.349E-02 9.67E-03	G
NB-94		3.0009E-03					
			871.10	3.001E-03	%(P	2.643E-02 7.62E-03	G K
			702.50	-7.330E-04	% P	2.694E-02 7.73E-03	G K
Ag-108M		0.0000E+00					
			722.95	0.000E+00	&(	5.263E-02 1.55E-02	G K
			614.37	-1.742E-02	%	3.718E-02 1.13E-02	G
			433.93	4.152E-03	& P	2.534E-02 7.45E-03	G
CD-109		6.4950E-01					
			88.04	6.495E-01	%(P	1.055E+00 3.21E-01	G
SN-113		4.2361E-03					
			391.71	4.236E-03	%(P	3.926E-02 1.15E-02	G K
			255.04	1.546E-02	%	1.233E+00 3.64E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	6.6545E-02						
		427.95	-1.210E-02	%(P	8.460E-02	2.48E-02	G K
		600.77	3.706E-02	% P	1.442E-01	4.27E-02	G
		636.15	-1.771E-02	& P	2.427E-01	7.03E-02	G
		463.51	2.993E-01	*(P	2.438E-01	7.83E-02	G
		176.29	4.159E-02	% P	4.435E-01	1.32E-01	G
I-131	-2.6043E-03						
		364.48	-2.604E-03	&(	3.953E-02	1.16E-02	G K
		636.97	-4.738E-02	&	4.836E-01	1.41E-01	G
		284.29	-4.060E-03	%	4.642E-01	1.36E-01	G
CS-134	1.3177E-02						
		604.66	8.316E-04	&(P	5.998E-02	1.78E-02	G K
		795.76	2.729E-02	*(P	3.096E-02	9.83E-03	G
		569.29	1.779E-02	&	1.333E-01	3.87E-02	G
		801.84	-2.420E-02	% P	3.072E-01	8.83E-02	G
CS-137	7.3423E-03						
		661.62	7.342E-03	%(P	3.686E-02	1.08E-02	G
CE-139	-4.9736E-03						
		165.85	-4.974E-03	%(P	3.024E-02	9.03E-03	G
EU-152	1.5348E-05						
		121.78	1.535E-05	%(P	1.045E-01	3.11E-02	G K
		344.30	-2.427E-02	& P	1.022E-01	3.05E-02	G
		1408.08	3.114E-04	% P	1.197E-01	3.26E-02	G
		964.00	4.294E-02	& P	2.057E-01	6.02E-02	G
		1112.07	-1.039E-02	% P	2.344E-01	6.66E-02	G
		778.90	3.335E-02	% P	1.812E-01	5.26E-02	G
EU-154	3.0511E-03						
		123.10	3.051E-03	&(P	7.785E-02	2.32E-02	G K
		1274.80	-2.083E-03	% P	8.773E-02	2.47E-02	G
		723.30	-9.907E-02	& P	1.932E-01	5.87E-02	G
		1004.80	-2.852E-03	& P	1.771E-01	5.05E-02	G
EU-155	6.0329E-02						
		86.45	6.033E-02	%(	1.345E-01	4.08E-02	G K
		105.31	3.333E-02	% P	1.516E-01	4.56E-02	G
HG-203	-6.2479E-04						
		279.17	-6.248E-04	%(P	3.379E-02	9.96E-03	G K
		72.87	-7.086E-02	% P	9.442E-01	2.83E-01	G
		70.83	-8.547E-01	%	1.750E+00	5.31E-01	G
		82.50	-3.374E-01	%	1.757E+00	5.27E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	2.8332E-01						
		583.14	2.833E-01	*(P	3.421E-02	1.85E-02	G
		510.72	3.519E-01	+ P	1.368E-01	5.74E-02	G
PB-212	5.2045E-01						
		238.63	5.032E-01	(P	6.111E-02	2.45E-02	G K
							Energy duplication
		77.11	5.196E-01	}	2.083E-01	5.13E-02	G
		74.81	7.786E-01	+ P	3.855E-01	1.24E-01	G
PB-214	3.8992E-01						
		351.99	3.910E-01	*(P	6.746E-02	2.99E-02	G K
		295.22	3.705E-01	*(P	1.441E-01	5.68E-02	G
							Energy duplication
		77.11	6.426E-02	} P	4.346E-01	1.21E-01	G
		241.92	4.342E-01	(P	3.817E-01	1.19E-01	G
BI-212	4.9047E-01						
		727.17	4.905E-01	*(P	2.141E-01	8.54E-02	G K
		1620.56	9.990E-01	+ P	5.407E-01	2.67E-01	G
		785.42	8.088E-01	% P	1.359E+00	4.17E-01	G
BI-214	2.7386E-01						
		609.32	2.741E-01	*(P	6.763E-02	2.59E-02	G K
		1764.51	2.732E-01	*(P	1.528E-01	5.89E-02	G
		1120.28	3.926E-01	+ P	2.341E-01	8.03E-02	G
RA-224	5.3130E+00						
		241.00	5.313E+00	&(P	8.288E-01	3.06E-01	G
RA-226	6.4259E-01						
		185.99	6.426E-01	%(	8.857E-01	2.71E-01	G
AC-228	9.3588E-01						
		911.07	8.748E-01	*(P	1.189E-01	6.86E-02	G K
		968.90	1.037E+00	*(P	1.914E-01	9.62E-02	G
		338.40	6.676E-01	- P	2.283E-01	9.42E-02	G
TH-227	-3.5833E-01						
		236.00	-3.583E-01	?(P	3.842E-01	1.18E-01	G K
		256.25	5.174E-03	& P	3.052E-01	8.95E-02	G
PA-234	-3.0853E-02						
		98.44	-3.085E-02	&(	1.339E-01	4.03E-02	G K
		946.00	0.000E+00	&	1.515E-01	4.32E-02	G
		131.28	-5.262E-02	%	1.644E-01	4.96E-02	G
		94.67	-8.792E-02	%	2.494E-01	7.54E-02	G
		883.24	2.100E-02	&	2.597E-01	7.52E-02	G
		926.70	8.756E-02	&	1.887E-01	5.71E-02	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26 2.600E-02 &   1.973E-01 5.72E-02 G

TH-234       9.1598E-01
                           63.29 5.068E-01 %(P 1.636E+00 4.92E-01 G K
                           92.80 1.085E+00  (P 1.332E+00 4.07E-01 G
                           92.38 1.339E+00  (P 1.585E+00 4.85E-01 G

AM-241       1.5520E-02
                           59.54 1.552E-02 &(P 2.079E-01 6.22E-02 G
   ( - This peak used in the nuclide activity average.

   * - Peak is too wide, but only one peak in library.
   ! - Peak is part of a multiplet and this area went
       negative during deconvolution.
   ? - Peak is too narrow.
   @ - Peak is too wide at FW25M, but ok at FWHM.
   % - Peak fails sensitivity test.
   $ - Peak identified, but first peak of this nuclide
       failed one or more qualification tests.
   + - Peak activity higher than counting uncertainty range.
   - - Peak activity lower than counting uncertainty range.
   = - Peak outside analysis energy range.
   & - Calculated peak centroid is not close enough to the
       library energy centroid for positive identification.
   P - Peakbackground subtraction
   } - Peak is too close to another for the activity
       to be found directly.

   Nuclide Codes:                      Peak Codes:
   T - Thermal Neutron Activation      G - Gamma Ray
   F - Fast Neutron Activation         X - X-Ray
   I - Fission Product                 P - Positron Decay
   N - Naturally Occurring Isotope     S - Single-Escape
   P - Photon Reaction                 D - Double-Escape
   C - Charged Particle Reaction       K - Key Line
   M - No MDA Calculation              A - Not in Average
   R - Coincidence Corrected           C - Coincidence Peak
   H - Halflife limit exceeded

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
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***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	8.1624E-02	8.4968E-02	2.1423E-01	2.1429E-01	2.288E-01
K-40	#	1.3599E+01	1.3599E+01	1.1026E+00	1.3642E+00	
MN-54	#A	1.1477E-02	1.1556E-02	2.7187E-02	2.7196E-02	3.003E-02
CO-57	#B	-8.0144E-04	-8.0783E-04	3.8935E-02	3.8935E-02	3.670E-02
CO-60	#B	-4.0254E-03	-4.0299E-03	2.3116E-01	2.3116E-01	2.973E-02

Sr-85	#A	-1.2910E-02	-1.3344E-02	3.1594E-02	3.1604E-02	3.383E-02
Kr-85	#A	-3.2776E+02	-3.2777E+02	8.4499E+02	8.4522E+02	7.850E+02
Y-88	#B	-7.5168E-04	-7.6696E-04	1.9103E-01	1.9103E-01	2.296E-02
NB-94	#B	3.0009E-03	3.0009E-03	2.2860E-02	2.2860E-02	2.643E-02
Ag-108M	#B	0.0000E+00	0.0000E+00	4.6408E-02	4.6408E-02	5.262E-02
CD-109	#A	6.4644E-01	6.4950E-01	9.6366E-01	9.6433E-01	1.050E+00
SN-113	#B	4.1579E-03	4.2361E-03	3.4635E-02	3.4636E-02	3.853E-02
SB-125	#B	6.6404E-02	6.6545E-02	5.2233E-02	5.2381E-02	8.442E-02
I-131	#B	-1.9947E-03	-2.6043E-03	3.4881E-02	3.4881E-02	3.027E-02
CS-134	#B	1.3139E-02	1.3177E-02	1.4237E-02	1.4258E-02	5.981E-02
CS-137	#A	7.3408E-03	7.3423E-03	3.2498E-02	3.2501E-02	3.686E-02
CE-139	#A	-4.8967E-03	-4.9736E-03	2.8074E-02	2.8075E-02	2.977E-02
EU-152	#B	1.5341E-05	1.5348E-05	9.3436E-02	9.3436E-02	1.044E-01
EU-154	#B	3.0490E-03	3.0511E-03	6.9740E-02	6.9740E-02	7.779E-02
EU-155	#B	6.0258E-02	6.0329E-02	1.2230E-01	1.2234E-01	1.344E-01
HG-203	#B	-5.9669E-04	-6.2479E-04	1.7240E-01	1.7240E-01	3.227E-02
TL-208	#	2.8332E-01	2.8332E-01	5.5533E-02	5.7999E-02	
PB-212		5.2045E-01	5.2045E-01	7.6087E-02	8.2061E-02	
PB-214		3.8992E-01	3.8992E-01	8.9304E-02	9.2225E-02	
BI-212		4.9047E-01	4.9047E-01	2.5623E-01	2.5787E-01	
BI-214	#	2.7386E-01	2.7386E-01	7.7560E-02	7.9229E-02	6.763E-02
RA-224	#	5.3130E+00	5.3130E+00	9.1677E-01	9.6898E-01	8.288E-01
RA-226	#A	6.4258E-01	6.4259E-01	8.1370E-01	8.1458E-01	8.857E-01
AC-228	#	9.3588E-01	9.3588E-01	1.7054E-01	1.7927E-01	
TH-227	#A	-3.5833E-01	-3.5833E-01	3.5544E-01	3.5607E-01	3.842E-01
PA-234	#B	-3.0853E-02	-3.0853E-02	1.2079E-01	1.2080E-01	1.339E-01
TH-234	#B	9.1598E-01	9.1598E-01	9.9561E-01	9.9691E-01	1.636E+00
AM-241	#A	1.5520E-02	1.5520E-02	1.8654E-01	1.8655E-01	2.079E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (295.2 to 2000.1 keV) 1.6219416E+01 pCi/gm
Total Decayed Activity (295.2 to 2000.1 keV) 1.6219416E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JJM

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 107F_14SEPT2006_1612.An1

Sample description
FSS-OOL-05-08-006-F

Spectrum Filename: C:\GammaVision\Spectra\107F_14SEPT2006_1612.An1

Acquisition information

Start time:	14-Sep-2006 16:12:53
Live time:	2000
Real time:	2002
Dead time:	0.08 %
Detector ID:	2

Detector system
Det 107- DSPE- 634

Calibration

Filename:	D7_1LSa.Clb

Detector 107 Calibration for 1 Liter Sand Marinelli

Energy Calibration

Created:	29-Oct-2004 06:48:53
Zero offset:	0.157 keV
Gain:	0.500 keV/channel
Quadratic:	-1.676E-08 keV/channel^2

Efficiency Calibration

Created:	29-Oct-2004 06:51:32
Type:	Polynomial
Uncertainty:	1.174 %
Coefficients:	-0.279532 -4.778179 0.614896
	-0.087174 0.005356 -0.000131

Library Files

Main analysis library:	FSS_Rev_1.Lib
Library Match Width:	1.000
Peak stripping:	Library based

Analysis parameters

Analysis engine:	Env32 G53W4.20
Start channel:	100 (50.16keV)
Stop channel:	4000 (2000.15keV)
Peak rejection level:	41.667%
Peak search sensitivity:	3
Sample Size:	1.1980E+03
Activity scaling factor:	1.0000E+06/(1.0000E+00* 1.1980E+03) = 8.3472E+02
Detection limit method:	Nureg 4.16
Random error:	1.0000000E+00
Systematic error:	1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	11-Sep-2006 12:50:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	107_150K_28APR05.Pbc 01-May-2005 05:30:33
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 14 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.2741

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
76.12	615.	10.13	1.86	2.913E-02	74.81	9.600	2.520E+00	PB212
					77.11	10.700	2.175E+00	PB214
					77.11	17.500	1.340E+00	PB212
186.03	121.	30.45	1.69	3.610E-02	185.99	3.280	1.156E+00	RA226
239.16	805.	6.40	1.91	3.185E-02	238.63	43.100	6.478E-01	PB212
					241.00	3.900	7.325E+00	RA224
295.14	166.	16.02	1.86	2.768E-02				
295.14	166.	16.02	1.86	2.768E-02	295.22	19.200	3.428E-01	PB214
338.56	178.	16.59	1.57	2.499E-02	338.40	12.010	6.565E-01	AC228
351.83	352.	8.75	2.05	2.427E-02				
351.83	352.	8.75	2.05	2.427E-02	351.99	37.100	4.345E-01	PB214
511.29	126.	15.88	1.64	1.806E-02	510.72	22.500	2.555E-01	TL208
583.24	238.	8.44	2.24	1.629E-02	583.14	86.000	1.880E-01	TL208
609.42	265.	9.52	2.25	1.574E-02	609.32	46.090	4.057E-01	BI214
661.97	299.	7.85	1.84	1.477E-02	661.62	84.620	2.667E-01	CS137
726.71	103.	21.98	2.09	1.375E-02	727.17	11.800	7.075E-01	BI212
794.50	24.	38.51	1.68	1.284E-02	795.76	85.400	PBC<MDA	CS134
911.30	169.	10.25	1.68	1.161E-02	911.07	29.000	5.535E-01	AC228
967.99	131.	13.43	2.08	1.110E-02	968.90	17.460	7.522E-01	AC228
1120.77	44.	25.19	1.90	9.970E-03	1120.28	15.040	3.279E-01	BI214
1237.71	47.	27.00	1.05	9.265E-03				
1460.94	829.	3.61	2.45	8.190E-03	1460.75	10.700	1.061E+01	K40
1621.16	16.	29.06	1.61	7.569E-03	1620.56	2.750	8.832E-01	BI212
1765.14	27.	29.40	2.29	7.084E-03	1764.51	15.920	2.682E-01	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
151.90	76.12	1390.	315.	0.158	52.91	1.857	BI-207	s
477.96	239.16	1032.	288.	0.144	50.56	1.908	PB-212	s
703.27	351.83	413.	114.	0.057	80.65	2.051	PB-214	s
1218.43	609.42	258.	103.	0.051	72.80	2.247	BI-214	s
2474.99	1237.71	38.	47.	0.023	80.99	1.052	J-133	s

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-214	153.89	77.11	1207.	231.	0.115	65.43	1.500D
PB-212	153.89	77.11	1202.	236.	0.118	65.43	1.500D
RA-226	371.05	185.71	444.	84.	0.042	111.72	1.500s
PB-212	477.21	238.79	615.	512.	0.256	23.61	1.500s
PB-214	590.44	295.41	263.	133.	0.066	55.82	1.500s
AC-228	676.74	338.56	207.	175.	0.087	49.76	1.566s
PB-214	703.29	351.84	160.	239.	0.120	28.93	1.500s
TL-208	1022.17	511.29	122.	92.	0.046	47.65	1.637s
TL-208	1166.06	583.24	62.	233.	0.117	25.31	2.240s
BI-214	1218.53	609.47	119.	170.	0.085	34.60	1.558s
CS-137	1323.52	661.97	67.	295.	0.148	23.55	1.841s
BI-212	1452.99	726.71	92.	102.	0.051	65.94	2.089s
CS-134	1588.56	794.50	31.	24.	0.012	115.54	1.684s
AC-228	1822.16	911.30	50.	165.	0.083	30.76	1.677s
AC-228	1935.55	967.99	51.	129.	0.065	40.28	2.078s
BI-214	2241.11	1120.77	41.	44.	0.022	75.57	1.897s
K-40	2921.47	1460.94	18.	824.	0.412	10.84	2.453s
BI-212	3241.95	1621.16	3.	16.	0.008	87.19	1.614
BI-214	3529.93	1765.14	20.	27.	0.013	88.19	2.291s

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	MDA Value pCi/gm	COMMENTS
BE-7		-4.1649E-02					
			477.56	-4.165E-02	%(	2.741E-01 7.99E-02	G
K-40		1.0610E+01					
			1460.75	1.061E+01	*(P	2.867E-01 3.86E-01	G
MN-54		9.2902E-03					
			834.81	9.290E-03	%(P	2.923E-02 8.61E-03	G
CO-57		2.5513E-03					
			122.07	2.551E-03	%(P	4.221E-02 1.26E-02	G K
			136.43	-6.990E-02	% P	2.904E-01 8.69E-02	G
CO-60		6.1826E-03					
			1332.51	6.183E-03	%(P	3.537E-02 9.76E-03	G K
			1173.23	1.125E-03	% P	4.211E-02 1.16E-02	G K
Sr-85		-1.7878E-02					
			514.00	-1.788E-02	%(	4.329E-02 1.31E-02	G
Kr-85		-4.4272E+02					
			513.99	-4.427E+02	%(P	9.738E+02 2.91E+02	G
Y-88		-3.3496E-03					
			1836.01	-3.350E-03	%(P	3.201E-02 8.25E-03	G K
			898.02	-3.499E-03	% P	3.246E-02 8.91E-03	G
NB-94		6.8827E-03					
			871.10	6.883E-03	%(P	2.568E-02 7.46E-03	G K
			702.50	7.882E-03	& P	2.829E-02 8.30E-03	G K
Ag-108M		-1.8991E-02					
			722.95	-1.899E-02	%(	4.635E-02 1.40E-02	G K
			614.37	-9.413E-03	%	4.484E-02 1.32E-02	G
			433.93	2.839E-03	% P	2.934E-02 8.47E-03	G
CD-109		3.7414E-01					
			88.04	3.741E-01	%(P	1.314E+00 3.96E-01	G
SN-113		-5.9760E-03					
			391.71	-5.976E-03	%(P	4.565E-02 1.32E-02	G K
			255.04	2.772E-02	&	9.966E-01 2.88E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	-2.1708E-02						
		427.95	-2.171E-02	%(P	9.944E-02	2.91E-02	G K
		600.77	6.591E-02	& P	1.105E-01	3.40E-02	G
		636.15	-5.258E-02	& P	2.657E-01	7.70E-02	G
		463.51	1.286E-01	% P	2.755E-01	8.29E-02	G
		176.29	2.618E-01	% P	4.931E-01	1.50E-01	G
I-131	1.4000E-02						
		364.48	1.400E-02	%(	4.373E-02	1.31E-02	G K
		636.97	-2.311E-02	&	4.866E-01	1.38E-01	G
		284.29	-1.859E-01	%	6.395E-01	1.91E-01	G
CS-134	8.3071E-03						
		604.66	-5.656E-03	%(P	3.200E-02	9.29E-03	G K
		795.76	2.427E-02	(P	2.973E-02	9.56E-03	G
		569.29	-4.532E-04	&	1.470E-01	4.10E-02	G
		801.84	-6.181E-02	% P	3.684E-01	1.06E-01	G
CS-137	2.6670E-01						
		661.62	2.667E-01	*(P	3.676E-02	2.12E-02	G
CE-139	5.2758E-03						
		165.85	5.276E-03	%(P	3.989E-02	1.19E-02	G
EU-152	-2.2174E-03						
		121.78	-2.217E-03	%(P	1.229E-01	3.65E-02	G K
		344.30	-1.963E-02	% P	1.101E-01	3.24E-02	G
		1408.08	4.222E-02	% P	1.258E-01	3.64E-02	G
		964.00	2.456E-02	& P	3.456E-01	1.00E-01	G
		1112.07	-4.249E-03	% P	3.302E-01	9.30E-02	G
		778.90	-3.812E-02	% P	2.165E-01	6.18E-02	G
EU-154	-1.6417E-02						
		123.10	-1.642E-02	%(P	9.057E-02	2.71E-02	G K
		1274.80	1.065E-02	% P	8.827E-02	2.46E-02	G
		723.30	-7.961E-02	% P	2.046E-01	6.13E-02	G
		1004.80	-8.933E-03	& P	1.747E-01	4.85E-02	G
EU-155	5.8216E-02						
		86.45	5.822E-02	%(	1.619E-01	4.89E-02	G K
		105.31	4.011E-02	% P	1.666E-01	5.00E-02	G
HG-203	1.2165E-02						
		279.17	1.216E-02	%(P	3.254E-02	9.76E-03	G K
		72.87	-2.672E-01	% P	1.120E+00	3.37E-01	G
		70.83	-4.407E-01	%	2.068E+00	6.22E-01	G
		82.50	-1.079E+00	%	2.382E+00	7.22E-01	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments

TL-208       1.8798E-01
                          583.14 1.880E-01 *(P 3.162E-02 1.62E-02 G
                          510.72 2.555E-01 + P 1.501E-01 5.54E-02 G

PB-212       4.4723E-01
                          238.63 4.203E-01 *(P 9.706E-02 3.41E-02 G K
                                                          Energy duplication
                           77.11 5.136E-01 *(  3.581E-01 1.12E-01 G
                           74.81 2.479E-01 % P 7.539E-01 2.28E-01 G

PB-214       2.9369E-01
                          351.99 2.997E-01 *(P 7.735E-02 2.95E-02 G K
                          295.22 2.821E-01 *(P 1.661E-01 5.43E-02 G
                                                          Energy duplication
                           77.11 8.230E-01 + P 5.868E-01 1.83E-01 G
                          241.92-1.901E-01 % P 6.513E-01 1.96E-01 G

BI-212       7.4072E-01
                          727.17 7.075E-01 *(P 3.302E-01 1.57E-01 G K
                         1620.56 8.832E-01  (P 5.620E-01 2.65E-01 G
                          785.42-1.068E-01 % P 1.189E+00 3.21E-01 G

BI-214       2.7737E-01
                          609.32 2.641E-01 *(P 8.323E-02 3.12E-02 G K
                         1764.51 2.682E-01 @(P 2.367E-01 8.15E-02 G
                         1120.28 3.279E-01  (P 2.460E-01 8.43E-02 G

RA-224      -1.1606E-01
                          241.00-1.161E-01 %(P 1.208E+00 3.60E-01 G

RA-226       7.9720E-01
                          185.99 7.972E-01 *(  9.609E-01 2.97E-01 G

AC-228       5.8364E-01
                          911.07 5.535E-01 *(P 1.193E-01 5.82E-02 G K
                          968.90 7.522E-01 + P 2.093E-01 1.03E-01 G
                          338.40 6.565E-01 *(P 2.622E-01 1.11E-01 G

TH-227      -2.3727E-01
                          236.00-2.373E-01 %(P 4.078E-01 1.24E-01 G K
                          256.25 1.008E-01 % P 4.075E-01 1.21E-01 G

PA-234      -1.7311E-03
                           98.44-1.731E-03 &(  1.625E-01 4.83E-02 G K
                          946.00 2.056E-02 %   1.594E-01 4.54E-02 G
                          131.28 1.762E-02 %   1.801E-01 5.37E-02 G
                           94.67-1.493E-01 %   3.125E-01 9.48E-02 G
                          883.24 8.089E-02 &   2.153E-01 6.41E-02 G
                          926.70 9.679E-02 %   2.580E-01 7.68E-02 G
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 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26 2.299E-03 %   2.675E-01 7.59E-02 G

TH-234       2.9815E-01
                           63.29 2.981E-01 %(P 2.085E+00 6.22E-01 G K
                           92.80 7.322E-01 % P 1.578E+00 4.76E-01 G
                           92.38 1.836E-01 % P 1.777E+00 5.30E-01 G

AM-241      -4.6188E-02
                           59.54-4.619E-02 %(P 2.945E-01 8.82E-02 G
   ( - This peak used in the nuclide activity average.

   * - Peak is too wide, but only one peak in library.
   ! - Peak is part of a multiplet and this area went
       negative during deconvolution.
   ? - Peak is too narrow.
   @ - Peak is too wide at FW25M, but ok at FWHM.
   % - Peak fails sensitivity test.
   $ - Peak identified, but first peak of this nuclide
       failed one or more qualification tests.
   + - Peak activity higher than counting uncertainty range.
   - - Peak activity lower than counting uncertainty range.
   = - Peak outside analysis energy range.
   & - Calculated peak centroid is not close enough to the
       library energy centroid for positive identification.
   P - Peakbackground subtraction
   } - Peak is too close to another for the activity
       to be found directly.

   Nuclide Codes:                      Peak Codes:
   T - Thermal Neutron Activation      G - Gamma Ray
   F - Fast Neutron Activation         X - X-Ray
   I - Fission Product                 P - Positron Decay
   N - Naturally Occurring Isotope     S - Single-Escape
   P - Photon Reaction                 D - Double-Escape
   C - Charged Particle Reaction       K - Key Line
   M - No MDA Calculation              A - Not in Average
   R - Coincidence Corrected           C - Coincidence Peak
   H - Halflife limit exceeded

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
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***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	-3.9985E-02	-4.1649E-02	2.3956E-01	2.3958E-01	2.632E-01
K-40	#	1.0610E+01	1.0610E+01	1.1567E+00	1.3155E+00	
MN-54	#A	9.2256E-03	9.2902E-03	2.5817E-02	2.5823E-02	2.903E-02
CO-57	#B	2.5308E-03	2.5513E-03	3.7668E-02	3.7668E-02	4.187E-02
CO-60	#B	6.1756E-03	6.1826E-03	2.9289E-02	2.9291E-02	3.533E-02

Sr-85	#A	-1.7288E-02	-1.7878E-02	3.9165E-02	3.9179E-02	4.186E-02
Kr-85	#A	-4.4271E+02	-4.4272E+02	1.0655E+03	1.0658E+03	9.738E+02
Y-88	#B	-3.2818E-03	-3.3496E-03	5.9112E-02	5.9113E-02	3.136E-02
NB-94	#B	6.8827E-03	6.8827E-03	2.2376E-02	2.2380E-02	2.568E-02
Ag-108M	#B	-1.8991E-02	-1.8991E-02	4.1860E-02	4.1875E-02	4.635E-02
CD-109	#A	3.7235E-01	3.7414E-01	1.1868E+00	1.1870E+00	1.308E+00
SN-113	#B	-5.8641E-03	-5.9760E-03	6.5315E-02	6.5316E-02	4.479E-02
SB-125	#B	-2.1662E-02	-2.1708E-02	1.1085E-01	1.1086E-01	9.923E-02
I-131	#B	1.0679E-02	1.4000E-02	3.9173E-02	3.9182E-02	3.336E-02
CS-134	#B	8.2831E-03	8.3071E-03	9.8137E-03	9.8259E-03	3.191E-02
CS-137	#	2.6665E-01	2.6670E-01	6.3563E-02	6.5486E-02	
CE-139	#A	5.1929E-03	5.2758E-03	3.5618E-02	3.5619E-02	3.926E-02
EU-152	#B	-2.2164E-03	-2.2174E-03	1.2432E-01	1.2432E-01	1.229E-01
EU-154	#B	-1.6405E-02	-1.6417E-02	8.5299E-02	8.5304E-02	9.051E-02
EU-155	#B	5.8146E-02	5.8216E-02	1.4667E-01	1.4670E-01	1.617E-01
HG-203	#B	1.1609E-02	1.2165E-02	2.9288E-02	2.9297E-02	3.106E-02
TL-208	#	1.8798E-01	1.8798E-01	4.8510E-02	4.9764E-02	
PB-212	#	4.4723E-01	4.4723E-01	1.0885E-01	1.1201E-01	9.706E-02
PB-214	#	2.9369E-01	2.9369E-01	8.6784E-02	8.8501E-02	7.735E-02
BI-212		7.4072E-01	7.4072E-01	4.1467E-01	4.1697E-01	
BI-214	#	2.7737E-01	2.7737E-01	9.8405E-02	9.9759E-02	8.323E-02
RA-224	#A	-1.1606E-01	-1.1606E-01	1.5384E+00	1.5384E+00	1.208E+00
RA-226	#A	7.9719E-01	7.9720E-01	8.9061E-01	8.9185E-01	9.609E-01
AC-228	#	5.8364E-01	5.8364E-01	1.7419E-01	1.7757E-01	
TH-227	#B	-2.3727E-01	-2.3727E-01	3.7521E-01	3.7547E-01	4.078E-01
PA-234	#B	-1.7311E-03	-1.7311E-03	1.4492E-01	1.4492E-01	1.625E-01
TH-234	#B	2.9815E-01	2.9815E-01	1.8654E+00	1.8654E+00	2.085E+00
AM-241	#A	-4.6187E-02	-4.6188E-02	2.7930E-01	2.7931E-01	2.945E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (50.2 to 2000.1 keV) 1.2388985E+01 pCi/gm
Total Decayed Activity (50.2 to 2000.1 keV) 1.2389038E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JPK

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 107F_14SEPT2006_1654.An1

Sample description
FSS-OOL-05-08-010-F

Spectrum Filename: C:\GammaVision\Spectra\107F_14SEPT2006_1654.An1

Acquisition information
Start time: 14-Sep-2006 16:54:35
Live time: 2000
Real time: 2009
Dead time: 0.45 %
Detector ID: 2

Detector system
Det 107- DSPE- 634

Calibration
Filename: D7_1LSa.Clb
Detector 107 Calibration for 1 Liter Sand Marinelli

Energy Calibration
Created: 29-Oct-2004 06:48:53
Zero offset: 0.157 keV
Gain: 0.500 keV/channel
Quadratic: -1.676E-08 keV/channel^2

Efficiency Calibration
Created: 29-Oct-2004 06:51:32
Type: Polynomial
Uncertainty: 1.174 %
Coefficients: -0.279532 -4.778179 0.614896
-0.087174 0.005356 -0.000131

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.16keV)
Stop channel: 4000 (2000.15keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 1.5380E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.5380E+03) =
6.5020E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	11-Sep-2006 13:08:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	107_150K_28APR05.Pbc 01-May-2005 05:30:33
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 17 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.2771

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
74.20	235.	16.55	1.18	2.817E-02	72.87	6.400	1.223E+00	HG203
					74.81	9.600	7.428E-01	PB212
77.01	408.	10.55	1.18	2.951E-02	77.11	17.500	6.935E-01	PB212
					77.11	10.700	1.121E+00	PB214
186.41	209.	23.23	1.24	3.610E-02	185.99	3.280	1.551E+00	RA226
209.02	127.	28.29	2.58	3.431E-02				
239.10	1488.	4.12	2.12	3.186E-02	238.63	43.100	9.413E-01	PB212
242.10	158.	22.16	1.30	3.163E-02	241.00	3.900	PBC<MDA	RA224
					241.92	7.470	5.866E-01	PB214
295.05	230.	13.53	1.81	2.769E-02	295.22	19.200	3.731E-01	PB214
338.78	193.	13.35	1.42	2.498E-02	338.40	12.010	5.553E-01	AC228
352.07	509.	7.23	2.37	2.425E-02	351.99	37.100	4.919E-01	PB214
462.88	93.	22.14	1.64	1.955E-02				
462.88	93.	22.14	1.64	1.955E-02	463.51	10.000	4.076E-01	SB125
510.33	152.	15.68	2.94	1.808E-02	510.72	22.500	3.290E-01	TL208
583.33	469.	7.24	2.22	1.629E-02	583.14	86.000	2.913E-01	TL208
609.11	396.	7.56	2.61	1.575E-02	609.32	46.090	4.743E-01	BI214
661.95	40.	41.38	1.59	1.477E-02	661.62	84.620	PBC<MDA	CS137
727.51	94.	17.82	1.93	1.374E-02	727.17	11.800	5.040E-01	BI212
795.66	40.	33.91	1.68	1.284E-02	795.76	85.400	PBC<MDA	CS134
911.37	269.	8.56	2.14	1.161E-02	911.07	29.000	6.916E-01	AC228
967.71	241.	11.90	1.91	1.110E-02	968.90	17.460	1.085E+00	AC228
1121.07	106.	21.57	2.31	9.970E-03	1120.28	15.040	6.218E-01	BI214
1460.93	1391.	2.81	2.65	8.190E-03	1460.75	10.700	1.390E+01	K40
1621.32	16.	38.46	0.95	7.569E-03	1620.56	2.750	6.626E-01	BI212
1764.87	88.	11.49	1.75	7.084E-03	1764.51	15.920	6.833E-01	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide
417.68	209.02	470.	127.	0.064	84.88	2.577	AC-228 s

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-212	149.29	74.81	718.	234.	0.117	51.53	1.178D
PB-212	153.89	77.11	725.	318.	0.159	1.47	1.179A
RA-226	372.46	186.41	716.	209.	0.105	69.69	1.237s
TH-227	471.31	235.84	1393.	-159.	-0.079	102.61	1.500s
PB-212	476.89	238.63	504.	844.	0.422	14.95	1.297D
PB-214	483.47	241.92	544.	158.	0.079	66.49	1.299D
PB-214	589.73	295.05	289.	226.	0.113	40.60	1.812s
AC-228	677.18	338.78	199.	190.	0.095	40.04	1.424s
PB-214	703.74	352.07	269.	504.	0.252	21.69	2.366s
SB-125	925.21	462.81	122.	62.	0.031	80.40	1.500s
TL-208	1020.26	510.33	224.	152.	0.076	47.05	2.936s
TL-208	1166.24	583.33	176.	464.	0.232	21.72	2.221s
BI-214	1217.80	609.11	139.	392.	0.196	22.67	2.613s
BI-212	1454.60	727.51	71.	93.	0.047	53.47	1.932
CS-134	1590.89	795.66	74.	40.	0.020	101.73	1.684s
AC-228	1822.30	911.37	77.	265.	0.132	25.69	2.141s
AC-228	1934.99	967.71	135.	239.	0.120	35.69	1.908s
BI-214	2241.71	1121.07	113.	106.	0.053	64.71	2.311s
K-40	2921.45	1460.93	34.	1386.	0.693	8.42	2.651s
BI-212	3242.26	1621.32	6.	16.	0.008	115.38	0.950s
BI-214	3529.39	1764.87	4.	88.	0.044	34.46	1.751s

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	MDA Value pCi/gm	COMMENTS
BE-7		2.4645E-02					
			477.56	2.465E-02	%(	2.608E-01 7.61E-02	G
K-40		1.3900E+01					
			1460.75	1.390E+01	*(P	2.977E-01 3.91E-01	G
MN-54		1.0423E-02					
			834.81	1.042E-02	%(P	3.112E-02 9.26E-03	G
CO-57		2.6639E-03					
			122.07	2.664E-03	%(P	3.362E-02 1.00E-02	G K
			136.43	-9.691E-02	% P	3.136E-01 9.45E-02	G
CO-60		-2.0323E-03					
			1332.51	-2.032E-03	%(P	3.264E-02 8.75E-03	G K
			1173.23	2.010E-02	% P	4.299E-02 1.29E-02	G K
Sr-85		-1.8443E-02					
			514.00	-1.844E-02	%(	4.155E-02 1.26E-02	G
Kr-85		-4.4559E+02					
			513.99	-4.456E+02	%(P	9.321E+02 2.81E+02	G
Y-88		1.7278E-04					
			1836.01	1.728E-04	%(P	2.223E-02 5.56E-03	G K
			898.02	9.077E-03	% P	2.909E-02 8.54E-03	G
NB-94		-2.7158E-05					
			871.10	-2.716E-05	%(P	2.665E-02 7.48E-03	G K
			702.50	2.560E-03	% P	2.691E-02 7.74E-03	G K
Ag-108M		-1.2970E-02					
			722.95	-1.297E-02	%(	3.822E-02 1.14E-02	G K
			614.37	-2.252E-02	%	4.091E-02 1.25E-02	G
			433.93	-7.583E-03	% P	3.001E-02 8.86E-03	G
CD-109		6.4134E-01					
			88.04	6.413E-01	%(P	1.186E+00 3.60E-01	G
SN-113		4.5773E-04					
			391.71	4.577E-04	&(P	3.561E-02 1.03E-02	G K
			255.04	2.357E-01	%	1.242E+00 3.70E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	7.3204E-02						
		427.95	3.041E-03	&(P	8.787E-02	2.55E-02	G K
		600.77	-2.471E-02	% P	1.405E-01	4.06E-02	G
		636.15	6.700E-02	& P	2.194E-01	6.49E-02	G
		463.51	2.809E-01	*(P	2.448E-01	7.87E-02	G
		176.29	-7.503E-02	& P	4.705E-01	1.40E-01	G
I-131	-6.6773E-04						
		364.48	-6.677E-04	&(	3.648E-02	1.06E-02	G K
		636.97	2.335E-02	&	5.562E-01	1.61E-01	G
		284.29	-5.736E-02	%	6.065E-01	1.80E-01	G
CS-134	9.8893E-03						
		604.66	-9.528E-03	%(P	3.423E-02	1.02E-02	G K
		795.76	3.208E-02	*(P	3.447E-02	1.10E-02	G
		569.29	6.683E-02	%	1.707E-01	5.13E-02	G
		801.84	-1.808E-03	& P	3.728E-01	1.06E-01	G
CS-137	2.7799E-02						
		661.62	2.780E-02	%(P	4.079E-02	1.25E-02	G
CE-139	-8.5830E-03						
		165.85	-8.583E-03	%(P	3.730E-02	1.12E-02	G
EU-152	7.7820E-03						
		121.78	7.782E-03	%(P	1.043E-01	3.11E-02	G K
		344.30	-1.512E-02	% P	1.027E-01	3.04E-02	G
		1408.08	1.264E-02	% P	1.434E-01	4.00E-02	G
		964.00	-1.030E-01	& P	4.206E-01	1.25E-01	G
		1112.07	1.102E-02	& P	2.755E-01	7.86E-02	G
		778.90	4.779E-02	% P	2.354E-01	6.89E-02	G
EU-154	5.0707E-04						
		123.10	5.071E-04	&(P	7.575E-02	2.25E-02	G K
		1274.80	-2.175E-02	& P	1.058E-01	3.07E-02	G
		723.30	-8.028E-02	% P	1.907E-01	5.74E-02	G
		1004.80	-5.165E-03	& P	1.492E-01	4.16E-02	G
EU-155	7.6297E-02						
		86.45	7.630E-02	%(	1.452E-01	4.41E-02	G K
		105.31	3.871E-02	& P	1.564E-01	4.70E-02	G
HG-203	-5.0821E-04						
		279.17	-5.082E-04	&(P	3.684E-02	1.08E-02	G K
		72.87	-4.784E-02	% P	1.009E+00	3.02E-01	G
		70.83	-3.172E-01	&	1.791E+00	5.38E-01	G
		82.50	-7.397E-01	%	1.897E+00	5.73E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	2.9913E-01						
		583.14	2.913E-01	*(P	4.042E-02	2.13E-02	G
		510.72	3.290E-01	*(P	1.564E-01	6.30E-02	G
PB-212	5.3943E-01						
		238.63	5.394E-01	(P	6.860E-02	2.74E-02	G K
							Energy duplication
		77.11	5.394E-01	}	2.176E-01	2.65E-03	G
		74.81	7.509E-01	+ P	4.098E-01	1.31E-01	G
PB-214	5.0781E-01						
		351.99	4.919E-01	*(P	7.728E-02	3.59E-02	G K
		295.22	3.731E-01	- P	1.355E-01	5.15E-02	G
							Energy duplication
		77.11	2.558E-01	} P	4.164E-01	1.32E-01	G
		241.92	5.866E-01	(P	4.143E-01	1.31E-01	G
BI-212	5.3395E-01						
		727.17	5.040E-01	(P	2.274E-01	9.11E-02	G K
		1620.56	6.626E-01	(P	6.082E-01	2.63E-01	G
		785.42	-2.492E-03	% P	1.681E+00	4.81E-01	G
BI-214	4.7432E-01						
		609.32	4.743E-01	*(P	6.989E-02	3.62E-02	G K
		1764.51	6.833E-01	+ P	9.637E-02	7.93E-02	G
		1120.28	6.218E-01	+ P	3.060E-01	1.35E-01	G
RA-224	1.8026E-01						
		241.00	1.803E-01	&(P	1.155E+00	3.46E-01	G
RA-226	1.5508E+00						
		185.99	1.551E+00	*(	9.453E-01	3.61E-01	G
AC-228	6.9159E-01						
		911.07	6.916E-01	*(P	1.138E-01	6.02E-02	G K
		968.90	1.085E+00	+ P	2.578E-01	1.30E-01	G
		338.40	5.553E-01	- P	2.004E-01	7.54E-02	G
TH-227	-3.8831E-01						
		236.00	-3.883E-01	?(P	4.316E-01	1.33E-01	G K
		256.25	-5.811E-02	& P	4.034E-01	1.19E-01	G
PA-234	-3.1041E-03						
		98.44	-3.104E-03	%(	1.496E-01	4.46E-02	G K
		946.00	-2.851E-04	%	1.686E-01	4.80E-02	G
		131.28	3.869E-02	%	1.653E-01	4.97E-02	G
		94.67	-7.959E-02	%	2.731E-01	8.23E-02	G
		883.24	2.203E-02	%	2.337E-01	6.69E-02	G
		926.70	5.656E-02	%	2.608E-01	7.61E-02	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26 9.889E-02 %   2.525E-01 7.58E-02 G

TH-234       3.9243E-01
                           63.29 3.924E-01 %(P 1.778E+00 5.33E-01 G K
                           92.80 4.314E-01 % P 1.445E+00 4.34E-01 G
                           92.38 6.182E-01 % P 1.713E+00 5.17E-01 G

AM-241      -4.9058E-02
                           59.54-4.906E-02 %(P 2.370E-01 7.12E-02 G
   ( - This peak used in the nuclide activity average.

   * - Peak is too wide, but only one peak in library.
   ! - Peak is part of a multiplet and this area went
       negative during deconvolution.
   ? - Peak is too narrow.
   @ - Peak is too wide at FW25M, but ok at FWHM.
   % - Peak fails sensitivity test.
   $ - Peak identified, but first peak of this nuclide
       failed one or more qualification tests.
   + - Peak activity higher than counting uncertainty range.
   - - Peak activity lower than counting uncertainty range.
   = - Peak outside analysis energy range.
   & - Calculated peak centroid is not close enough to the
       library energy centroid for positive identification.
   P - Peakbackground subtraction
   } - Peak is too close to another for the activity
       to be found directly.

   Nuclide Codes:                      Peak Codes:
   T - Thermal Neutron Activation      G - Gamma Ray
   F - Fast Neutron Activation         X - X-Ray
   I - Fission Product                 P - Positron Decay
   N - Naturally Occurring Isotope     S - Single-Escape
   P - Photon Reaction                 D - Double-Escape
   C - Charged Particle Reaction       K - Key Line
   M - No MDA Calculation              A - Not in Average
   R - Coincidence Corrected           C - Coincidence Peak
   H - Halflife limit exceeded

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
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***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	2.3655E-02	2.4645E-02	2.2821E-01	2.2821E-01	2.503E-01
K-40	#	1.3900E+01	1.3900E+01	1.1740E+00	1.4325E+00	
MN-54	#A	1.0350E-02	1.0423E-02	2.7767E-02	2.7774E-02	3.090E-02
CO-57	#B	2.6424E-03	2.6639E-03	3.0044E-02	3.0045E-02	3.335E-02
CO-60	#B	-2.0300E-03	-2.0323E-03	8.7588E-02	8.7588E-02	3.260E-02

Sr-85	#A	-1.7831E-02	-1.8443E-02	3.7710E-02	3.7726E-02	4.017E-02
Kr-85	#A	-4.4558E+02	-4.4559E+02	9.8066E+02	9.8101E+02	9.320E+02
Y-88	#B	1.6927E-04	1.7278E-04	1.6675E-02	1.6675E-02	2.177E-02
NB-94	#B	-2.7158E-05	-2.7158E-05	3.9261E-02	3.9261E-02	2.665E-02
Ag-108M	#B	-1.2969E-02	-1.2970E-02	3.4285E-02	3.4293E-02	3.822E-02
CD-109	#A	6.3825E-01	6.4134E-01	1.0812E+00	1.0818E+00	1.180E+00
SN-113	#B	4.4910E-04	4.5773E-04	3.0814E-02	3.0814E-02	3.494E-02
SB-125	#B	7.3046E-02	7.3204E-02	6.1516E-02	6.1668E-02	8.768E-02
I-131	#B	-5.0861E-04	-6.6773E-04	3.1788E-02	3.1788E-02	2.779E-02
CS-134	#B	9.8606E-03	9.8893E-03	1.0194E-02	1.0211E-02	3.413E-02
CS-137	#A	2.7794E-02	2.7799E-02	3.7594E-02	3.7630E-02	4.078E-02
CE-139	#A	-8.4475E-03	-8.5830E-03	3.4366E-02	3.4370E-02	3.672E-02
EU-152	#B	7.7783E-03	7.7820E-03	9.3324E-02	9.3325E-02	1.043E-01
EU-154	#B	5.0671E-04	5.0707E-04	6.7559E-02	6.7559E-02	7.569E-02
EU-155	#B	7.6205E-02	7.6297E-02	1.3232E-01	1.3239E-01	1.450E-01
HG-203	#B	-4.8489E-04	-5.0821E-04	8.4228E-02	8.4228E-02	3.515E-02
TL-208	#	2.9913E-01	2.9913E-01	6.5606E-02	6.7943E-02	
PB-212		5.3943E-01	5.3943E-01	8.2169E-02	8.8129E-02	
PB-214		5.0781E-01	5.0781E-01	1.1124E-01	1.1521E-01	
BI-212		5.3395E-01	5.3395E-01	2.8946E-01	2.9117E-01	
BI-214	#	4.7432E-01	4.7432E-01	1.0872E-01	1.1227E-01	
RA-224	#A	1.8026E-01	1.8026E-01	1.0393E+00	1.0394E+00	1.155E+00
RA-226	#	1.5508E+00	1.5508E+00	1.0807E+00	1.0846E+00	
AC-228	#	6.9159E-01	6.9159E-01	1.8049E-01	1.8505E-01	
TH-227	#A	-3.8831E-01	-3.8831E-01	3.9914E-01	3.9980E-01	4.316E-01
PA-234	#B	-3.1041E-03	-3.1041E-03	1.3391E-01	1.3391E-01	1.496E-01
TH-234	#B	3.9243E-01	3.9243E-01	1.5978E+00	1.5980E+00	1.778E+00
AM-241	#A	-4.9057E-02	-4.9058E-02	2.2207E-01	2.2208E-01	2.370E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (295.2 to 2000.1 keV) 1.8496693E+01 pCi/gm
Total Decayed Activity (295.2 to 2000.1 keV) 1.8496700E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JPK

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 101F_13SEPT2006_0938.An1

Sample description
FSS-OOL-05-09-014-F

Spectrum Filename: C:\GammaVision\Spectra\101F_13SEPT2006_0938.An1

Acquisition information
Start time: 13-Sep-2006 09:38:05
Live time: 2000
Real time: 2002
Dead time: 0.11 %
Detector ID: 1

Detector system
Det 101- DSPE-633

Calibration
Filename: D1_1LSa.Clb
Detector 101 1.0 Liter Marinelli Sand

Energy Calibration
Created: 03-Sep-2004 08:50:48
Zero offset: 0.244 keV
Gain: 0.500 keV/channel
Quadratic: -2.493E-08 keV/channel^2

Efficiency Calibration
Created: 03-Sep-2004 08:52:26
Type: Polynomial
Uncertainty: 0.626 %
Coefficients: -0.321775 -5.816463 0.734234
-0.099357 0.006049 -0.000149

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.23keV)
Stop channel: 4000 (1999.11keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 1.9500E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.9500E+03) =
5.1282E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	11-Sep-2006 14:52:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	101_150K_28APR05.Pbc 01-May-2005 05:24:47
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 15 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.1124

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
74.69	186.	17.01	1.00	1.651E-02				
74.69	186.	17.01	1.00	1.651E-02	74.81	9.600	7.892E-01	PB212
74.96	165.	26.87	1.50	1.654E-02				
74.96	165.	26.87	1.50	1.654E-02	74.81	9.600	7.188E-01	PB212
76.98	273.	16.28	1.50	1.720E-02	77.11	10.700	1.012E+00	PB214
					77.11	17.500	6.273E-01	PB212
77.08	308.	10.47	1.01	1.720E-02	77.11	10.700	1.160E+00	PB214
					77.11	17.500	7.094E-01	PB212
87.24	133.	30.63	1.50	1.910E-02	86.45	32.740	1.474E-01	EU155
					88.04	3.790	PBC<MDA	CD109
128.99	105.	31.34	1.05	2.110E-02				
186.17	120.	25.77	1.40	1.857E-02	185.99	3.280	1.359E+00	RA226
209.46	81.	35.27	0.95	1.721E-02				
232.94	47.	33.13	0.88	1.588E-02				
238.73	599.	4.95	1.12	1.557E-02				
238.73	599.	4.95	1.12	1.557E-02	238.63	43.100	6.116E-01	PB212
242.03	93.	20.77	1.12	1.540E-02	241.00	3.900	PBC<MDA	RA224
					241.92	7.470	5.560E-01	PB214
295.05	176.	13.19	1.37	1.293E-02	295.22	19.200	4.861E-01	PB214
338.59	123.	18.20	1.13	1.134E-02	338.40	12.010	6.142E-01	AC228
352.01	235.	10.54	1.42	1.092E-02	351.99	37.100	3.984E-01	PB214
511.01	89.	21.43	1.74	7.586E-03	510.72	22.500	2.953E-01	TL208
583.04	162.	11.14	1.27	6.686E-03	583.14	86.000	1.919E-01	TL208
609.28	164.	11.11	1.25	6.413E-03	609.32	46.090	3.829E-01	BI214
727.77	62.	20.06	1.58	5.439E-03	727.17	11.800	6.573E-01	BI212
911.03	136.	11.53	1.65	4.447E-03	911.07	29.000	7.225E-01	AC228
968.43	90.	19.44	0.92	4.214E-03	968.90	17.460	8.413E-01	AC228

1120.51	53.	27.00	0.92	3.711E-03	1120.28	15.040	6.534E-01	BI214
1460.51	561.	4.33	1.74	2.943E-03	1460.75	10.700	1.230E+01	K40
1763.93	37.	16.44	1.42	2.481E-03	1764.51	15.920	6.414E-01	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
148.95	74.72	408.	186.	0.093	51.04	1.005	BI-207	D
257.59	128.99	413.	120.	0.060	76.73	1.048	AC-228	s
418.59	209.46	294.	81.	0.041	105.80	0.945	AC-228	
477.16	238.63	139.	599.	0.299	14.85	1.122	PB-212	D
1455.70	727.77	60.	31.	0.015	119.45	1.581	J-132	s

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-212	149.49	74.96	963.	165.	0.082	80.61	1.499s
PB-214	153.79	77.11	381.	308.	0.154	31.40	1.006D
PB-212	153.79	77.11	848.	273.	0.136	48.85	1.499D
EU-155	174.06	87.24	762.	133.	0.066	91.89	1.499
RA-226	372.03	186.19	400.	108.	0.054	83.37	1.499s
PB-212	476.96	238.63	390.	529.	0.264	20.24	1.499D
PB-214	483.54	241.92	141.	92.	0.046	62.26	1.124D
PB-214	589.85	295.05	141.	174.	0.087	39.57	1.370s
AC-228	676.95	338.59	137.	121.	0.060	54.59	1.134
PB-214	703.81	352.01	137.	233.	0.117	31.61	1.421
TL-208	1021.96	511.01	104.	73.	0.036	64.30	1.739s
TL-208	1166.09	583.04	65.	159.	0.080	33.41	1.266
BI-214	1218.60	609.28	56.	163.	0.082	33.33	1.253
BI-212	1454.10	726.97	42.	30.	0.015	104.18	1.499s
AC-228	1822.41	911.03	38.	134.	0.067	34.59	1.650s
AC-228	1937.28	968.43	55.	89.	0.045	58.31	0.920s
BI-214	2241.61	1120.51	46.	53.	0.026	81.00	0.919s
K-40	2922.04	1460.51	10.	559.	0.279	12.98	1.740
BI-214	3529.29	1763.93	0.	37.	0.018	49.32	1.416s

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	MDA Value pCi/gm	COMMENTS
BE-7		1.6419E-01					
			477.56	1.642E-01	%(	3.444E-01 1.04E-01	G
K-40		1.2302E+01					
			1460.75	1.230E+01	(P	3.853E-01 5.34E-01	G
MN-54		1.4725E-02					
			834.81	1.472E-02	&(P	4.127E-02 1.22E-02	G
CO-57		-6.3203E-03					
			122.07	-6.320E-03	%(	4.595E-02 1.37E-02	G K
			136.43	1.257E-01	&	3.504E-01 1.06E-01	G
CO-60		1.9455E-03					
			1332.51	1.946E-03	%(P	4.889E-02 1.32E-02	G K
			1173.23	3.471E-02	% P	5.988E-02 1.85E-02	G K
Sr-85		-9.8613E-03					
			514.00	-9.861E-03	&(	5.133E-02 1.51E-02	G
Kr-85		-2.4882E+02					
			513.99	-2.488E+02	&(P	1.168E+03 3.42E+02	G
Y-88		0.0000E+00					
			1836.01	0.000E+00	%(	2.174E-02 2.95E-03	G K
			898.02	2.077E-02	% P	3.870E-02 1.19E-02	G
NB-94		2.6903E-04					
			871.10	2.690E-04	&(P	3.819E-02 1.04E-02	G K
			702.50	4.313E-03	& P	3.361E-02 9.47E-03	G K
Ag-108M		-1.2281E-02					
			722.95	-1.228E-02	%(	4.968E-02 1.45E-02	G K
			614.37	6.013E-03	& P	3.838E-02 1.10E-02	G
			433.93	4.082E-03	%	4.279E-02 1.24E-02	G
CD-109		5.6519E-03					
			88.04	5.652E-03	&(P	1.360E+00 4.05E-01	G
SN-113		-5.6205E-03					
			391.71	-5.620E-03	%(	6.176E-02 1.80E-02	G K
			255.04	-3.804E-01	% P	1.776E+00 5.28E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	1.9266E-02						
		427.95	1.927E-02	&(P	1.195E-01	3.48E-02	G K
		600.77	-1.318E-03	& P	2.274E-01	6.41E-02	G
		636.15	-9.696E-02	% P	3.819E-01	1.12E-01	G
		463.51	4.651E-02	% P	3.516E-01	1.01E-01	G
		176.29	-1.202E-01	% P	5.848E-01	1.74E-01	G
I-131	-2.5468E-04						
		364.48	-2.547E-04	&(	4.710E-02	1.35E-02	G K
		636.97	-1.461E-01	%	6.408E-01	1.87E-01	G
		284.29	2.449E-02	%	6.639E-01	1.94E-01	G
CS-134	-8.2781E-04						
		604.66	-8.278E-04	%(P	3.995E-02	1.12E-02	G K
		795.76	3.457E-02	% P	4.958E-02	1.56E-02	G
		569.29	7.206E-02	% P	2.436E-01	7.18E-02	G
		801.84	-8.384E-02	&	5.733E-01	1.65E-01	G
CS-137	1.6201E-02						
		661.62	1.620E-02	%(P	4.951E-02	1.46E-02	G
CE-139	9.2185E-04						
		165.85	9.218E-04	%(P	4.544E-02	1.34E-02	G
EU-152	1.8906E-02						
		121.78	1.891E-02	%(P	1.032E-01	3.07E-02	G K
		344.30	-2.670E-02	% P	1.258E-01	3.70E-02	G
		1408.08	6.256E-02	% P	1.659E-01	4.87E-02	G
		964.00	-5.185E-03	% P	8.601E-01	2.52E-01	G
		1112.07	2.375E-02	% P	3.699E-01	1.03E-01	G
		778.90	-1.730E-02	& P	2.968E-01	8.24E-02	G
EU-154	-2.2584E-02						
		123.10	-2.258E-02	%(P	9.123E-02	2.73E-02	G K
		1274.80	9.581E-03	% P	1.791E-01	5.01E-02	G
		723.30	-6.216E-02	% P	2.387E-01	6.97E-02	G
		1004.80	-1.575E-03	% P	2.640E-01	7.22E-02	G
EU-155	1.4743E-01						
		86.45	1.474E-01	(	1.457E-01	4.52E-02	G K
		105.31	2.267E-02	&	1.892E-01	5.65E-02	G
HG-203	1.7536E-02						
		279.17	1.754E-02	&(	4.000E-02	1.21E-02	G K
		72.87	-5.339E-01	% P	1.175E+00	3.55E-01	G
		70.83	4.576E-01	%	1.822E+00	5.47E-01	G
		82.50	-3.997E-01	%	2.378E+00	7.12E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	1.9195E-01						
		583.14	1.919E-01	(P	4.848E-02	2.17E-02	G
		510.72	2.953E-01	+ P	2.040E-01	7.73E-02	G
PB-212	5.6929E-01						
							Energy duplication
		238.63	5.458E-01	(P	9.777E-02	3.73E-02	G K
							Energy duplication
		77.11	6.273E-01	(	3.187E-01	1.02E-01	G
		74.81	7.188E-01	& P	6.429E-01	1.99E-01	G
PB-214	4.4334E-01						
		351.99	3.984E-01	(P	9.789E-02	4.23E-02	G K
		295.22	4.861E-01	@(P	1.621E-01	6.47E-02	G
							Energy duplication
		77.11	1.160E+00	+ P	3.525E-01	1.23E-01	G
		241.92	5.564E-01	(P	3.492E-01	1.16E-01	G
BI-212	3.2421E-01						
		727.17	3.242E-01	*(P	3.560E-01	1.15E-01	G K
		1620.56	0.000E+00	%	2.401E+00	6.51E-01	G
		785.42	1.353E+00	% P	2.086E+00	6.51E-01	G
BI-214	3.8287E-01						
		609.32	3.829E-01	(P	8.791E-02	4.28E-02	G K
		1764.51	6.414E-01	+ P	1.293E-01	1.07E-01	G
		1120.28	6.534E-01	+ P	4.277E-01	1.78E-01	G
RA-224	3.4997E-01						
		241.00	3.500E-01	%(P	1.175E+00	3.53E-01	G
RA-226	1.2331E+00						
		185.99	1.233E+00	@(	1.090E+00	3.43E-01	G
AC-228	7.3572E-01						
		911.07	7.225E-01	*(P	1.681E-01	8.45E-02	G K
		968.90	8.413E-01	@(P	3.504E-01	1.65E-01	G
		338.40	6.142E-01	(P	2.913E-01	1.14E-01	G
TH-227	-2.5086E-01						
		236.00	-2.509E-01	%(P	4.103E-01	1.25E-01	G K
		256.25	-1.230E-01	% P	5.100E-01	1.51E-01	G
PA-234	-6.8281E-03						
		98.44	-6.828E-03	%(	1.721E-01	5.12E-02	G K
		946.00	-3.195E-02	&	2.642E-01	7.53E-02	G
		131.28	-7.311E-02	%	2.047E-01	6.18E-02	G
		94.67	-8.753E-02	&	3.036E-01	9.14E-02	G
		883.24	6.032E-02	&	3.503E-01	9.98E-02	G
		926.70	-6.435E-02	&	4.635E-01	1.32E-01	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26 1.112E-01 %   3.594E-01 1.06E-01 G

TH-234       9.6602E-02
                           63.29 9.660E-02 &(P 1.986E+00 5.89E-01 G K
                           92.80 7.938E-01 % P 1.568E+00 4.75E-01 G
                           92.38-2.632E-01 % P 1.963E+00 5.83E-01 G

AM-241       3.8220E-02
                           59.54 3.822E-02 %(P 2.709E-01 8.09E-02 G
   ( - This peak used in the nuclide activity average.

   * - Peak is too wide, but only one peak in library.
   ! - Peak is part of a multiplet and this area went
       negative during deconvolution.
   ? - Peak is too narrow.
   @ - Peak is too wide at FW25M, but ok at FWHM.
   % - Peak fails sensitivity test.
   $ - Peak identified, but first peak of this nuclide
       failed one or more qualification tests.
   + - Peak activity higher than counting uncertainty range.
   - - Peak activity lower than counting uncertainty range.
   = - Peak outside analysis energy range.
   & - Calculated peak centroid is not close enough to the
       library energy centroid for positive identification.
   P - Peakbackground subtraction
   } - Peak is too close to another for the activity
       to be found directly.

   Nuclide Codes:                      Peak Codes:
   T - Thermal Neutron Activation      G - Gamma Ray
   F - Fast Neutron Activation         X - X-Ray
   I - Fission Product                 P - Positron Decay
   N - Naturally Occurring Isotope     S - Single-Escape
   P - Photon Reaction                 D - Double-Escape
   C - Charged Particle Reaction       K - Key Line
   M - No MDA Calculation              A - Not in Average
   R - Coincidence Corrected           C - Coincidence Peak
   H - Halflife limit exceeded

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
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***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	1.6043E-01	1.6419E-01	3.1331E-01	3.1344E-01	3.365E-01
K-40		1.2302E+01	1.2302E+01	1.6030E+00	1.7472E+00	
MN-54	#A	1.4667E-02	1.4725E-02	3.6606E-02	3.6616E-02	4.111E-02
CO-57	#B	-6.2915E-03	-6.3203E-03	4.1150E-02	4.1151E-02	4.574E-02
CO-60	#B	1.9443E-03	1.9455E-03	3.9588E-02	3.9588E-02	4.886E-02

Sr-85	#A	-9.6752E-03	-9.8613E-03	4.5337E-02	4.5341E-02	5.036E-02
Kr-85	#A	-2.4882E+02	-2.4882E+02	1.2578E+03	1.2579E+03	1.168E+03
Y-88	#B	0.0000E+00	0.0000E+00	8.8514E-03	8.8529E-03	2.149E-02
NB-94	#B	2.6903E-04	2.6903E-04	3.1092E-02	3.1092E-02	3.819E-02
Ag-108M	#B	-1.2281E-02	-1.2281E-02	4.3591E-02	4.3597E-02	4.968E-02
CD-109	#A	5.6365E-03	5.6519E-03	1.2145E+00	1.2145E+00	1.356E+00
SN-113	#B	-5.5605E-03	-5.6205E-03	5.4016E-02	5.4017E-02	6.110E-02
SB-125	#B	1.9242E-02	1.9266E-02	1.0443E-01	1.0444E-01	1.193E-01
I-131	#B	-2.1841E-04	-2.5468E-04	4.0587E-02	4.0587E-02	4.040E-02
CS-134	#B	-8.2646E-04	-8.2781E-04	3.4353E-01	3.4353E-01	3.988E-02
CS-137	#A	1.6199E-02	1.6201E-02	4.3850E-02	4.3860E-02	4.951E-02
CE-139	#A	9.1361E-04	9.2185E-04	4.0318E-02	4.0318E-02	4.504E-02
EU-152	#B	1.8901E-02	1.8906E-02	9.2140E-02	9.2146E-02	1.031E-01
EU-154	#B	-2.2575E-02	-2.2584E-02	8.7521E-02	8.7530E-02	9.119E-02
EU-155	#	1.4733E-01	1.4743E-01	1.3547E-01	1.3572E-01	1.456E-01
HG-203	#B	1.7077E-02	1.7536E-02	3.6260E-02	3.6274E-02	3.896E-02
TL-208		1.9195E-01	1.9195E-01	6.5081E-02	6.5979E-02	
PB-212	#	5.6929E-01	5.6929E-01	1.1657E-01	1.2093E-01	9.777E-02
PB-214		4.4334E-01	4.4334E-01	1.1959E-01	1.2219E-01	
BI-212	#A	3.2421E-01	3.2421E-01	3.4539E-01	3.4587E-01	3.560E-01
BI-214		3.8287E-01	3.8287E-01	1.2849E-01	1.3030E-01	
RA-224	#A	3.4997E-01	3.4997E-01	1.0578E+00	1.0580E+00	1.175E+00
RA-226	#	1.2331E+00	1.2331E+00	1.0280E+00	1.0304E+00	1.090E+00
AC-228		7.3572E-01	7.3572E-01	2.1623E-01	2.2019E-01	
TH-227	#B	-2.5086E-01	-2.5086E-01	3.8082E-01	3.8109E-01	4.103E-01
PA-234	#B	-6.8281E-03	-6.8281E-03	1.5358E-01	1.5358E-01	1.721E-01
TH-234	#B	9.6602E-02	9.6602E-02	1.7674E+00	1.7674E+00	1.986E+00
AM-241	#A	3.8220E-02	3.8220E-02	2.4264E-01	2.4265E-01	2.709E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (295.1 to 1999.1 keV) 1.4056245E+01 pCi/gm
Total Decayed Activity (295.1 to 1999.1 keV) 1.4056245E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JPK

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 101F_13SEPT2006_1101.An1

Sample description
FSS-OOL-05-09-001-F

Spectrum Filename: C:\GammaVision\Spectra\101F_13SEPT2006_1101.An1

Acquisition information

Start time:	13-Sep-2006 11:01:51
Live time:	2000
Real time:	2002
Dead time:	0.10 %
Detector ID:	1

Detector system
Det 101- DSPE-633

Calibration

Filename:	D1_1LSa.Clb

Detector 101 1.0 Liter Marinelli Sand

Energy Calibration

Created:	03-Sep-2004 08:50:48
Zero offset:	0.244 keV
Gain:	0.500 keV/channel
Quadratic:	-2.493E-08 keV/channel^2

Efficiency Calibration

Created:	03-Sep-2004 08:52:26
Type:	Polynomial
Uncertainty:	0.626 %
Coefficients:	-0.321775 -5.816463 0.734234
	-0.099357 0.006049 -0.000149

Library Files

Main analysis library:	FSS_Rev_1.Lib
Library Match Width:	1.000
Peak stripping:	Library based

Analysis parameters

Analysis engine:	Env32 G53W4.20
Start channel:	100 (50.23keV)
Stop channel:	4000 (1999.11keV)
Peak rejection level:	41.667%
Peak search sensitivity:	3
Sample Size:	1.7100E+03
Activity scaling factor:	1.0000E+06/(1.0000E+00* 1.7100E+03) = 5.8480E+02
Detection limit method:	Nureg 4.16
Random error:	1.0000000E+00
Systematic error:	1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	11-Sep-2006 13:55:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	101_150K_28APR05.Pbc 01-May-2005 05:24:47
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 12 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.1161

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
74.91	156.	25.56	1.50	1.654E-02				
74.91	156.	25.56	1.50	1.654E-02	74.81	9.600	7.752E-01	PB212
77.09	210.	18.56	1.50	1.720E-02	77.11	10.700	9.015E-01	PB214
					77.11	17.500	5.512E-01	PB212
77.09	214.	18.56	1.50	1.720E-02	77.11	10.700	9.015E-01	PB214
					77.11	17.500	5.610E-01	PB212
89.78	59.	37.95	1.02	1.956E-02				
93.43	89.	27.22	1.02	1.997E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
185.97	152.	19.91	1.41	1.858E-02				
185.97	152.	19.91	1.41	1.858E-02	185.99	3.280	1.968E+00	RA226
209.44	52.	39.22	1.05	1.721E-02				
238.71	475.	5.57	1.12	1.557E-02	238.63	43.100	5.516E-01	PB212
241.75	69.	27.89	1.12	1.541E-02	241.00	3.900	PBC<MDA	RA224
					241.92	7.470	PBC<MDA	PB214
269.69	58.	33.09	1.64	1.403E-02				
277.13	57.	33.15	0.91	1.369E-02				
277.13	57.	33.15	0.91	1.369E-02	279.17	81.500	4.179E-02	HG203
295.26	111.	14.21	1.16	1.292E-02				
295.26	111.	14.21	1.16	1.292E-02	295.22	19.200	3.477E-01	PB214
300.17	37.	35.61	1.16	1.272E-02				
327.72	48.	38.40	0.78	1.171E-02				
338.35	102.	18.15	1.27	1.135E-02	338.40	12.010	5.816E-01	AC228
351.99	198.	9.95	1.30	1.092E-02	351.99	37.100	3.830E-01	PB214
463.17	76.	23.39	1.02	8.348E-03				
463.17	76.	23.39	1.02	8.348E-03	463.51	10.000	7.025E-01	SB125
511.21	82.	20.20	1.69	7.583E-03	510.72	22.500	3.034E-01	TL208

582.92	177.	11.10	1.57	6.687E-03	583.14	86.000	2.398E-01	TL208
609.28	151.	11.43	1.09	6.413E-03	609.32	46.090	4.002E-01	BI214
661.36	69.	23.44	1.33	5.940E-03	661.62	84.620	1.072E-01	CS137
726.11	45.	25.69	1.96	5.450E-03				
726.11	45.	25.69	1.96	5.450E-03	727.17	11.800	5.417E-01	BI212
911.19	91.	12.34	1.34	4.446E-03	911.07	29.000	5.487E-01	AC228
969.01	90.	20.01	1.58	4.212E-03	968.90	17.460	9.551E-01	AC228
1121.10	38.	25.15	1.29	3.711E-03	1120.28	15.040	5.355E-01	BI214
1460.49	500.	4.53	2.09	2.943E-03	1460.75	10.700	1.249E+01	K40
1764.21	25.	20.00	1.54	2.481E-03	1764.51	15.920	4.914E-01	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
179.14	89.87	222.	59.	0.030	113.84	1.016	PB-214	lD
418.55	209.44	167.	52.	0.026	117.66	1.054	AC-228	s
477.12	238.67	112.	475.	0.237	16.71	1.122	PB-212	D
483.20	241.71	151.	69.	0.035	83.66	1.124	PB-214	D
539.10	269.69	127.	58.	0.029	99.28	1.637	AC-228	s
599.92	300.08	83.	37.	0.018	115.53	1.249	PB-212	
655.21	327.72	110.	48.	0.024	115.20	0.776	AC-228	
926.24	463.17	94.	49.	0.025	93.63	1.025	AC-228	s

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-212	149.39	74.91	771.	156.	0.078	76.67	1.499s
PB-214	153.79	77.11	684.	210.	0.105	55.69	1.499D
PB-212	153.79	77.11	680.	214.	0.107	55.69	1.499D
TH-234	185.72	93.07	635.	101.	0.051	98.76	1.499s
TH-234	185.71	93.07	597.	112.	0.056	91.19	1.499s
RA-226	371.96	186.15	294.	113.	0.057	70.15	1.499s
PB-212	477.04	238.67	302.	376.	0.188	24.49	1.499
HG-203	554.27	277.27	115.	45.	0.022	111.09	1.499s
PB-214	590.27	295.26	148.	102.	0.051	57.68	1.499
AC-228	676.48	338.35	100.	100.	0.050	54.46	1.268s
PB-214	703.78	351.99	67.	188.	0.094	28.27	1.499D
TL-208	1022.37	511.21	75.	66.	0.033	60.60	1.692s
TL-208	1165.85	582.92	70.	174.	0.087	33.30	1.574
BI-214	1218.60	609.28	53.	150.	0.075	34.28	1.087s
CS-137	1322.81	661.36	56.	68.	0.034	70.31	1.329s
BI-212	1454.12	726.98	37.	28.	0.014	105.77	1.499s
AC-228	1822.73	911.19	17.	90.	0.045	37.03	1.342
AC-228	1938.43	969.01	51.	89.	0.044	60.03	1.581
BI-214	2242.79	1121.10	21.	38.	0.019	75.44	1.292s
K-40	2921.99	1460.49	5.	498.	0.249	13.59	2.094
BI-214	3529.86	1764.21	0.	25.	0.012	60.00	1.541

s - Peak fails shape tests.
D - Peak area deconvoluted.

A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Code	MDA Value pCi/gm	COMMENTS
BE-7		7.1834E-02					
			477.56	7.183E-02	%(	3.532E-01 1.03E-01	G
K-40		1.2490E+01					
			1460.75	1.249E+01	(P	3.393E-01 5.68E-01	G
MN-54		2.8321E-03					
			834.81	2.832E-03	&(P	4.130E-02 1.13E-02	G
CO-57		0.0000E+00					
			122.07	0.000E+00	%(	4.290E-02 1.27E-02	G K
			136.43	7.256E-02	%	3.655E-01 1.09E-01	G
CO-60		1.0362E-02					
			1332.51	1.036E-02	%(P	5.426E-02 1.53E-02	G K
			1173.23	2.927E-02	& P	7.172E-02 2.15E-02	G K
Sr-85		-1.1840E-02					
			514.00	-1.184E-02	%(	5.482E-02 1.62E-02	G
Kr-85		-2.9612E+02					
			513.99	-2.961E+02	%(P	1.247E+03 3.65E+02	G
Y-88		0.0000E+00					
			1836.01	0.000E+00	%(	1.025E-01 2.83E-02	G K
			898.02	1.339E-02	% P	5.090E-02 1.48E-02	G
NB-94		-1.8647E-03					
			871.10	-1.865E-03	%(P	4.088E-02 1.11E-02	G K
			702.50	1.263E-03	% P	4.564E-02 1.28E-02	G K
Ag-108M		-1.0348E-02					
			722.95	-1.035E-02	%(	6.382E-02 1.85E-02	G K
			614.37	-1.993E-02	& P	5.603E-02 1.67E-02	G
			433.93	-6.202E-03	%	3.914E-02 1.13E-02	G
CD-109		2.2860E-01					
			88.04	2.286E-01	%(P	1.149E+00 3.43E-01	G
SN-113		8.4657E-03					
			391.71	8.466E-03	&(	5.246E-02 1.52E-02	G K
			255.04	-3.867E-01	% P	1.710E+00 5.07E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	2.1887E-03						
		427.95	2.189E-03	%(P	1.239E-01	3.52E-02	G K
		600.77	-2.127E-02	& P	2.418E-01	6.88E-02	G
		636.15	8.537E-02	% P	2.759E-01	8.04E-02	G
		463.51	2.348E-01	% P	4.105E-01	1.25E-01	G
		176.29	-1.452E-02	& P	5.634E-01	1.65E-01	G
I-131	1.0153E-02						
		364.48	1.015E-02	%(	4.659E-02	1.37E-02	G K
		636.97	2.600E-01	%	5.424E-01	1.65E-01	G
		284.29	1.221E-02	&	7.758E-01	2.26E-01	G
CS-134	4.0564E-03						
		604.66	4.056E-03	%(P	3.317E-02	9.26E-03	G K
		795.76	2.909E-02	% P	5.461E-02	1.67E-02	G
		569.29	1.092E-01	& P	2.237E-01	6.79E-02	G
		801.84	-7.728E-02	%	5.538E-01	1.58E-01	G
CS-137	1.0715E-01						
		661.62	1.072E-01	*(P	5.906E-02	2.54E-02	G
CE-139	1.0646E-02						
		165.85	1.065E-02	%(P	4.391E-02	1.31E-02	G
EU-152	-3.9239E-02						
		121.78	-3.924E-02	%(P	1.329E-01	3.99E-02	G K
		344.30	-2.011E-03	& P	1.300E-01	3.71E-02	G
		1408.08	9.711E-02	% P	1.216E-01	4.34E-02	G
		964.00	2.636E-01	% P	4.116E-01	1.28E-01	G
		1112.07	-2.824E-02	& P	4.623E-01	1.29E-01	G
		778.90	-3.009E-02	% P	3.540E-01	9.93E-02	G
EU-154	2.0480E-04						
		123.10	2.048E-04	%(P	9.587E-02	2.83E-02	G K
		1274.80	-1.954E-02	% P	1.654E-01	4.61E-02	G
		723.30	-5.139E-02	& P	2.963E-01	8.58E-02	G
		1004.80	6.832E-02	% P	2.783E-01	8.02E-02	G
EU-155	6.0507E-02						
		86.45	6.051E-02	%(	1.134E-01	3.45E-02	G K
		105.31	-6.775E-02	%	1.608E-01	4.86E-02	G
HG-203	3.2829E-02						
		279.17	3.283E-02	&(	3.864E-02	1.22E-02	G K
		72.87	-4.769E-01	% P	1.141E+00	3.44E-01	G
		70.83	-8.643E-01	&	2.065E+00	6.25E-01	G
		82.50	2.822E-01	%	2.378E+00	7.09E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	2.5298E-01						
		583.14	2.398E-01	(P	5.716E-02	2.70E-02	G
		510.72	3.034E-01	*(P	1.998E-01	7.63E-02	G
PB-212	4.4308E-01						
		238.63	4.431E-01	(P	9.859E-02	3.68E-02	G K
							Energy duplication
		77.11	5.610E-01	+	3.261E-01	1.04E-01	G
		74.81	7.752E-01	& P	6.576E-01	2.05E-01	G
PB-214	3.5151E-01						
							Energy duplication
		351.99	3.657E-01	(P	7.951E-02	3.48E-02	G K
		295.22	3.242E-01	(P	1.893E-01	6.34E-02	G
							Energy duplication
		77.11	9.015E-01	+ P	5.347E-01	1.70E-01	G
		241.92	-2.033E-02	% P	7.204E-01	2.13E-01	G
BI-212	3.4187E-01						
		727.17	3.419E-01	*(P	3.812E-01	1.23E-01	G K
		1620.56	0.000E+00	%	7.897E-01	1.07E-01	G
		785.42	8.514E-01	& P	2.205E+00	6.57E-01	G
BI-214	4.4547E-01						
		609.32	4.002E-01	@(P	9.822E-02	4.61E-02	G K
		1764.51	4.914E-01	(P	1.474E-01	1.00E-01	G
		1120.28	5.355E-01	*(P	3.421E-01	1.36E-01	G
RA-224	6.8464E-01						
		241.00	6.846E-01	%(P	1.183E+00	3.61E-01	G
RA-226	1.4684E+00						
		185.99	1.468E+00	*(	1.071E+00	3.43E-01	G
AC-228	5.5833E-01						
		911.07	5.487E-01	(P	1.360E-01	6.91E-02	G K
		968.90	9.551E-01	+ P	3.871E-01	1.93E-01	G
		338.40	5.816E-01	@(P	2.855E-01	1.08E-01	G
TH-227	-1.0279E-01						
		236.00	-1.028E-01	%(P	4.382E-01	1.31E-01	G K
		256.25	5.316E-02	% P	5.208E-01	1.53E-01	G
PA-234	-2.1077E-02						
		98.44	-2.108E-02	&(	1.524E-01	4.53E-02	G K
		946.00	-1.237E-02	&	2.600E-01	7.21E-02	G
		131.28	7.889E-02	%	1.713E-01	5.19E-02	G
		94.67	7.882E-04	&	2.838E-01	8.40E-02	G
		883.24	0.000E+00	%	3.903E-01	1.07E-01	G
		926.70	1.100E-03	%	4.134E-01	1.12E-01	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26 1.666E-01 &   3.294E-01 1.00E-01 G

TH-234       1.1410E+00
                           63.29 5.924E-01 %(P 1.947E+00 5.83E-01 G K
                           92.80 1.489E+00  (P 1.543E+00 4.77E-01 G
                           92.38 1.568E+00 &(P 1.861E+00 5.71E-01 G

AM-241      -4.9742E-03
                           59.54-4.974E-03 %(P 2.891E-01 8.56E-02 G
   ( - This peak used in the nuclide activity average.

   * - Peak is too wide, but only one peak in library.
   ! - Peak is part of a multiplet and this area went
       negative during deconvolution.
   ? - Peak is too narrow.
   @ - Peak is too wide at FW25M, but ok at FWHM.
   % - Peak fails sensitivity test.
   $ - Peak identified, but first peak of this nuclide
       failed one or more qualification tests.
   + - Peak activity higher than counting uncertainty range.
   - - Peak activity lower than counting uncertainty range.
   = - Peak outside analysis energy range.
   & - Calculated peak centroid is not close enough to the
       library energy centroid for positive identification.
   P - Peakbackground subtraction
   } - Peak is too close to another for the activity
       to be found directly.

   Nuclide Codes:                      Peak Codes:
   T - Thermal Neutron Activation      G - Gamma Ray
   F - Fast Neutron Activation         X - X-Ray
   I - Fission Product                 P - Positron Decay
   N - Naturally Occurring Isotope     S - Single-Escape
   P - Photon Reaction                 D - Double-Escape
   C - Charged Particle Reaction       K - Key Line
   M - No MDA Calculation              A - Not in Average
   R - Coincidence Corrected           C - Coincidence Peak
   H - Halflife limit exceeded

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
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***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	7.0102E-02	7.1834E-02	3.0794E-01	3.0797E-01	3.446E-01
K-40		1.2490E+01	1.2490E+01	1.7049E+00	1.8452E+00	
MN-54	#A	2.8203E-03	2.8321E-03	3.3994E-02	3.3994E-02	4.112E-02
CO-57	#B	0.0000E+00	0.0000E+00	3.7975E-02	3.7975E-02	4.269E-02
CO-60	#B	1.0355E-02	1.0362E-02	4.5822E-02	4.5826E-02	5.422E-02

Sr-85	#A	-1.1604E-02	-1.1840E-02	4.8452E-02	4.8456E-02	5.373E-02
Kr-85	#A	-2.9612E+02	-2.9612E+02	1.3311E+03	1.3312E+03	1.247E+03
Y-88	#B	0.0000E+00	0.0000E+00	8.5002E-02	8.5002E-02	1.012E-01
NB-94	#B	-1.8647E-03	-1.8647E-03	4.2539E-02	4.2539E-02	4.088E-02
Ag-108M	#B	-1.0348E-02	-1.0348E-02	5.5518E-02	5.5521E-02	6.381E-02
CD-109	#A	2.2794E-01	2.2860E-01	1.0301E+00	1.0302E+00	1.146E+00
SN-113	#B	8.3704E-03	8.4657E-03	4.5702E-02	4.5704E-02	5.186E-02
SB-125	#B	2.1859E-03	2.1887E-03	1.0564E-01	1.0564E-01	1.237E-01
I-131	#B	8.6336E-03	1.0153E-02	4.0972E-02	4.0976E-02	3.962E-02
CS-134	#B	4.0494E-03	4.0564E-03	2.7777E-02	2.7778E-02	3.311E-02
CS-137	#	1.0714E-01	1.0715E-01	7.6314E-02	7.6554E-02	
CE-139	#A	1.0545E-02	1.0646E-02	3.9343E-02	3.9348E-02	4.350E-02
EU-152	#B	-3.9228E-02	-3.9239E-02	1.2584E-01	1.2586E-01	1.328E-01
EU-154	#B	2.0472E-04	2.0480E-04	8.4975E-02	8.4975E-02	9.583E-02
EU-155	#B	6.0463E-02	6.0507E-02	1.0347E-01	1.0353E-01	1.133E-01
HG-203	#A	3.1924E-02	3.2829E-02	3.6469E-02	3.6516E-02	3.757E-02
TL-208		2.5298E-01	2.5298E-01	8.5388E-02	8.6576E-02	
PB-212	#	4.4308E-01	4.4308E-01	1.1028E-01	1.1308E-01	9.859E-02
PB-214	#	3.5151E-01	3.5151E-01	1.0044E-01	1.0238E-01	7.951E-02
BI-212	#A	3.4187E-01	3.4187E-01	3.7042E-01	3.7092E-01	3.812E-01
BI-214		4.4547E-01	4.4547E-01	1.5381E-01	1.5586E-01	
RA-224	#A	6.8464E-01	6.8464E-01	1.0821E+00	1.0828E+00	1.183E+00
RA-226	#	1.4684E+00	1.4684E+00	1.0301E+00	1.0335E+00	1.071E+00
AC-228		5.5833E-01	5.5833E-01	1.8781E-01	1.9044E-01	
TH-227	#B	-1.0279E-01	-1.0279E-01	4.0814E-01	4.0818E-01	4.382E-01
PA-234	#B	-2.1077E-02	-2.1077E-02	1.3602E-01	1.3602E-01	1.524E-01
TH-234	#B	1.1410E+00	1.1410E+00	1.0976E+00	1.0995E+00	1.947E+00
AM-241	#A	-4.9742E-03	-4.9742E-03	6.8533E-01	6.8533E-01	2.891E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (269.6 to 1999.1 keV) 1.3854294E+01 pCi/gm
Total Decayed Activity (269.6 to 1999.1 keV) 1.3854307E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JPK

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 101F_13SEPT2006_1141.An1

Sample description
FSS-OOL-05-09-011-F

Spectrum Filename: C:\GammaVision\Spectra\101F_13SEPT2006_1141.An1

Acquisition information

Start time:	13-Sep-2006 11:41:17
Live time:	2000
Real time:	2002
Dead time:	0.10 %
Detector ID:	1

Detector system
Det 101- DSPE-633

Calibration

Filename:	D1_1LSa.Clb

Detector 101 1.0 Liter Marinelli Sand

Energy Calibration

Created:	03-Sep-2004 08:50:48
Zero offset:	0.244 keV
Gain:	0.500 keV/channel
Quadratic:	-2.493E-08 keV/channel^2

Efficiency Calibration

Created:	03-Sep-2004 08:52:26
Type:	Polynomial
Uncertainty:	0.626 %
Coefficients:	-0.321775 -5.816463 0.734234
	-0.099357 0.006049 -0.000149

Library Files

Main analysis library:	FSS_Rev_1.Lib
Library Match Width:	1.000
Peak stripping:	Library based

Analysis parameters

Analysis engine:	Env32 G53W4.20
Start channel:	100 (50.23keV)
Stop channel:	4000 (1999.11keV)
Peak rejection level:	41.667%
Peak search sensitivity:	3
Sample Size:	1.7000E+03
Activity scaling factor:	1.0000E+06/(1.0000E+00* 1.7000E+03) = 5.8824E+02
Detection limit method:	Nureg 4.16
Random error:	1.0000000E+00
Systematic error:	1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	11-Sep-2006 14:16:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	101_150K_28APR05.Pbc 01-May-2005 05:24:47
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 14 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.1003

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
74.85	251.	12.12	1.00	1.651E-02	74.81	9.600	1.231E+00	PB212
77.12	280.	9.66	1.01	1.720E-02	77.11	17.500	9.244E-01	PB212
					77.11	10.700	1.496E+00	PB214
87.30	113.	24.38	1.01	1.925E-02				
89.61	83.	31.18	1.02	1.955E-02	88.04	3.790	PBC<MDA	CD109
93.36	126.	20.31	1.02	1.997E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
186.14	95.	30.03	1.56	1.857E-02	185.99	3.280	1.236E+00	RA226
238.79	630.	4.68	1.12	1.557E-02	238.63	43.100	7.389E-01	PB212
241.70	110.	18.99	1.12	1.541E-02	241.00	3.900	1.441E+00	RA224
					241.92	7.470	7.550E-01	PB214
295.20	162.	14.80	1.07	1.292E-02	295.22	19.200	5.150E-01	PB214
338.29	134.	17.09	1.31	1.135E-02	338.40	12.010	7.693E-01	AC228
352.00	291.	9.45	1.13	1.092E-02	351.99	37.100	5.665E-01	PB214
462.87	40.	33.16	1.50	8.342E-03	463.51	10.000	PBC<MDA	SB125
510.93	97.	17.30	1.57	7.587E-03	510.72	22.500	3.787E-01	TL208
565.62	18.	37.62	1.50	6.839E-03	569.26	10.400	PBC<MDA	PA234
583.18	197.	10.87	1.52	6.684E-03	583.14	86.000	2.694E-01	TL208
609.42	257.	9.63	1.49	6.412E-03	609.32	46.090	6.888E-01	BI214
727.08	52.	25.45	1.34	5.444E-03	727.17	11.800	6.364E-01	BI212
860.41	34.	26.48	1.57	4.678E-03				
911.32	127.	12.67	1.40	4.445E-03	911.07	29.000	7.689E-01	AC228
968.53	106.	18.56	1.33	4.214E-03	968.90	17.460	1.136E+00	AC228
1120.30	60.	26.20	0.59	3.711E-03	1120.28	15.040	8.577E-01	BI214
1460.60	595.	4.22	1.49	2.943E-03	1460.75	10.700	1.495E+01	K40
1763.82	30.	18.26	1.79	2.481E-03	1764.51	15.920	5.949E-01	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
174.18	87.50	322.	113.	0.056	73.14	1.014	PB-214	lD
178.80	89.81	293.	83.	0.042	93.54	1.015	PB-214	lD
1721.11	860.41	21.	34.	0.017	79.45	1.565	TL-208	s

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-212	149.19	74.81	288.	244.	0.122	34.34	1.005D
PB-212	153.79	77.11	328.	280.	0.140	28.97	1.006A
TH-234	185.42	92.92	732.	119.	0.060	91.58	1.499s
TH-234	185.57	93.00	687.	129.	0.064	85.99	1.499s
RA-226	372.27	186.31	375.	91.	0.045	95.99	1.499s
PB-212	476.96	238.63	131.	624.	0.312	14.12	1.122D
RA-224	483.23	241.77	368.	88.	0.044	96.70	1.499s
PB-214	483.54	241.92	122.	105.	0.052	53.23	1.124D
PB-214	590.15	295.20	168.	161.	0.080	44.41	1.066s
AC-228	676.36	338.29	137.	132.	0.066	51.27	1.310
PB-214	703.80	352.00	147.	289.	0.144	28.35	1.134
SB-125	925.63	462.87	75.	40.	0.020	99.47	1.499s
TL-208	1021.81	510.93	83.	81.	0.041	51.90	1.571s
PA-234	1131.24	565.62	14.	18.	0.009	112.87	1.499
TL-208	1166.37	583.18	75.	195.	0.097	32.60	1.522
BI-214	1218.87	609.42	88.	256.	0.128	28.88	1.492
BI-212	1454.95	727.40	30.	28.	0.014	97.64	1.499
AC-228	1822.98	911.32	40.	125.	0.062	38.00	1.400
AC-228	1937.48	968.53	69.	105.	0.053	55.67	1.333s
BI-214	2241.19	1120.30	51.	60.	0.030	78.61	0.594s
K-40	2922.22	1460.60	10.	592.	0.296	12.66	1.491
BI-214	3529.07	1763.82	0.	30.	0.015	54.77	1.790

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	MDA Value pCi/gm		COMMENTS
BE-7		-7.7083E-02						
			477.56	-7.708E-02	&(	4.693E-01	1.37E-01	G
K-40		1.4955E+01						
			1460.75	1.495E+01	(P	4.345E-01	6.33E-01	G
MN-54		2.1204E-02						
			834.81	2.120E-02	%(P	4.837E-02	1.45E-02	G
CO-57		7.6981E-03						
			122.07	7.698E-03	&(	4.926E-02	1.47E-02	G K
			136.43	-4.075E-02	%	4.049E-01	1.21E-01	G
CO-60		1.2790E-02						
			1332.51	1.279E-02	%(P	5.189E-02	1.48E-02	G K
			1173.23	-1.452E-02	% P	6.733E-02	1.94E-02	G K
Sr-85		-1.0235E-02						
			514.00	-1.023E-02	%(	5.852E-02	1.72E-02	G
Kr-85		-2.6013E+02						
			513.99	-2.601E+02	%(P	1.330E+03	3.89E+02	G
Y-88		-7.9918E-03						
			1836.01	-7.992E-03	%(	5.644E-02	1.53E-02	G K
			898.02	1.295E-02	% P	5.301E-02	1.53E-02	G
NB-94		1.4231E-02						
			871.10	1.423E-02	%(P	5.043E-02	1.47E-02	G K
			702.50	5.367E-03	% P	4.716E-02	1.34E-02	G K
Ag-108M		1.7087E-03						
			722.95	1.709E-03	%(	8.540E-02	2.47E-02	G K
			614.37	-1.968E-03	% P	5.093E-02	1.44E-02	G
			433.93	4.978E-03	%	4.402E-02	1.27E-02	G
CD-109		2.6802E-01						
			88.04	2.680E-01	%(P	1.477E+00	4.43E-01	G
SN-113		-1.6480E-02						
			391.71	-1.648E-02	%(	6.512E-02	1.93E-02	G K
			255.04	-4.118E-01	& P	2.109E+00	6.27E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	1.1583E-01						
		427.95	2.591E-02	%(P	9.321E-02	2.72E-02	G K
		600.77	-3.758E-02	% P	2.448E-01	7.04E-02	G
		636.15	1.409E-01	% P	3.757E-01	1.12E-01	G
		463.51	3.820E-01	(P	4.117E-01	1.31E-01	G
		176.29	-8.639E-02	% P	6.265E-01	1.85E-01	G
I-131	1.3031E-02						
		364.48	1.303E-02	%(	5.281E-02	1.56E-02	G K
		636.97	2.795E-01	%	6.163E-01	1.86E-01	G
		284.29	1.522E-02	&	7.763E-01	2.26E-01	G
CS-134	-7.4060E-04						
		604.66	-7.406E-04	%(P	3.688E-02	1.01E-02	G K
		795.76	-2.759E-03	% P	6.477E-02	1.81E-02	G
		569.29	-8.381E-02	% P	2.701E-01	7.93E-02	G
		801.84	-7.776E-02	&	6.580E-01	1.88E-01	G
CS-137	8.3349E-03						
		661.62	8.335E-03	%(P	5.298E-02	1.51E-02	G
CE-139	3.0278E-03						
		165.85	3.028E-03	%(P	4.619E-02	1.37E-02	G
EU-152	-1.0083E-03						
		121.78	-1.008E-03	%(P	1.505E-01	4.46E-02	G K
		344.30	-2.835E-02	% P	1.489E-01	4.37E-02	G
		1408.08	8.386E-02	% P	2.339E-01	6.86E-02	G
		964.00	1.396E-01	% P	5.349E-01	1.57E-01	G
		1112.07	-1.200E-01	& P	5.801E-01	1.69E-01	G
		778.90	-1.494E-02	% P	3.596E-01	1.00E-01	G
EU-154	2.0656E-02						
		123.10	2.066E-02	&(P	9.636E-02	2.88E-02	G K
		1274.80	-7.276E-03	% P	1.935E-01	5.36E-02	G
		723.30	5.173E-03	& P	4.157E-01	1.20E-01	G
		1004.80	7.523E-02	% P	3.332E-01	9.64E-02	G
EU-155	-9.9072E-03						
		86.45	-9.907E-03	%(	1.504E-01	4.47E-02	G K
		105.31	-3.053E-02	%	2.108E-01	6.30E-02	G
HG-203	2.4888E-02						
		279.17	2.489E-02	&(	4.153E-02	1.27E-02	G K
		72.87	-6.309E-01	% P	1.300E+00	3.94E-01	G
		70.83	-3.270E-02	&	2.773E+00	8.29E-01	G
		82.50	5.731E-01	&	2.690E+00	8.07E-01	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments

TL-208       2.6940E-01
                          583.14 2.694E-01  (P 5.962E-02 2.96E-02 G
                          510.72 3.787E-01 + P 2.098E-01 7.85E-02 G

PB-212       7.3874E-01
                          238.63 7.387E-01  (P 6.630E-02 3.51E-02 G K
                                                          Energy duplication
                           77.11 7.387E-01 }   2.300E-01 7.13E-02 G
                           74.81 1.222E+00 + P 4.094E-01 1.43E-01 G

PB-214       5.4891E-01
                          351.99 5.665E-01  (P 1.162E-01 5.39E-02 G K
                          295.22 5.150E-01 @(P 2.024E-01 7.71E-02 G
                                                          Energy duplication
                           77.11 0.000E+00 } P 5.339E-01 0.00E+00 G
                          241.92 7.225E-01 + P 3.750E-01 1.29E-01 G

BI-212       3.4493E-01
                          727.17 3.449E-01 ?(P 3.472E-01 1.15E-01 G K
                         1620.56 2.614E-01 %   1.331E+00 3.57E-01 G
                          785.42 2.560E-01 % P 2.313E+00 6.52E-01 G

BI-214       6.6466E-01
                          609.32 6.888E-01  (P 1.248E-01 6.66E-02 G K
                         1764.51 5.949E-01  (P 1.483E-01 1.10E-01 G
                         1120.28 8.577E-01 + P 5.116E-01 2.26E-01 G

RA-224       1.1655E+00
                          241.00 1.166E+00  (P 1.215E+00 3.79E-01 G

RA-226       1.1823E+00
                          185.99 1.182E+00  (  1.213E+00 3.78E-01 G

AC-228       7.6903E-01
                          911.07 7.689E-01  (P 1.990E-01 9.89E-02 G K
                          968.90 1.136E+00 + P 4.474E-01 2.12E-01 G
                          338.40 7.693E-01  (P 3.340E-01 1.34E-01 G

TH-227       6.4257E-02
                          236.00 6.426E-02 %(P 3.101E-01 9.19E-02 G K
                          256.25-1.283E-01 % P 6.012E-01 1.78E-01 G

PA-234       5.4885E-02
                           98.44-6.613E-03 &(  1.981E-01 5.89E-02 G K
                          946.00 1.631E-02 %   3.054E-01 8.60E-02 G
                          131.28-1.568E-02 &   1.912E-01 5.67E-02 G
                           94.67-1.375E-01 %   3.107E-01 9.41E-02 G
                          883.24-2.430E-02 %   4.439E-01 1.24E-01 G
                          926.70-7.824E-02 %   5.239E-01 1.50E-01 G
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 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26 2.033E-01 ?(  2.274E-01 7.65E-02 G

TH-234       1.1524E+00
                           63.29 2.562E-01 %(P 2.317E+00 6.89E-01 G K
                           92.80 1.715E+00  (P 1.663E+00 5.15E-01 G
                           92.38 1.855E+00 &(P 2.007E+00 6.18E-01 G

AM-241       2.3154E-02
                           59.54 2.315E-02 %(P 2.605E-01 7.73E-02 G
   ( - This peak used in the nuclide activity average.

   * - Peak is too wide, but only one peak in library.
   ! - Peak is part of a multiplet and this area went
       negative during deconvolution.
   ? - Peak is too narrow.
   @ - Peak is too wide at FW25M, but ok at FWHM.
   % - Peak fails sensitivity test.
   $ - Peak identified, but first peak of this nuclide
       failed one or more qualification tests.
   + - Peak activity higher than counting uncertainty range.
   - - Peak activity lower than counting uncertainty range.
   = - Peak outside analysis energy range.
   & - Calculated peak centroid is not close enough to the
       library energy centroid for positive identification.
   P - Peakbackground subtraction
   } - Peak is too close to another for the activity
       to be found directly.

   Nuclide Codes:                      Peak Codes:
   T - Thermal Neutron Activation      G - Gamma Ray
   F - Fast Neutron Activation         X - X-Ray
   I - Fission Product                 P - Positron Decay
   N - Naturally Occurring Isotope     S - Single-Escape
   P - Photon Reaction                 D - Double-Escape
   C - Charged Particle Reaction       K - Key Line
   M - No MDA Calculation              A - Not in Average
   R - Coincidence Corrected           C - Coincidence Peak
   H - Halflife limit exceeded

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
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***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	-7.5212E-02	-7.7083E-02	4.1149E-01	4.1152E-01	4.579E-01
K-40		1.4955E+01	1.4955E+01	1.9002E+00	2.0796E+00	
MN-54	#A	2.1115E-02	2.1204E-02	4.3606E-02	4.3623E-02	4.816E-02
CO-57	#B	7.6608E-03	7.6981E-03	4.4107E-02	4.4110E-02	4.902E-02
CO-60	#B	1.2781E-02	1.2790E-02	4.4394E-02	4.4400E-02	5.186E-02

Sr-85	#A	-1.0030E-02	-1.0235E-02	5.1584E-02	5.1587E-02	5.735E-02
Kr-85	#A	-2.6012E+02	-2.6013E+02	1.4578E+03	1.4579E+03	1.330E+03
Y-88	#B	-7.8940E-03	-7.9918E-03	4.5774E-02	4.5776E-02	5.575E-02
NB-94	#B	1.4231E-02	1.4231E-02	4.4197E-02	4.4204E-02	5.043E-02
Ag-108M	#B	1.7087E-03	1.7087E-03	7.3956E-02	7.3956E-02	8.540E-02
CD-109	#A	2.6725E-01	2.6802E-01	1.3280E+00	1.3281E+00	1.473E+00
SN-113	#B	-1.6293E-02	-1.6480E-02	5.7802E-02	5.7809E-02	6.438E-02
SB-125	#F	1.1568E-01	1.1583E-01	1.1938E-01	1.1956E-01	9.309E-02
I-131	#B	1.1069E-02	1.3031E-02	4.6774E-02	4.6780E-02	4.486E-02
CS-134	#B	-7.3931E-04	-7.4060E-04	1.1364E+00	1.1364E+00	3.682E-02
CS-137	#A	8.3339E-03	8.3349E-03	4.5429E-02	4.5432E-02	5.297E-02
CE-139	#A	2.9990E-03	3.0278E-03	4.0954E-02	4.0954E-02	4.575E-02
EU-152	#B	-1.0080E-03	-1.0083E-03	2.0977E-01	2.0977E-01	1.504E-01
EU-154	#B	2.0647E-02	2.0656E-02	8.6402E-02	8.6410E-02	9.632E-02
EU-155	#B	-9.9000E-03	-9.9072E-03	1.3420E-01	1.3420E-01	1.503E-01
HG-203	#B	2.4197E-02	2.4888E-02	3.8213E-02	3.8239E-02	4.037E-02
TL-208		2.6940E-01	2.6940E-01	8.8902E-02	9.0196E-02	
PB-212		7.3874E-01	7.3874E-01	1.0533E-01	1.1330E-01	
PB-214		5.4891E-01	5.4891E-01	1.4604E-01	1.4930E-01	
BI-212	#A	3.4493E-01	3.4493E-01	3.4499E-01	3.4554E-01	3.472E-01
BI-214		6.6466E-01	6.6466E-01	1.9279E-01	1.9641E-01	
RA-224	#A	1.1655E+00	1.1655E+00	1.1361E+00	1.1381E+00	1.215E+00
RA-226	#A	1.1823E+00	1.1823E+00	1.1349E+00	1.1368E+00	1.213E+00
AC-228		7.6903E-01	7.6903E-01	2.4933E-01	2.5309E-01	
TH-227	#B	6.4257E-02	6.4257E-02	2.7582E-01	2.7585E-01	3.101E-01
PA-234	#B	5.4885E-02	5.4885E-02	6.1949E-02	6.2024E-02	1.981E-01
TH-234	#B	1.1524E+00	1.1524E+00	1.0385E+00	1.0405E+00	2.317E+00
AM-241	#A	2.3154E-02	2.3154E-02	2.3189E-01	2.3189E-01	2.605E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (295.1 to 1999.1 keV) 1.8290491E+01 pCi/gm
Total Decayed Activity (295.1 to 1999.1 keV) 1.8290491E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JPK

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 101F_13SEPT2006_1258.An1

Sample description
FSS-OOL-05-09-005-F

Spectrum Filename: C:\GammaVision\Spectra\101F_13SEPT2006_1258.An1

Acquisition information

Start time:	13-Sep-2006 12:59:00
Live time:	2000
Real time:	2002
Dead time:	0.09 %
Detector ID:	1

Detector system
Det 101- DSPE-633

Calibration

Filename:	D1_1LSa.Clb

Detector 101 1.0 Liter Marinelli Sand

Energy Calibration

Created:	03-Sep-2004 08:50:48
Zero offset:	0.244 keV
Gain:	0.500 keV/channel
Quadratic:	-2.493E-08 keV/channel^2

Efficiency Calibration

Created:	03-Sep-2004 08:52:26
Type:	Polynomial
Uncertainty:	0.626 %
Coefficients:	-0.321775 -5.816463 0.734234
	-0.099357 0.006049 -0.000149

Library Files

Main analysis library:	FSS_Rev_1.Lib
Library Match Width:	1.000
Peak stripping:	Library based

Analysis parameters

Analysis engine:	Env32 G53W4.20
Start channel:	100 (50.23keV)
Stop channel:	4000 (1999.11keV)
Peak rejection level:	41.667%
Peak search sensitivity:	3
Sample Size:	1.8290E+03
Activity scaling factor:	1.0000E+06/(1.0000E+00* 1.8290E+03) = 5.4675E+02
Detection limit method:	Nureg 4.16
Random error:	1.0000000E+00
Systematic error:	1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	11-Sep-2006 14:11:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	101_150K_28APR05.Pbc 01-May-2005 05:24:47
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 11 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.0220

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
74.87	95.	37.56	1.50	1.654E-02	72.87	6.400	PBC<MDA	HG203
					74.81	9.600	PBC<MDA	PB212
77.13	215.	16.92	1.50	1.720E-02	77.11	10.700	8.623E-01	PB214
					77.11	17.500	5.272E-01	PB212
77.13	219.	16.92	1.50	1.720E-02	77.11	10.700	8.623E-01	PB214
					77.11	17.500	5.363E-01	PB212
92.94	103.	32.27	1.50	1.989E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
92.97	101.	31.84	1.50	1.985E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
186.24	107.	24.71	1.13	1.857E-02	185.99	3.280	1.299E+00	RA226
238.75	386.	6.18	1.12	1.557E-02	238.63	43.100	4.176E-01	PB212
241.65	81.	22.97	1.12	1.542E-02	241.00	3.900	PBC<MDA	RA224
295.39	118.	14.00	1.12	1.291E-02	295.22	19.200	3.467E-01	PB214
300.44	56.	30.67	0.99	1.271E-02				
338.43	89.	21.40	1.02	1.135E-02	338.40	12.010	4.695E-01	AC228
351.98	215.	10.98	1.29	1.092E-02				
351.98	215.	10.98	1.29	1.092E-02	351.99	37.100	3.887E-01	PB214
510.79	88.	17.91	1.55	7.589E-03	510.72	22.500	3.135E-01	TL208
583.19	150.	14.38	1.24	6.684E-03	583.14	86.000	1.904E-01	TL208
609.34	152.	10.18	1.54	6.413E-03	609.32	46.090	3.760E-01	BI214
910.83	106.	13.00	1.37	4.448E-03	911.07	29.000	5.967E-01	AC228
968.89	60.	24.25	1.70	4.212E-03	968.90	17.460	5.905E-01	AC228
1120.39	75.	16.04	2.07	3.711E-03	1120.28	15.040	9.891E-01	BI214
1460.71	525.	4.47	2.00	2.943E-03	1460.75	10.700	1.226E+01	K40

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
477.19	238.65	91.	386.	0.193	18.54	1.122	PB-212	D
483.00	241.55	134.	81.	0.041	68.92	1.124	PB-214	D
600.64	300.44	98.	56.	0.028	92.01	0.993	PB-212	
703.75	351.98	253.	63.	0.031	114.29	1.291	PB-214	

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-212	149.30	74.87	670.	95.	0.048	112.68	1.499
PB-214	153.79	77.11	578.	215.	0.107	50.77	1.499D
PB-212	153.79	77.11	575.	219.	0.109	50.77	1.499D
TH-234	185.53	92.97	585.	101.	0.050	95.51	1.499s
TH-234	185.47	92.94	575.	103.	0.052	96.80	1.499s
RA-226	372.39	186.37	318.	85.	0.043	94.73	1.499
PB-212	477.15	238.72	290.	297.	0.148	29.21	1.499
RA-224	483.41	241.86	300.	74.	0.037	103.77	1.499
PB-214	590.37	295.31	104.	115.	0.057	46.10	1.499s
AC-228	676.65	338.43	99.	87.	0.043	64.19	1.015
PB-214	703.59	351.90	83.	151.	0.075	34.92	1.499
TL-208	1021.53	510.79	69.	72.	0.036	53.73	1.545s
TL-208	1166.38	583.19	80.	148.	0.074	43.13	1.235
BI-214	1218.71	609.34	36.	150.	0.075	30.53	1.540s
AC-228	1822.02	910.83	30.	104.	0.052	39.01	1.370s
AC-228	1938.19	968.89	43.	59.	0.029	72.76	1.704
BI-214	2241.36	1120.39	19.	75.	0.037	48.11	2.073s
K-40	2922.44	1460.71	9.	523.	0.261	13.40	2.001

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	Peak MDA Value pCi/gm	COMMENTS
BE-7		-1.8853E-02					
			477.56	-1.885E-02	%(	3.405E-01 9.68E-02	G
K-40		1.2262E+01					
			1460.75	1.226E+01	(P	4.003E-01 5.50E-01	G
MN-54		-2.2037E-03					
			834.81	-2.204E-03	%(P	3.576E-02 9.60E-03	G
CO-57		-4.6859E-03					
			122.07	-4.686E-03	&(	4.175E-02 1.24E-02	G K
			136.43	1.113E-02	%	2.959E-01 8.73E-02	G
CO-60		-1.3841E-03					
			1332.51	-1.384E-03	&(P	5.058E-02 1.35E-02	G K
			1173.23	1.796E-02	% P	5.088E-02 1.50E-02	G K
Sr-85		-1.7736E-02					
			514.00	-1.774E-02	%(	4.703E-02 1.41E-02	G
Kr-85		-4.2781E+02					
			513.99	-4.278E+02	%(P	1.070E+03 3.19E+02	G
Y-88		0.0000E+00					
			1836.01	0.000E+00	%(	2.321E-02 3.15E-03	G K
			898.02	9.179E-04	% P	5.120E-02 1.41E-02	G
NB-94		6.5197E-04					
			871.10	6.520E-04	&(P	3.145E-02 8.27E-03	G K
			702.50	9.662E-03	% P	4.671E-02 1.36E-02	G K
Ag-108M		7.1201E-03					
			722.95	7.120E-03	%(	4.218E-02 1.20E-02	G K
			614.37	2.470E-03	& P	4.056E-02 1.14E-02	G
			433.93	8.193E-03	&	3.149E-02 9.22E-03	G
CD-109		-4.3241E-02					
			88.04	-4.324E-02	&(P	1.265E+00 3.76E-01	G
SN-113		1.2603E-03					
			391.71	1.260E-03	&(	5.579E-02 1.60E-02	G K
			255.04	-1.339E-01	% P	1.540E+00 4.50E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	1.0129E-03						
		427.95	1.013E-03	&(P	1.045E-01	2.94E-02	G K
		600.77	-7.992E-03	% P	2.136E-01	5.99E-02	G
		636.15	3.679E-02	% P	3.491E-01	9.90E-02	G
		463.51	1.535E-01	% P	3.453E-01	1.04E-01	G
		176.29	-9.071E-02	& P	5.335E-01	1.58E-01	G
I-131	1.7853E-02						
		364.48	1.785E-02	%(	4.238E-02	1.28E-02	G K
		636.97	5.062E-02	%	5.992E-01	1.69E-01	G
		284.29	2.145E-02	&	6.707E-01	1.95E-01	G
CS-134	-2.3472E-02						
		604.66	-2.347E-02	%(P	5.539E-02	1.66E-02	G K
		795.76	-1.275E-02	% P	5.978E-02	1.73E-02	G
		569.29	3.562E-02	& P	2.367E-01	6.78E-02	G
		801.84	0.000E+00	%	6.220E-01	1.75E-01	G
CS-137	2.2051E-02						
		661.62	2.205E-02	%(P	3.850E-02	1.18E-02	G
CE-139	3.1657E-03						
		165.85	3.166E-03	%(P	3.606E-02	1.06E-02	G
EU-152	-1.5862E-02						
		121.78	-1.586E-02	&(P	1.260E-01	3.75E-02	G K
		344.30	1.971E-02	% P	1.015E-01	2.95E-02	G
		1408.08	-2.038E-03	% P	2.827E-01	7.60E-02	G
		964.00	5.760E-03	% P	4.231E-01	1.19E-01	G
		1112.07	-1.176E-01	% P	4.255E-01	1.24E-01	G
		778.90	-2.792E-03	% P	2.604E-01	6.98E-02	G
EU-154	-1.2499E-02						
		123.10	-1.250E-02	%(P	7.411E-02	2.20E-02	G K
		1274.80	-2.815E-05	% P	1.585E-01	4.29E-02	G
		723.30	6.739E-03	& P	1.914E-01	5.27E-02	G
		1004.80	2.575E-02	% P	2.527E-01	7.01E-02	G
EU-155	-2.5179E-03						
		86.45	-2.518E-03	&(	1.542E-01	4.58E-02	G K
		105.31	-1.541E-02	&	1.742E-01	5.18E-02	G
HG-203	-1.2685E-02						
		279.17	-1.268E-02	%(	4.339E-02	1.29E-02	G K
		72.87	3.465E-01	% P	8.955E-01	2.70E-01	G
		70.83	-1.048E+00	&	1.681E+00	5.13E-01	G
		82.50	-3.289E-01	%	2.137E+00	6.38E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	1.9038E-01						
		583.14	1.904E-01	(P	5.701E-02	2.78E-02	G
		510.72	3.135E-01	+ P	1.786E-01	6.86E-02	G
PB-212	3.2685E-01						
		238.63	3.268E-01	(P	9.033E-02	3.25E-02	G K
							Energy duplication
		77.11	5.363E-01	+	2.808E-01	9.08E-02	G
		74.81	4.442E-01	& P	5.740E-01	1.76E-01	G
PB-214	2.9727E-01						
		351.99	2.744E-01	(P	8.246E-02	3.24E-02	G K
		295.22	3.415E-01	@(P	1.494E-01	5.33E-02	G
							Energy duplication
		77.11	8.623E-01	+ P	4.607E-01	1.48E-01	G
		241.92	1.079E-01	% P	6.195E-01	1.85E-01	G
BI-212	1.0603E-01						
		727.17	1.060E-01	&(P	3.033E-01	8.92E-02	G K
		1620.56	2.972E-02	%	1.242E+00	3.00E-01	G
		785.42	8.910E-01	% P	1.764E+00	5.38E-01	G
BI-214	3.7595E-01						
		609.32	3.760E-01	@(P	7.629E-02	3.85E-02	G K
		1764.51	1.559E-01	% P	2.441E-01	7.88E-02	G
		1120.28	9.891E-01	+ P	3.068E-01	1.59E-01	G
RA-224	9.1111E-01						
		241.00	9.111E-01	&(P	1.023E+00	3.18E-01	G
RA-226	1.0306E+00						
		185.99	1.031E+00	(	1.040E+00	3.25E-01	G
AC-228	5.6871E-01						
		911.07	5.967E-01	*(P	1.614E-01	7.90E-02	G K
		968.90	5.905E-01	(P	3.350E-01	1.45E-01	G
		338.40	4.695E-01	(P	2.665E-01	1.03E-01	G
TH-227	-1.5581E-01						
		236.00	-1.558E-01	%(P	3.872E-01	1.17E-01	G K
		256.25	-6.252E-03	& P	4.326E-01	1.25E-01	G
PA-234	-1.1748E-03						
		98.44	-1.175E-03	&(	1.489E-01	4.40E-02	G K
		946.00	2.410E-02	%	2.464E-01	6.92E-02	G
		131.28	-3.077E-02	&	1.795E-01	5.36E-02	G
		94.67	-8.788E-02	%	2.897E-01	8.72E-02	G
		883.24	2.694E-02	%	3.647E-01	1.01E-01	G
		926.70	1.033E-01	&	3.710E-01	1.08E-01	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26 5.742E-02 &   3.488E-01 1.00E-01 G

TH-234       7.3143E-01
                           63.29-1.675E-01 %(P 1.861E+00 5.47E-01 G K
                           92.80 1.278E+00  (P 1.417E+00 4.37E-01 G
                           92.38 1.457E+00  (P 1.672E+00 5.14E-01 G

AM-241       2.5845E-02
                           59.54 2.585E-02 %(P 2.030E-01 6.01E-02 G
   ( - This peak used in the nuclide activity average.

   * - Peak is too wide, but only one peak in library.
   ! - Peak is part of a multiplet and this area went
       negative during deconvolution.
   ? - Peak is too narrow.
   @ - Peak is too wide at FW25M, but ok at FWHM.
   % - Peak fails sensitivity test.
   $ - Peak identified, but first peak of this nuclide
       failed one or more qualification tests.
   + - Peak activity higher than counting uncertainty range.
   - - Peak activity lower than counting uncertainty range.
   = - Peak outside analysis energy range.
   & - Calculated peak centroid is not close enough to the
       library energy centroid for positive identification.
   P - Peakbackground subtraction
   } - Peak is too close to another for the activity
       to be found directly.

   Nuclide Codes:                      Peak Codes:
   T - Thermal Neutron Activation      G - Gamma Ray
   F - Fast Neutron Activation         X - X-Ray
   I - Fission Product                 P - Positron Decay
   N - Naturally Occurring Isotope     S - Single-Escape
   P - Photon Reaction                 D - Double-Escape
   C - Charged Particle Reaction       K - Key Line
   M - No MDA Calculation              A - Not in Average
   R - Coincidence Corrected           C - Coincidence Peak
   H - Halflife limit exceeded

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
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***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	-1.8381E-02	-1.8853E-02	2.9031E-01	2.9031E-01	3.320E-01
K-40		1.2262E+01	1.2262E+01	1.6500E+00	1.7895E+00	
MN-54	#A	-2.1942E-03	-2.2037E-03	5.2671E-02	5.2671E-02	3.561E-02
CO-57	#B	-4.6625E-03	-4.6859E-03	3.7235E-02	3.7236E-02	4.154E-02
CO-60	#B	-1.3832E-03	-1.3841E-03	5.4294E-02	5.4294E-02	5.054E-02

Sr-85	#A	-1.7370E-02	-1.7736E-02	4.2277E-02	4.2289E-02	4.606E-02
Kr-85	#A	-4.2780E+02	-4.2781E+02	1.0836E+03	1.0839E+03	1.070E+03
Y-88	#B	0.0000E+00	0.0000E+00	9.4473E-03	9.4489E-03	2.292E-02
NB-94	#B	6.5197E-04	6.5197E-04	2.4822E-02	2.4822E-02	3.145E-02
Ag-108M	#B	7.1198E-03	7.1201E-03	3.6072E-02	3.6074E-02	4.218E-02
CD-109	#A	-4.3112E-02	-4.3241E-02	1.4062E+00	1.4062E+00	1.262E+00
SN-113	#B	1.2456E-03	1.2603E-03	4.8014E-02	4.8014E-02	5.514E-02
SB-125	#B	1.0115E-03	1.0129E-03	8.8325E-02	8.8325E-02	1.044E-01
I-131	#B	1.5090E-02	1.7853E-02	3.8274E-02	3.8288E-02	3.582E-02
CS-134	#B	-2.3430E-02	-2.3472E-02	5.3028E-02	5.3045E-02	5.529E-02
CS-137	#A	2.2049E-02	2.2051E-02	3.5522E-02	3.5544E-02	3.849E-02
CE-139	#A	3.1348E-03	3.1657E-03	3.1861E-02	3.1861E-02	3.570E-02
EU-152	#B	-1.5857E-02	-1.5862E-02	1.2650E-01	1.2650E-01	1.260E-01
EU-154	#B	-1.2494E-02	-1.2499E-02	7.4819E-02	7.4823E-02	7.408E-02
EU-155	#B	-2.5160E-03	-2.5179E-03	1.3754E-01	1.3754E-01	1.541E-01
HG-203	#B	-1.2322E-02	-1.2685E-02	3.8837E-02	3.8843E-02	4.215E-02
TL-208		1.9038E-01	1.9038E-01	8.3435E-02	8.4126E-02	
PB-212	#	3.2685E-01	3.2685E-01	9.7442E-02	9.9176E-02	9.033E-02
PB-214	#	2.9727E-01	2.9727E-01	8.7221E-02	8.8824E-02	8.246E-02
BI-212	#B	1.0603E-01	1.0603E-01	2.6752E-01	2.6758E-01	3.033E-01
BI-214	#	3.7595E-01	3.7595E-01	1.1564E-01	1.1757E-01	
RA-224	#A	9.1111E-01	9.1111E-01	9.5452E-01	9.5591E-01	1.023E+00
RA-226	#A	1.0306E+00	1.0306E+00	9.7629E-01	9.7803E-01	1.040E+00
AC-228		5.6871E-01	5.6871E-01	2.0180E-01	2.0434E-01	
TH-227	#B	-1.5581E-01	-1.5581E-01	3.5873E-01	3.5884E-01	3.872E-01
PA-234	#B	-1.1748E-03	-1.1748E-03	1.3206E-01	1.3206E-01	1.489E-01
TH-234	#B	7.3143E-01	7.3143E-01	7.5040E-01	7.5150E-01	1.861E+00
AM-241	#A	2.5845E-02	2.5845E-02	1.8038E-01	1.8038E-01	2.030E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (270.6 to 1999.1 keV) 1.3397087E+01 pCi/gm
Total Decayed Activity (270.6 to 1999.1 keV) 1.3397087E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JPK

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 101F_13SET2006_1339.An1

Sample description
FSS-OOL-05-09-020-F

Spectrum Filename: C:\GammaVision\Spectra\101F_13SET2006_1339.An1

Acquisition information

Start time:	13-Sep-2006 13:39:15
Live time:	2000
Real time:	2002
Dead time:	0.11 %
Detector ID:	1

Detector system
Det 101- DSPE-633

Calibration

Filename:	D1_1LSa.Clb

Detector 101 1.0 Liter Marinelli Sand

Energy Calibration

Created:	03-Sep-2004 08:50:48
Zero offset:	0.244 keV
Gain:	0.500 keV/channel
Quadratic:	-2.493E-08 keV/channel^2

Efficiency Calibration

Created:	03-Sep-2004 08:52:26
Type:	Polynomial
Uncertainty:	0.626 %
Coefficients:	-0.321775 -5.816463 0.734234
	-0.099357 0.006049 -0.000149

Library Files

Main analysis library:	FSS_Rev_1.Lib
Library Match Width:	1.000
Peak stripping:	Library based

Analysis parameters

Analysis engine:	Env32 G53W4.20
Start channel:	100 (50.23keV)
Stop channel:	4000 (1999.11keV)
Peak rejection level:	41.667%
Peak search sensitivity:	3
Sample Size:	1.8550E+03
Activity scaling factor:	1.0000E+06/(1.0000E+00* 1.8550E+03) = 5.3908E+02
Detection limit method:	Nureg 4.16
Random error:	1.0000000E+00
Systematic error:	1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	11-Sep-2006 14:54:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	101_150K_28APR05.Pbc 01-May-2005 05:24:47
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 15 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.1137

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
74.78	179.	23.21	1.50	1.654E-02				
74.78	179.	23.21	1.50	1.654E-02	74.81	9.600	8.217E-01	PB212
77.03	260.	15.70	1.50	1.720E-02	77.11	17.500	6.294E-01	PB212
					77.11	10.700	1.015E+00	PB214
77.03	256.	15.70	1.50	1.720E-02	77.11	17.500	6.204E-01	PB212
					77.11	10.700	1.015E+00	PB214
92.87	115.	33.76	1.27	1.990E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
185.84	106.	22.74	1.19	1.859E-02	185.99	3.280	1.271E+00	RA226
209.76	96.	30.38	1.20	1.719E-02				
238.73	605.	4.88	1.12	1.557E-02	238.63	43.100	6.502E-01	PB212
241.60	109.	20.16	1.12	1.541E-02	241.00	3.900	1.314E+00	RA224
270.10	53.	33.57	1.13	1.401E-02				
295.18	152.	14.79	1.15	1.292E-02				
295.18	152.	14.79	1.15	1.292E-02	295.22	19.200	4.411E-01	PB214
300.40	62.	30.05	1.46	1.271E-02				
338.27	119.	19.51	1.12	1.135E-02	338.40	12.010	6.243E-01	AC228
351.94	229.	9.55	1.14	1.093E-02				
351.94	229.	9.55	1.14	1.093E-02	351.99	37.100	4.080E-01	PB214
462.94	31.	40.76	1.50	8.342E-03	463.51	10.000	PBC<MDA	SB125
510.73	74.	20.51	1.76	7.590E-03	510.72	22.500	2.452E-01	TL208
583.13	180.	11.10	1.47	6.685E-03	583.14	86.000	2.248E-01	TL208
609.46	169.	13.11	1.54	6.411E-03	609.32	46.090	4.128E-01	BI214
727.36	70.	22.51	1.30	5.442E-03	727.17	11.800	7.886E-01	BI212
795.27	26.	32.21	1.50	5.016E-03	795.76	85.400	4.352E-02	CS134
860.70	33.	26.85	1.48	4.676E-03				
911.11	93.	14.20	1.05	4.446E-03	911.07	29.000	5.171E-01	AC228

969.19	104.	18.61	1.82	4.211E-03	968.90	17.460	1.021E+00	AC228
1120.41	41.	34.87	1.31	3.711E-03	1120.28	15.040	5.354E-01	BI214
1460.63	542.	4.45	1.77	2.943E-03	1460.75	10.700	1.250E+01	K40
1763.86	27.	19.25	1.50	2.481E-03	1764.51	15.920	4.898E-01	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
419.19	209.76	298.	96.	0.048	91.14	1.200	NP-239	s
477.17	238.79	133.	605.	0.303	14.64	1.122	PB-212	D
482.90	241.66	189.	109.	0.055	60.49	1.124	PB-214	D
539.93	270.10	128.	53.	0.027	100.71	1.125	AC-228	s
600.54	300.40	114.	62.	0.031	82.41	1.461	PB-212	s
1721.70	860.70	20.	33.	0.017	80.56	1.477	TL-208	

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
HG-203	145.87	73.15	910.	-122.	-0.061	108.57	1.499
PB-212	149.14	74.78	829.	179.	0.090	69.63	1.499
PB-212	153.79	77.11	704.	260.	0.130	47.11	1.499D
PB-214	153.79	77.11	708.	256.	0.128	47.11	1.499D
TH-234	185.45	92.93	724.	100.	0.050	111.00	1.499s
RA-226	371.33	185.84	228.	106.	0.053	68.23	1.187s
PB-212	477.26	238.78	376.	490.	0.245	21.24	1.499
RA-224	482.97	241.63	424.	93.	0.047	98.10	1.499s
PB-214	590.53	295.39	160.	133.	0.067	47.22	1.499s
AC-228	676.32	338.27	142.	117.	0.058	58.53	1.117
PB-214	703.70	351.95	92.	220.	0.110	27.10	1.499s
TL-208	1021.41	510.73	78.	57.	0.029	61.53	1.760s
TL-208	1166.26	583.13	71.	177.	0.089	33.29	1.474
BI-214	1218.95	609.46	88.	167.	0.084	39.32	1.543s
BI-212	1454.88	727.36	53.	70.	0.035	67.53	1.304
CS-134	1590.76	795.27	22.	26.	0.013	96.62	1.502
AC-228	1822.58	911.11	32.	92.	0.046	42.61	1.053s
AC-228	1938.80	969.19	62.	103.	0.052	55.82	1.816
BI-214	2241.41	1120.41	51.	41.	0.021	104.60	1.306
K-40	2922.27	1460.63	12.	540.	0.270	13.35	1.769
BI-214	3529.16	1763.86	0.	27.	0.013	57.74	1.499

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Code	MDA Value pCi/gm		COMMENTS
BE-7		0.0000E+00						
			477.56	0.000E+00	&(	4.434E-01	1.27E-01	G
K-40		1.2497E+01						
			1460.75	1.250E+01	(P	4.343E-01	5.59E-01	G
MN-54		1.8898E-02						
			834.81	1.890E-02	%(P	4.111E-02	1.24E-02	G
CO-57		1.1503E-02						
			122.07	1.150E-02	%(	4.373E-02	1.31E-02	G K
			136.43	1.053E-02	&	3.790E-01	1.12E-01	G
CO-60		5.2604E-04						
			1332.51	5.260E-04	%(P	5.071E-02	1.35E-02	G K
			1173.23	9.395E-03	% P	6.709E-02	1.92E-02	G K
Sr-85		-1.8867E-02						
			514.00	-1.887E-02	&(	5.608E-02	1.68E-02	G
Kr-85		-4.5301E+02						
			513.99	-4.530E+02	&(P	1.273E+03	3.79E+02	G
Y-88		8.7663E-04						
			1836.01	8.766E-04	&(	5.114E-02	1.31E-02	G K
			898.02	-1.567E-04	% P	4.379E-02	1.18E-02	G
NB-94		-8.3298E-03						
			871.10	-8.330E-03	&(P	5.004E-02	1.43E-02	G K
			702.50	-1.081E-02	% P	5.006E-02	1.46E-02	G K
Ag-108M		2.1363E-02						
			722.95	2.136E-02	%(	4.755E-02	1.44E-02	G K
			614.37	-1.749E-02	% P	5.644E-02	1.67E-02	G
			433.93	-1.717E-03	%	3.254E-02	9.21E-03	G
CD-109		-7.9016E-02						
			88.04	-7.902E-02	%(P	1.443E+00	4.30E-01	G
SN-113		-3.9027E-03						
			391.71	-3.903E-03	&(	6.323E-02	1.84E-02	G K
			255.04	-4.080E-01	% P	1.774E+00	5.28E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	4.6859E-02						
		427.95	4.686E-02	%(P	1.166E-01	3.50E-02	G K
		600.77	-4.690E-02	% P	2.561E-01	7.45E-02	G
		636.15	8.739E-02	& P	3.530E-01	1.03E-01	G
		463.51	2.670E-01	% P	3.656E-01	1.14E-01	G
		176.29	4.411E-02	% P	4.483E-01	1.32E-01	G
I-131	2.6240E-04						
		364.48	2.624E-04	&(	5.002E-02	1.44E-02	G K
		636.97	-1.071E-01	%	7.957E-01	2.30E-01	G
		284.29	1.996E-01	%	4.990E-01	1.50E-01	G
CS-134	2.1241E-02						
		604.66	1.749E-03	%(P	9.368E-02	2.75E-02	G K
		795.76	4.352E-02	(P	4.218E-02	1.42E-02	G
		569.29	-3.001E-02	% P	2.522E-01	7.19E-02	G
		801.84	-5.888E-02	%	4.433E-01	1.25E-01	G
CS-137	-1.2820E-03						
		661.62	-1.282E-03	%(P	6.697E-02	1.90E-02	G
CE-139	2.0016E-04						
		165.85	2.002E-04	%(P	4.587E-02	1.35E-02	G
EU-152	3.5569E-02						
		121.78	3.557E-02	%(P	1.297E-01	3.89E-02	G K
		344.30	-2.467E-03	% P	1.070E-01	3.04E-02	G
		1408.08	-3.589E-03	& P	2.101E-01	5.42E-02	G
		964.00	2.203E-01	% P	3.967E-01	1.22E-01	G
		1112.07	2.695E-02	% P	4.707E-01	1.32E-01	G
		778.90	-1.714E-02	% P	3.019E-01	8.35E-02	G
EU-154	2.6143E-02						
		123.10	2.614E-02	&(P	8.595E-02	2.58E-02	G K
		1274.80	3.079E-03	% P	1.621E-01	4.43E-02	G
		723.30	9.395E-02	% P	2.198E-01	6.60E-02	G
		1004.80	-3.512E-03	% P	2.950E-01	8.13E-02	G
EU-155	-8.6891E-03						
		86.45	-8.689E-03	%(	1.601E-01	4.77E-02	G K
		105.31	6.015E-02	%	1.871E-01	5.63E-02	G
HG-203	2.1141E-02						
		279.17	2.114E-02	&(	4.517E-02	1.37E-02	G K
		72.87	-7.331E-01	& P	1.182E+00	3.60E-01	G
		70.83	-1.715E+00	+	2.018E+00	6.21E-01	G
		82.50	-5.605E-01	%	2.323E+00	6.97E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	2.2905E-01						
		583.14	2.248E-01	(P	5.304E-02	2.53E-02	G
		510.72	2.452E-01	*(P	1.866E-01	6.43E-02	G
PB-212	5.6022E-01						
		238.63	5.321E-01	(P	1.010E-01	3.82E-02	G K
							Energy duplication
		77.11	6.294E-01	(	3.058E-01	9.88E-02	G
		74.81	8.217E-01	& P	6.279E-01	1.96E-01	G
PB-214	3.9379E-01						
		351.99	3.949E-01	@(P	8.503E-02	3.60E-02	G K
		295.22	3.916E-01	@(P	1.813E-01	6.25E-02	G
							Energy duplication
		77.11	1.015E+00	+ P	5.014E-01	1.62E-01	G
		241.92	-2.484E-01	% P	6.966E-01	2.10E-01	G
BI-212	7.8856E-01						
		727.17	7.886E-01	(P	4.173E-01	1.79E-01	G K
		1620.56	-1.443E-01	%	1.405E+00	3.65E-01	G
		785.42	-4.768E-01	& P	2.060E+00	5.92E-01	G
BI-214	4.5267E-01						
		609.32	4.128E-01	@(P	1.141E-01	5.45E-02	G K
		1764.51	4.898E-01	(P	1.359E-01	9.58E-02	G
		1120.28	5.354E-01	(P	4.697E-01	1.88E-01	G
RA-224	1.1255E+00						
		241.00	1.126E+00	(P	1.193E+00	3.71E-01	G
RA-226	1.2705E+00						
		185.99	1.271E+00	*(	8.728E-01	2.89E-01	G
AC-228	5.4850E-01						
		911.07	5.171E-01	(P	1.653E-01	7.50E-02	G K
		968.90	1.021E+00	+ P	3.901E-01	1.91E-01	G
		338.40	6.243E-01	(P	3.115E-01	1.24E-01	G
TH-227	-1.6753E-01						
		236.00	-1.675E-01	&(P	4.547E-01	1.37E-01	G K
		256.25	-1.554E-01	% P	5.292E-01	1.58E-01	G
PA-234	1.9716E-02						
		98.44	1.972E-02	%(	1.243E-01	3.69E-02	G K
		946.00	8.338E-02	%	2.323E-01	6.89E-02	G
		131.28	-1.687E-02	%	1.951E-01	5.80E-02	G
		94.67	-1.266E-01	%	3.190E-01	9.64E-02	G
		883.24	1.303E-03	&	3.809E-01	1.05E-01	G
		926.70	4.193E-02	&	3.564E-01	9.90E-02	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26-4.035E-02 %   3.722E-01 1.06E-01 G

TH-234       1.0330E+00
                           63.29 8.896E-01 %(P 2.024E+00 6.11E-01 G K
                           92.80 1.220E+00  (P 1.563E+00 4.79E-01 G
                           92.38 1.353E+00 % P 1.868E+00 5.70E-01 G

AM-241      -4.9602E-02
                           59.54-4.960E-02 &(P 2.809E-01 8.39E-02 G
```

(- This peak used in the nuclide activity average.

* - Peak is too wide, but only one peak in library.
! - Peak is part of a multiplet and this area went negative during deconvolution.
? - Peak is too narrow.
@ - Peak is too wide at FW25M, but ok at FWHM.
% - Peak fails sensitivity test.
$ - Peak identified, but first peak of this nuclide failed one or more qualification tests.
+ - Peak activity higher than counting uncertainty range.
- - Peak activity lower than counting uncertainty range.
= - Peak outside analysis energy range.
& - Calculated peak centroid is not close enough to the library energy centroid for positive identification.
P - Peakbackground subtraction
} - Peak is too close to another for the activity to be found directly.

Nuclide Codes:	Peak Codes:
T - Thermal Neutron Activation	G - Gamma Ray
F - Fast Neutron Activation	X - X-Ray
I - Fission Product	P - Positron Decay
N - Naturally Occurring Isotope	S - Single-Escape
P - Photon Reaction	D - Double-Escape
C - Charged Particle Reaction	K - Key Line
M - No MDA Calculation	A - Not in Average
R - Coincidence Corrected	C - Coincidence Peak
H - Halflife limit exceeded	

- -

***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	0.0000E+00	0.0000E+00	3.8163E-01	3.8163E-01	4.324E-01
K-40		1.2497E+01	1.2497E+01	1.6756E+00	1.8184E+00	
MN-54	#A	1.8816E-02	1.8898E-02	3.7202E-02	3.7217E-02	4.093E-02
CO-57	#B	1.1446E-02	1.1503E-02	3.9355E-02	3.9361E-02	4.352E-02
CO-60	#B	5.2567E-04	5.2604E-04	4.0615E-02	4.0615E-02	5.068E-02

Sr-85	#A	-1.8478E-02	-1.8867E-02	5.0309E-02	5.0320E-02	5.492E-02
Kr-85	#A	-4.5301E+02	-4.5301E+02	1.2784E+03	1.2787E+03	1.273E+03
Y-88	#B	8.6560E-04	8.7663E-04	3.9214E-02	3.9214E-02	5.050E-02
NB-94	#B	-8.3298E-03	-8.3298E-03	4.5185E-02	4.5187E-02	5.004E-02
Ag-108M	#B	2.1362E-02	2.1363E-02	4.3079E-02	4.3096E-02	4.755E-02
CD-109	#A	-7.8781E-02	-7.9016E-02	1.4536E+00	1.4536E+00	1.438E+00
SN-113	#B	-3.8572E-03	-3.9027E-03	5.5057E-02	5.5058E-02	6.249E-02
SB-125	#B	4.6796E-02	4.6859E-02	1.0499E-01	1.0502E-01	1.165E-01
I-131	#B	2.2183E-04	2.6240E-04	4.3093E-02	4.3093E-02	4.229E-02
CS-134	#B	2.1203E-02	2.1241E-02	2.0858E-02	2.0893E-02	9.352E-02
CS-137	#A	-1.2819E-03	-1.2820E-03	1.0097E-01	1.0097E-01	6.697E-02
CE-139	#A	1.9820E-04	2.0016E-04	4.0615E-02	4.0615E-02	4.542E-02
EU-152	#B	3.5559E-02	3.5569E-02	1.1674E-01	1.1676E-01	1.296E-01
EU-154	#B	2.6131E-02	2.6143E-02	7.7419E-02	7.7432E-02	8.591E-02
EU-155	#B	-8.6826E-03	-8.6891E-03	1.4322E-01	1.4322E-01	1.600E-01
HG-203	#B	2.0537E-02	2.1141E-02	4.1057E-02	4.1075E-02	4.388E-02
TL-208		2.2905E-01	2.2905E-01	7.7269E-02	7.8345E-02	
PB-212	#	5.6022E-01	5.6022E-01	1.2051E-01	1.2460E-01	1.010E-01
PB-214	#	3.9379E-01	3.9379E-01	1.0766E-01	1.0994E-01	8.503E-02
BI-212		7.8856E-01	7.8856E-01	5.3772E-01	5.3956E-01	
BI-214		4.5267E-01	4.5267E-01	1.7916E-01	1.8098E-01	
RA-224	#A	1.1255E+00	1.1255E+00	1.1126E+00	1.1145E+00	1.193E+00
RA-226	#	1.2705E+00	1.2705E+00	8.6685E-01	8.6982E-01	
AC-228		5.4850E-01	5.4850E-01	2.0239E-01	2.0475E-01	
TH-227	#B	-1.6753E-01	-1.6753E-01	4.2013E-01	4.2023E-01	4.547E-01
PA-234	#B	1.9716E-02	1.9716E-02	1.1077E-01	1.1078E-01	1.243E-01
TH-234	#B	1.0330E+00	1.0330E+00	1.2176E+00	1.2189E+00	2.024E+00
AM-241	#A	-4.9602E-02	-4.9602E-02	2.7385E-01	2.7386E-01	2.809E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (269.6 to 1999.1 keV) 1.5786693E+01 pCi/gm
Total Decayed Activity (269.6 to 1999.1 keV) 1.5786695E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JPK

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 102F_13SEPT2006_0946.An1

Sample description
FSS-OOL-05-09-004-F

Spectrum Filename: C:\GammaVision\Spectra\102F_13SEPT2006_0946.An1

Acquisition information

Start time:	13-Sep-2006 09:46:12
Live time:	2000
Real time:	2019
Dead time:	0.96 %
Detector ID:	3

Detector system
Det 102 - DSPP-468

Calibration
Filename: D2_1LSa.Clb
DET 102 1 Liter Sand Geometry

Energy Calibration

Created:	15-Jan-2005 03:09:29
Zero offset:	0.220 keV
Gain:	0.500 keV/channel
Quadratic:	-6.435E-08 keV/channel^2

Efficiency Calibration

Created:	15-Jan-2005 06:48:10
Type:	Polynomial
Uncertainty:	0.497 %
Coefficients:	-0.294180 -5.980622 0.744607
	-0.096737 0.005214 -0.000120

Library Files

Main analysis library:	FSS_Rev_1.Lib
Library Match Width:	1.000
Peak stripping:	Library based

Analysis parameters

Analysis engine:	Env32 G53W4.20
Start channel:	100 (50.22keV)
Stop channel:	4000 (1999.02keV)
Peak rejection level:	41.667%
Peak search sensitivity:	3
Sample Size:	1.7300E+03
Activity scaling factor:	1.0000E+06/(1.0000E+00* 1.7300E+03) = 5.7803E+02
Detection limit method:	Nureg 4.16
Random error:	1.0000000E+00
Systematic error:	1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	11-Sep-2006 14:06:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	102_150K_28APR05.Pbc 01-May-2005 05:27:47
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 11 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.7579

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
77.20	146.	27.53	1.50	9.541E-03	77.11	10.700	1.121E+00	PB214
					77.11	17.500	6.851E-01	PB212
77.20	146.	27.53	1.50	9.541E-03	77.11	10.700	1.121E+00	PB214
					77.11	17.500	6.851E-01	PB212
186.43	89.	31.14	1.20	1.625E-02	185.99	3.280	PBC<MDA	RA226
210.02	90.	31.90	1.94	1.516E-02				
238.90	607.	6.71	1.24	1.379E-02	238.63	43.100	7.974E-01	PB212
270.63	52.	36.77	1.43	1.241E-02				
295.73	117.	13.50	1.26	1.144E-02	295.22	19.200	4.137E-01	PB214
300.14	39.	33.24	1.26	1.129E-02				
338.92	133.	16.35	1.12	1.004E-02	338.40	12.010	8.586E-01	AC228
352.40	249.	11.54	1.41	9.668E-03	351.99	37.100	5.410E-01	PB214
409.73	34.	32.49	1.38	8.325E-03				
463.23	65.	22.41	1.42	7.369E-03				
463.23	65.	22.41	1.42	7.369E-03	463.51	10.000	6.717E-01	SB125
511.71	117.	18.43	1.35	6.682E-03	510.72	22.500	6.067E-01	TL208
583.94	177.	11.62	1.04	5.882E-03	583.14	86.000	2.717E-01	TL208
610.28	131.	13.20	1.63	5.641E-03	609.32	46.090	3.930E-01	BI214
662.22	25.	41.23	1.51	5.229E-03	661.62	84.620	PBC<MDA	CS137
728.57	33.	31.60	1.55	4.794E-03	727.17	11.800	4.525E-01	BI212
912.42	110.	14.71	1.60	3.917E-03	911.07	29.000	7.505E-01	AC228
970.15	87.	20.02	1.80	3.714E-03	968.90	17.460	1.044E+00	AC228
1462.70	493.	4.67	1.80	2.618E-03	1460.75	10.700	1.374E+01	K40
1766.51	23.	23.25	2.24	2.225E-03	1764.51	15.920	5.034E-01	BI214

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

Peak Centroid Channel	Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
419.66	210.02	272.	90.	0.045	95.71	1.943	NP-239	s

Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM	Suspected
477.42	238.90	773.	144.	0.072	85.46	1.238	PB-212
540.89	270.63	135.	52.	0.026	110.31	1.430	AC-228
600.12	300.23	80.	43.	0.022	99.40	1.157	PB-212
819.17	409.73	44.	34.	0.017	97.46	1.378	AC-228

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-214	153.80	77.11	739.	146.	0.073	82.59	1.500D
PB-212	153.80	77.11	739.	146.	0.073	82.59	1.500D
RA-226	371.91	186.15	331.	89.	0.044	87.69	1.500
PB-212	477.52	238.95	285.	411.	0.205	22.88	1.500
PB-214	590.92	295.63	106.	121.	0.060	45.27	1.500
AC-228	677.51	338.92	109.	133.	0.066	49.04	1.122s
PB-214	704.50	352.41	116.	196.	0.098	31.65	1.500s
SB-125	927.10	463.68	58.	40.	0.020	89.28	1.500s
TL-208	1022.30	511.26	90.	111.	0.056	58.02	1.348s
TL-208	1167.71	583.94	65.	176.	0.088	34.87	1.041
BI-214	1220.42	610.28	56.	131.	0.065	39.60	1.632s
CS-137	1324.34	662.22	41.	25.	0.013	123.69	1.509s
BI-212	1457.10	728.57	37.	33.	0.016	94.81	1.554s
AC-228	1824.97	912.42	41.	109.	0.055	44.12	1.596
AC-228	1940.51	970.15	51.	87.	0.043	60.05	1.796
K-40	2926.34	1462.71	2.	465.	0.232	13.96	2.042
BI-214	3534.49	1766.51	3.	23.	0.011	69.76	2.236s

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	Peak MDA Value pCi/gm	COMMENTS
BE-7		1.2830E-01					
			477.56	1.283E-01	%(	4.017E-01 1.19E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
K-40	1.2941E+01						
		1460.75	1.294E+01	(P	2.351E-01	6.02E-01	G
MN-54	-4.9182E-04						
		834.81	-4.918E-04	%(P	5.562E-02	1.53E-02	G
CO-57	-5.8003E-04						
		122.07	-5.800E-04	%(	5.735E-02	1.70E-02	G K
		136.43	-3.809E-02	&	4.556E-01	1.35E-01	G
CO-60	9.5045E-03						
		1332.51	9.505E-03	&(P	5.653E-02	1.57E-02	G K
		1173.23	-7.120E-03	&	7.067E-02	1.99E-02	G K
Sr-85	1.2570E-04						
		514.00	1.257E-04	&(	5.440E-02	1.55E-02	G
Kr-85	3.8628E+00						
		513.99	3.863E+00	&(	1.231E+03	3.51E+02	G
Y-88	-5.4397E-03						
		1836.01	-5.440E-03	%(P	4.846E-02	1.25E-02	G K
		898.02	-4.153E-03	% P	6.005E-02	1.65E-02	G
NB-94	1.4754E-02						
		871.10	1.475E-02	%(	4.914E-02	1.44E-02	G K
		702.50	5.543E-03	&	4.290E-02	1.21E-02	G K
Ag-108M	1.4935E-02						
		722.95	1.493E-02	&(	5.010E-02	1.47E-02	G K
		614.37	-5.662E-02	% P	8.429E-02	2.60E-02	G
		433.93	9.872E-03	&	4.007E-02	1.17E-02	G
CD-109	-2.3866E-01						
		88.04	-2.387E-01	%(P	2.329E+00	6.95E-01	G
SN-113	-1.6369E-02						
		391.71	-1.637E-02	&(	6.909E-02	2.04E-02	G K
		255.04	5.052E-01	%	1.856E+00	5.53E-01	G
SB-125	1.2039E-01						
		427.95	1.680E-02	%(P	1.251E-01	3.59E-02	G K
		600.77	5.724E-02	& P	2.395E-01	6.96E-02	G
		636.15	1.438E-01	& P	3.399E-01	1.02E-01	G
		463.51	4.270E-01	@(P	4.053E-01	1.32E-01	G
		176.29	1.044E-01	& P	5.537E-01	1.64E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
I-131	2.2188E-02						
		364.48	2.219E-02	%(	5.698E-02	1.71E-02	G K
		636.97	-2.025E-01	%	8.870E-01	2.59E-01	G
		284.29	-2.174E-02	%	6.875E-01	1.99E-01	G
CS-134	6.1682E-04						
		604.66	6.168E-04	%(	4.811E-02	1.35E-02	G K
		795.76	3.823E-02	%	6.399E-02	1.98E-02	G
		569.29	1.546E-02	%	3.010E-01	8.52E-02	G
		801.84	-1.283E-01	% P	6.538E-01	1.89E-01	G
CS-137	4.4375E-02						
		661.62	4.437E-02	*(	5.755E-02	1.83E-02	G
CE-139	-8.7226E-03						
		165.85	-8.723E-03	%(P	5.347E-02	1.59E-02	G
EU-152	1.4986E-02						
		121.78	1.499E-02	%(P	1.514E-01	4.49E-02	G K
		344.30	-1.127E-02	%	1.554E-01	4.51E-02	G
		1408.08	6.798E-02	%	2.494E-01	7.13E-02	G
		964.00	-8.813E-02	% P	4.902E-01	1.41E-01	G
		1112.07	-1.327E-03	%	5.870E-01	1.64E-01	G
		778.90	-2.472E-02	& P	4.006E-01	1.12E-01	G
EU-154	-4.4802E-02						
		123.10	-4.480E-02	%(P	1.243E-01	3.75E-02	G K
		1274.80	4.320E-02	%	1.897E-01	5.45E-02	G
		723.30	-1.581E-01	% P	3.413E-01	1.03E-01	G
		1004.80	-2.626E-03	%	2.796E-01	7.49E-02	G
EU-155	1.5634E-01						
		86.45	1.563E-01	%(P	2.554E-01	7.78E-02	G K
		105.31	1.440E-02	%	2.232E-01	6.61E-02	G
HG-203	-3.1230E-03						
		279.17	-3.123E-03	&(P	5.511E-02	1.61E-02	G K
		72.87	-6.081E-01	%	2.232E+00	6.72E-01	G
		70.83	9.087E-01	%	3.854E+00	1.16E+00	G
		82.50	-6.060E-01	%	4.245E+00	1.27E+00	G
TL-208	2.7171E-01						
		583.14	2.717E-01	(P	6.203E-02	3.17E-02	G
		510.72	5.761E-01	+	2.432E-01	1.11E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
PB-212	5.3924E-01						
		238.63	5.392E-01	(	1.069E-01	4.11E-02	G K
							Energy duplication
		77.11	6.851E-01	+	6.055E-01	1.89E-01	G
		74.81	8.320E-01	& P	1.253E+00	3.83E-01	G
PB-214	4.2638E-01						
		351.99	4.254E-01	@(P	1.151E-01	4.50E-02	G K
		295.22	4.283E-01	(	1.795E-01	6.46E-02	G
							Energy duplication
		77.11	1.121E+00	+	9.903E-01	3.08E-01	G
		241.92	3.531E-01	%	6.761E-01	2.06E-01	G
BI-212	4.5251E-01						
		727.17	4.525E-01	*(	4.301E-01	1.43E-01	G K
		1620.56	-1.487E-01	& P	2.293E+00	6.01E-01	G
		785.42	-8.637E-03	% P	2.613E+00	7.21E-01	G
BI-214	4.2135E-01						
		609.32	3.930E-01	(	1.127E-01	5.19E-02	G K
		1764.51	5.034E-01	&(P	2.325E-01	1.18E-01	G
		1120.28	2.878E-01	%	4.541E-01	1.42E-01	G
RA-224	7.4895E-01						
		241.00	7.490E-01	%(P	1.288E+00	3.93E-01	G
RA-226	1.3029E+00						
		185.99	1.303E+00	(P	1.281E+00	4.00E-01	G
AC-228	8.6035E-01						
		911.07	7.505E-01	(P	2.229E-01	1.11E-01	G K
		968.90	1.044E+00	(P	4.340E-01	2.09E-01	G
		338.40	8.586E-01	@(	3.324E-01	1.40E-01	G
TH-227	-8.8198E-02						
		236.00	-8.820E-02	%(P	4.606E-01	1.37E-01	G K
		256.25	-6.281E-03	&	5.741E-01	1.67E-01	G
PA-234	-3.8063E-02						
		98.44	-3.806E-02	%(	2.626E-01	7.84E-02	G K
		946.00	7.959E-03	%	2.575E-01	7.03E-02	G
		131.28	-7.508E-02	&	2.528E-01	7.60E-02	G
		94.67	-1.028E-01	&	4.758E-01	1.43E-01	G
		883.24	5.512E-03	&	3.527E-01	9.42E-02	G
		926.70	-8.457E-02	%	5.751E-01	1.64E-01	G
		569.26	2.286E-02	%	4.458E-01	1.26E-01	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments

TH-234       1.5321E-01
                           63.29 1.532E-01 %(P 5.023E+00 1.49E+00 G K
                                                          Energy duplication
                           92.80 1.244E+00 %   2.471E+00 7.50E-01 G
                           92.38-2.223E-01 % P 3.113E+00 9.28E-01 G

AM-241      -1.1927E-02
                           59.54-1.193E-02 %(  5.891E-01 1.74E-01 G
   ( - This peak used in the nuclide activity average.

   * - Peak is too wide, but only one peak in library.
   ! - Peak is part of a multiplet and this area went
       negative during deconvolution.
   ? - Peak is too narrow.
   @ - Peak is too wide at FW25M, but ok at FWHM.
   % - Peak fails sensitivity test.
   $ - Peak identified, but first peak of this nuclide
       failed one or more qualification tests.
   + - Peak activity higher than counting uncertainty range.
   - - Peak activity lower than counting uncertainty range.
   = - Peak outside analysis energy range.
   & - Calculated peak centroid is not close enough to the
       library energy centroid for positive identification.
   P - Peakbackground subtraction
   } - Peak is too close to another for the activity
       to be found directly.

   Nuclide Codes:                      Peak Codes:
   T - Thermal Neutron Activation      G - Gamma Ray
   F - Fast Neutron Activation         X - X-Ray
   I - Fission Product                 P - Positron Decay
   N - Naturally Occurring Isotope     S - Single-Escape
   P - Photon Reaction                 D - Double-Escape
   C - Charged Particle Reaction       K - Key Line
   M - No MDA Calculation              A - Not in Average
   R - Coincidence Corrected           C - Coincidence Peak
   H - Halflife limit exceeded

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
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***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	1.2531E-01	1.2830E-01	3.5699E-01	3.5706E-01	3.924E-01
K-40		1.2941E+01	1.2941E+01	1.8068E+00	1.9473E+00	2.351E-01
MN-54	#A	-4.8984E-04	-4.9182E-04	4.2153E-01	4.2153E-01	5.539E-02
CO-57	#B	-5.7733E-04	-5.8003E-04	5.0896E-02	5.0896E-02	5.708E-02
CO-60	#B	9.4983E-03	9.5045E-03	4.7174E-02	4.7177E-02	5.649E-02

Sr-85	#A	1.2328E-04	1.2570E-04	4.6566E-02	4.6566E-02	5.335E-02

Kr-85	#A	3.8627E+00	3.8628E+00	1.0543E+03	1.0543E+03	1.231E+03
Y-88	#B	-5.3757E-03	-5.4397E-03	3.7792E-02	3.7793E-02	4.789E-02
NB-94	#B	1.4754E-02	1.4754E-02	4.3074E-02	4.3082E-02	4.914E-02
Ag-108M	#B	1.4934E-02	1.4935E-02	4.4023E-02	4.4031E-02	5.010E-02
CD-109	#A	-2.3800E-01	-2.3866E-01	2.5697E+00	2.5697E+00	2.322E+00
SN-113	#B	-1.6191E-02	-1.6369E-02	6.1140E-02	6.1147E-02	6.833E-02
SB-125	#B	1.2024E-01	1.2039E-01	1.1162E-01	1.1182E-01	1.249E-01
I-131	#B	1.8967E-02	2.2188E-02	5.1310E-02	5.1325E-02	4.871E-02
CS-134	#B	6.1579E-04	6.1682E-04	4.0425E-02	4.0425E-02	4.803E-02
CS-137	#A	4.4369E-02	4.4375E-02	5.4888E-02	5.4944E-02	5.754E-02
CE-139	#A	-8.6430E-03	-8.7226E-03	5.0544E-02	5.0547E-02	5.299E-02
EU-152	#B	1.4982E-02	1.4986E-02	1.3467E-01	1.3467E-01	1.514E-01
EU-154	#B	-4.4784E-02	-4.4802E-02	1.1357E-01	1.1360E-01	1.243E-01
EU-155	#B	1.5623E-01	1.5634E-01	2.3341E-01	2.3357E-01	2.552E-01
HG-203	#B	-3.0396E-03	-3.1230E-03	5.0782E-02	5.0782E-02	5.364E-02
TL-208		2.7171E-01	2.7171E-01	9.4959E-02	9.6176E-02	
PB-212	#	5.3924E-01	5.3924E-01	1.2335E-01	1.2701E-01	1.069E-01
PB-214	#	4.2638E-01	4.2638E-01	1.1784E-01	1.2024E-01	1.151E-01
BI-212	#	4.5251E-01	4.5251E-01	4.2902E-01	4.2977E-01	4.301E-01
BI-214	#	4.2135E-01	4.2135E-01	1.6685E-01	1.6852E-01	
RA-224	#A	7.4895E-01	7.4895E-01	1.1781E+00	1.1789E+00	1.288E+00
RA-226	#	1.3029E+00	1.3029E+00	1.1998E+00	1.2021E+00	1.281E+00
AC-228		8.6035E-01	8.6035E-01	2.5600E-01	2.6052E-01	
TH-227	#B	-8.8198E-02	-8.8198E-02	4.2516E-01	4.2519E-01	4.606E-01
PA-234	#B	-3.8063E-02	-3.8063E-02	2.3527E-01	2.3528E-01	2.626E-01
TH-234	#B	1.5321E-01	1.5321E-01	4.4773E+00	4.4773E+00	5.023E+00
AM-241	#A	-1.1927E-02	-1.1927E-02	5.2166E-01	5.2166E-01	5.891E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (50.2 to 1999.0 keV) 1.4494603E+01 pCi/gm
Total Decayed Activity (50.2 to 1999.0 keV) 1.4494603E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JPK

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 102F_13SEPT2006_1027.An1

Sample description
FSS-OOL-05-09-013-F

Spectrum Filename: C:\GammaVision\Spectra\102F_13SEPT2006_1027.An1

Acquisition information

Start time:	13-Sep-2006 10:27:41
Live time:	2000
Real time:	2020
Dead time:	0.97 %
Detector ID:	3

Detector system
Det 102 - DSPP-468

Calibration
Filename: D2_1LSa.Clb
DET 102 1 Liter Sand Geometry

Energy Calibration

Created:	15-Jan-2005 03:09:29
Zero offset:	0.220 keV
Gain:	0.500 keV/channel
Quadratic:	-6.435E-08 keV/channel^2

Efficiency Calibration

Created:	15-Jan-2005 06:48:10
Type:	Polynomial
Uncertainty:	0.497 %
Coefficients:	-0.294180 -5.980622 0.744607
	-0.096737 0.005214 -0.000120

Library Files

Main analysis library:	FSS_Rev_1.Lib
Library Match Width:	1.000
Peak stripping:	Library based

Analysis parameters

Analysis engine:	Env32 G53W4.20
Start channel:	100 (50.22keV)
Stop channel:	4000 (1999.02keV)
Peak rejection level:	41.667%
Peak search sensitivity:	3
Sample Size:	1.9060E+03
Activity scaling factor:	1.0000E+06/(1.0000E+00* 1.9060E+03) = 5.2466E+02
Detection limit method:	Nureg 4.16
Random error:	1.0000000E+00
Systematic error:	1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	11-Sep-2006 14:41:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	102_150K_28APR05.Pbc 01-May-2005 05:27:47
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 12 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.6073

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
74.87	114.	36.86	1.50	8.847E-03	70.83	3.520	3.127E+00	HG203
					74.81	9.600	PBC<MDA	PB212
77.16	197.	21.50	1.50	9.541E-03	77.11	10.700	1.370E+00	PB214
					77.11	17.500	8.378E-01	PB212
77.16	197.	21.50	1.50	9.541E-03	77.11	10.700	1.370E+00	PB214
					77.11	17.500	8.378E-01	PB212
186.49	83.	29.97	1.30	1.624E-02	185.99	3.280	PBC<MDA	RA226
238.96	572.	6.82	1.27	1.379E-02	238.63	43.100	6.816E-01	PB212
242.05	74.	38.53	1.50	1.370E-02	241.00	3.900	PBC<MDA	RA224
					241.92	7.470	PBC<MDA	PB214
277.62	48.	31.33	1.24	1.212E-02				
277.62	48.	31.33	1.24	1.212E-02	279.17	81.500	PBC<MDA	HG203
295.70	169.	10.74	1.25	1.145E-02	295.22	19.200	5.457E-01	PB214
300.34	47.	31.90	1.26	1.128E-02				
328.22	43.	34.78	1.52	1.036E-02				
338.85	94.	25.84	1.34	1.005E-02	338.40	12.010	5.516E-01	AC228
352.46	282.	9.54	1.48	9.666E-03	351.99	37.100	5.564E-01	PB214
463.72	35.	36.60	1.50	7.365E-03	463.51	10.000	PBC<MDA	SB125
511.75	112.	15.74	1.22	6.682E-03	510.72	22.500	5.295E-01	TL208
583.94	160.	12.17	0.94	5.882E-03	583.14	86.000	2.231E-01	TL208
610.22	204.	8.32	1.66	5.641E-03	609.32	46.090	5.555E-01	BI214
727.82	44.	30.66	1.08	4.790E-03	727.17	11.800	5.515E-01	BI212
912.39	104.	13.90	1.45	3.917E-03	911.07	29.000	6.469E-01	AC228
969.91	82.	26.18	1.95	3.715E-03	968.90	17.460	8.974E-01	AC228
1122.34	35.	28.00	1.82	3.283E-03	1120.28	15.040	4.984E-01	BI214
1462.66	534.	4.39	1.71	2.618E-03	1460.75	10.700	1.348E+01	K40
1767.11	26.	19.61	1.54	2.222E-03				

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
477.54	238.96	731.	138.	0.069	87.20	1.271	PB-212	
554.89	277.91	90.	48.	0.024	93.98	1.242	NP-239	D
600.42	300.38	111.	42.	0.021	118.78	1.013	PB-212	s
656.11	328.22	80.	43.	0.021	104.33	1.523	AC-228	s
3535.86	1767.11	0.	26.	0.013	59.04	2.238	XE-138	D

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
HG-203	146.68	73.55	820.	-102.	-0.051	123.02	1.500s
PB-212	149.31	74.87	878.	114.	0.057	110.57	1.500
PB-214	153.80	77.11	801.	197.	0.099	64.49	1.500D
PB-212	153.80	77.11	801.	197.	0.099	64.49	1.500D
RA-226	372.36	186.38	368.	85.	0.042	95.95	1.500
PB-212	477.50	238.94	348.	360.	0.180	27.11	1.500
RA-224	483.74	242.05	378.	74.	0.037	115.60	1.500s
PB-214	590.98	295.66	160.	186.	0.093	36.20	1.500
AC-228	677.38	338.85	171.	94.	0.047	77.51	1.339
PB-214	704.56	352.44	112.	263.	0.131	25.14	1.500
SB-125	927.18	463.72	72.	35.	0.017	109.80	1.500s
TL-208	1023.28	511.75	58.	112.	0.056	47.23	1.223s
TL-208	1167.70	583.94	69.	159.	0.080	36.50	0.937s
BI-214	1220.29	610.22	35.	204.	0.102	24.96	1.657
Ag-108M	1224.65	612.40	144.	-49.	-0.024	112.83	1.499s
BI-212	1455.60	727.82	46.	44.	0.022	91.98	1.078
AC-228	1824.91	912.39	30.	104.	0.052	41.70	1.452
AC-228	1940.02	969.91	83.	82.	0.041	78.54	1.946s
BI-214	2245.08	1122.34	30.	35.	0.017	83.99	1.819s
K-40	2926.22	1462.66	8.	523.	0.262	13.44	1.709

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	Peak MDA Value pCi/gm	COMMENTS
BE-7		-7.6573E-02					
			477.56	-7.657E-02	%(	4.599E-01 1.34E-01	G
K-40		1.3232E+01					
			1460.75	1.323E+01	(P	3.944E-01 5.93E-01	G
MN-54		2.1508E-04					
			834.81	2.151E-04	%(P	4.606E-02 1.26E-02	G
CO-57		-2.2452E-03					
			122.07	-2.245E-03	%(	4.083E-02 1.20E-02	G K
			136.43	1.133E-01	%	4.022E-01 1.21E-01	G
CO-60		4.2276E-04					
			1332.51	4.228E-04	%(P	5.501E-02 1.47E-02	G K
			1173.23	-1.372E-02	%	7.691E-02 2.22E-02	G K
Sr-85		6.9548E-03					
			514.00	6.955E-03	&(	5.024E-02 1.46E-02	G
Kr-85		1.5746E+02					
			513.99	1.575E+02	&(	1.137E+03 3.31E+02	G
Y-88		-3.0632E-03					
			1836.01	-3.063E-03	%(P	3.556E-02 8.63E-03	G K
			898.02	4.638E-03	% P	6.379E-02 1.80E-02	G
NB-94		-4.6803E-03					
			871.10	-4.680E-03	%(	5.248E-02 1.48E-02	G K
			702.50	-2.633E-03	%	3.492E-02 9.62E-03	G K
Ag-108M		-6.3241E-03					
			722.95	-6.324E-03	%(	5.172E-02 1.47E-02	G K
			614.37	-6.855E-02	+ P	8.210E-02 2.57E-02	G
			433.93	1.448E-02	&	3.501E-02 1.05E-02	G
CD-109		7.3201E-01					
			88.04	7.320E-01	%(P	1.792E+00 5.41E-01	G
SN-113		-1.3725E-02					
			391.71	-1.372E-02	%(	7.140E-02 2.10E-02	G K
			255.04	4.495E-02	%	1.960E+00 5.74E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	7.6901E-02						
		427.95	-1.051E-02	%(P	1.216E-01	3.45E-02	G K
		600.77	4.852E-03	% P	2.340E-01	6.57E-02	G
		636.15	-6.537E-04	& P	3.763E-01	1.04E-01	G
		463.51	3.356E-01	(P	4.071E-01	1.28E-01	G
		176.29	1.881E-01	& P	5.959E-01	1.79E-01	G
I-131	0.0000E+00						
		364.48	0.000E+00	%(	4.904E-02	1.40E-02	G K
		636.97	0.000E+00	&	8.037E-01	2.27E-01	G
		284.29	-1.670E-01	&	8.053E-01	2.39E-01	G
CS-134	4.9532E-03						
		604.66	4.953E-03	%(	3.634E-02	1.03E-02	G K
		795.76	2.347E-02	%	5.851E-02	1.75E-02	G
		569.29	1.875E-02	&	2.528E-01	7.15E-02	G
		801.84	2.277E-02	& P	6.480E-01	1.83E-01	G
CS-137	1.9873E-02						
		661.62	1.987E-02	&(	3.986E-02	1.22E-02	G
CE-139	4.5465E-03						
		165.85	4.547E-03	%(P	5.159E-02	1.53E-02	G
EU-152	-2.8014E-03						
		121.78	-2.801E-03	%(P	1.637E-01	4.85E-02	G K
		344.30	-2.214E-02	%	1.542E-01	4.53E-02	G
		1408.08	1.033E-04	&	2.299E-01	5.96E-02	G
		964.00	-2.996E-03	& P	6.099E-01	1.74E-01	G
		1112.07	1.793E-01	%	4.447E-01	1.33E-01	G
		778.90	-5.095E-02	% P	3.559E-01	1.01E-01	G
EU-154	3.1640E-02						
		123.10	3.164E-02	%(P	1.130E-01	3.39E-02	G K
		1274.80	-2.007E-02	%	2.082E-01	5.88E-02	G
		723.30	-3.245E-02	% P	2.481E-01	7.06E-02	G
		1004.80	0.000E+00	&	3.316E-01	9.14E-02	G
EU-155	-2.8066E-02						
		86.45	-2.807E-02	%(P	2.474E-01	7.37E-02	G K
		105.31	6.987E-02	%	2.534E-01	7.61E-02	G
HG-203	2.7508E-03						
		279.17	2.751E-03	&(P	4.365E-02	1.27E-02	G K
		72.87	4.618E-02	%	1.900E+00	5.66E-01	G
		70.83	-2.787E+00	+	3.728E+00	1.14E+00	G
		82.50	-1.002E+00	%	4.075E+00	1.22E+00	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	2.2310E-01						
		583.14	2.231E-01	(P	5.782E-02	2.73E-02	G
		510.72	5.295E-01	+	1.791E-01	8.35E-02	G
PB-212	4.2858E-01						
		238.63	4.286E-01	(	1.069E-01	3.87E-02	G K
							Energy duplication
		77.11	8.378E-01	+	5.714E-01	1.80E-01	G
		74.81	9.535E-01	& P	1.175E+00	3.61E-01	G
PB-214	5.4680E-01						
		351.99	5.190E-01	(P	1.028E-01	4.36E-02	G K
		295.22	6.005E-01	(	1.985E-01	7.25E-02	G
							Energy duplication
		77.11	1.370E+00	+	9.346E-01	2.95E-01	G
		241.92	4.552E-01	&	6.671E-01	2.05E-01	G
BI-212	5.5146E-01						
		727.17	5.515E-01	(	4.301E-01	1.69E-01	G K
		1620.56	-2.690E-01	% P	2.095E+00	5.63E-01	G
		785.42	-1.208E-02	% P	2.706E+00	7.56E-01	G
BI-214	5.4145E-01						
		609.32	5.555E-01	(	8.245E-02	4.63E-02	G K
		1764.51	-1.734E-03	% P	3.356E-01	8.50E-02	G
		1120.28	4.984E-01	&(	4.046E-01	1.40E-01	G
RA-224	9.7638E-01						
		241.00	9.764E-01	(P	1.239E+00	3.82E-01	G
RA-226	1.1275E+00						
		185.99	1.128E+00	(P	1.224E+00	3.80E-01	G
AC-228	7.4103E-01						
		911.07	6.469E-01	(P	1.766E-01	9.02E-02	G K
		968.90	8.974E-01	@(P	4.928E-01	2.35E-01	G
		338.40	5.516E-01	-	3.735E-01	1.43E-01	G
TH-227	-1.4665E-01						
		236.00	-1.467E-01	%(P	4.539E-01	1.36E-01	G K
		256.25	9.190E-02	&	5.470E-01	1.62E-01	G
PA-234	-2.2909E-02						
		98.44	-2.291E-02	&(	2.563E-01	7.65E-02	G K
		946.00	3.206E-02	%	2.379E-01	6.68E-02	G
		131.28	1.052E-02	&	2.276E-01	6.75E-02	G
		94.67	-1.613E-01	%	4.615E-01	1.39E-01	G
		883.24	-4.029E-02	%	4.498E-01	1.27E-01	G
		926.70	9.505E-02	%	3.871E-01	1.11E-01	G

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 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26 2.122E-02 &   3.687E-01 1.04E-01 G

TH-234       3.0613E-01
                           63.29 3.061E-01 %(P 4.554E+00 1.36E+00 G K
                           92.80 1.719E+00 %   2.399E+00 7.35E-01 G
                           92.38 2.044E+00 & P 2.837E+00 8.68E-01 G

AM-241       6.4611E-02
                           59.54 6.461E-02 &(  6.623E-01 1.97E-01 G
   ( - This peak used in the nuclide activity average.

   * - Peak is too wide, but only one peak in library.
   ! - Peak is part of a multiplet and this area went
       negative during deconvolution.
   ? - Peak is too narrow.
   @ - Peak is too wide at FW25M, but ok at FWHM.
   % - Peak fails sensitivity test.
   $ - Peak identified, but first peak of this nuclide
       failed one or more qualification tests.
   + - Peak activity higher than counting uncertainty range.
   - - Peak activity lower than counting uncertainty range.
   = - Peak outside analysis energy range.
   & - Calculated peak centroid is not close enough to the
       library energy centroid for positive identification.
   P - Peakbackground subtraction
   } - Peak is too close to another for the activity
       to be found directly.

   Nuclide Codes:                      Peak Codes:
   T - Thermal Neutron Activation      G - Gamma Ray
   F - Fast Neutron Activation         X - X-Ray
   I - Fission Product                 P - Positron Decay
   N - Naturally Occurring Isotope     S - Single-Escape
   P - Photon Reaction                 D - Double-Escape
   C - Charged Particle Reaction       K - Key Line
   M - No MDA Calculation              A - Not in Average
   R - Coincidence Corrected           C - Coincidence Peak
   H - Halflife limit exceeded

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
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***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	-7.4782E-02	-7.6573E-02	4.0288E-01	4.0290E-01	4.491E-01
K-40		1.3232E+01	1.3232E+01	1.7784E+00	1.9272E+00	
MN-54	#A	2.1422E-04	2.1508E-04	3.7761E-02	3.7761E-02	4.588E-02
CO-57	#B	-2.2347E-03	-2.2452E-03	3.6088E-02	3.6088E-02	4.064E-02
CO-60	#B	4.2248E-04	4.2276E-04	4.3962E-02	4.3962E-02	5.497E-02

Sr-85	#A	6.8205E-03	6.9548E-03	4.3826E-02	4.3827E-02	4.927E-02
Kr-85	#A	1.5746E+02	1.5746E+02	9.9222E+02	9.9226E+02	1.137E+03
Y-88	#B	-3.0271E-03	-3.0632E-03	2.6274E-02	2.6274E-02	3.514E-02
NB-94	#B	-4.6803E-03	-4.6803E-03	4.4328E-02	4.4329E-02	5.248E-02
Ag-108M	#B	-6.3239E-03	-6.3241E-03	4.4135E-02	4.4136E-02	5.171E-02
CD-109	#A	7.2997E-01	7.3201E-01	1.6243E+00	1.6249E+00	1.787E+00
SN-113	#B	-1.3575E-02	-1.3725E-02	6.3107E-02	6.3112E-02	7.062E-02
SB-125	#B	7.6805E-02	7.6901E-02	8.8191E-02	8.8296E-02	1.215E-01
I-131	#B	0.0000E+00	0.0000E+00	4.1956E-02	4.1956E-02	4.191E-02
CS-134	#B	4.9449E-03	4.9532E-03	3.0864E-02	3.0865E-02	3.627E-02
CS-137	#A	1.9870E-02	1.9873E-02	3.6501E-02	3.6518E-02	3.986E-02
CE-139	#A	4.5049E-03	4.5465E-03	4.5900E-02	4.5900E-02	5.112E-02
EU-152	#B	-2.8006E-03	-2.8014E-03	3.8517E-01	3.8517E-01	1.637E-01
EU-154	#B	3.1627E-02	3.1640E-02	1.0173E-01	1.0175E-01	1.129E-01
EU-155	#B	-2.8046E-02	-2.8066E-02	3.6513E-01	3.6513E-01	2.472E-01
HG-203	#B	2.6771E-03	2.7508E-03	3.8152E-02	3.8153E-02	4.249E-02
TL-208		2.2310E-01	2.2310E-01	8.1644E-02	8.2598E-02	
PB-212	#	4.2858E-01	4.2858E-01	1.1618E-01	1.1865E-01	1.069E-01
PB-214	#	5.4680E-01	5.4680E-01	1.2056E-01	1.2441E-01	1.028E-01
BI-212		5.5146E-01	5.5146E-01	5.0724E-01	5.0819E-01	
BI-214		5.4145E-01	5.4145E-01	1.3513E-01	1.3850E-01	
RA-224	#A	9.7638E-01	9.7638E-01	1.1465E+00	1.1478E+00	1.239E+00
RA-226	#A	1.1275E+00	1.1275E+00	1.1387E+00	1.1405E+00	1.224E+00
AC-228		7.4103E-01	7.4103E-01	3.0971E-01	3.1249E-01	
TH-227	#B	-1.4665E-01	-1.4665E-01	4.1654E-01	4.1662E-01	4.539E-01
PA-234	#B	-2.2909E-02	-2.2909E-02	2.2938E-01	2.2939E-01	2.563E-01
TH-234	#B	3.0613E-01	3.0613E-01	4.0661E+00	4.0661E+00	4.554E+00
AM-241	#A	6.4610E-02	6.4611E-02	5.9187E-01	5.9188E-01	6.623E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (1766.8 to 1999.0 keV) 1.5289062E+01 pCi/gm
Total Decayed Activity (1766.8 to 1999.0 keV) 1.5289062E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JPK

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 102F_13SEPT2006_1107.An1

Sample description
FSS-OOL-05-09-019-F

Spectrum Filename: C:\GammaVision\Spectra\102F_13SEPT2006_1107.An1

Acquisition information

Start time:	13-Sep-2006 11:07:06
Live time:	2000
Real time:	2016
Dead time:	0.80 %
Detector ID:	3

Detector system
Det 102 - DSPP-468

Calibration
Filename: D2_1LSa.Clb
DET 102 1 Liter Sand Geometry

Energy Calibration

Created:	15-Jan-2005 03:09:29
Zero offset:	0.220 keV
Gain:	0.500 keV/channel
Quadratic:	-6.435E-08 keV/channel^2

Efficiency Calibration

Created:	15-Jan-2005 06:48:10
Type:	Polynomial
Uncertainty:	0.497 %
Coefficients:	-0.294180 -5.980622 0.744607
	-0.096737 0.005214 -0.000120

Library Files

Main analysis library:	FSS_Rev_1.Lib
Library Match Width:	1.000
Peak stripping:	Library based

Analysis parameters

Analysis engine:	Env32 G53W4.20
Start channel:	100 (50.22keV)
Stop channel:	4000 (1999.02keV)
Peak rejection level:	41.667%
Peak search sensitivity:	3
Sample Size:	2.0290E+03
Activity scaling factor:	1.0000E+06/(1.0000E+00* 2.0290E+03) = 4.9285E+02
Detection limit method:	Nureg 4.16
Random error:	1.0000000E+00
Systematic error:	1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	11-Sep-2006 14:45:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	102_150K_28APR05.Pbc 01-May-2005 05:27:47
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 8 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.6444

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
77.27	91.	39.14	1.50	9.541E-03	77.11	10.700	PBC<MDA	PB214
					77.11	17.500	3.611E-01	PB212
77.27	91.	39.14	1.50	9.541E-03	77.11	10.700	5.905E-01	PB214
					77.11	17.500	3.611E-01	PB212
186.29	84.	29.13	0.82	1.625E-02	185.99	3.280	9.991E-01	RA226
209.56	48.	38.38	0.80	1.518E-02				
238.97	285.	7.64	1.21	1.379E-02	238.63	43.100	3.188E-01	PB212
					241.00	3.900	3.536E+00	RA224
					241.92	7.470	1.860E+00	PB214
242.61	43.	34.75	1.22	1.363E-02				
295.74	101.	23.59	0.95	1.145E-02	295.22	19.200	3.050E-01	PB214
338.77	86.	22.42	1.27	1.005E-02	338.40	12.010	4.741E-01	AC228
352.47	155.	13.26	1.31	9.666E-03	351.99	37.100	2.866E-01	PB214
511.52	74.	18.08	1.67	6.685E-03	510.72	22.500	3.267E-01	TL208
583.89	100.	13.80	1.35	5.883E-03	583.14	86.000	1.315E-01	TL208
610.08	100.	13.07	1.20	5.643E-03	609.32	46.090	2.566E-01	BI214
912.07	53.	20.06	1.89	3.918E-03	911.07	29.000	3.084E-01	AC228
1121.92	39.	31.89	0.63	3.283E-03	1120.28	15.040	5.287E-01	BI214
1462.81	447.	4.76	1.76	2.618E-03	1460.75	10.700	1.062E+01	K40

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

Peak Centroid Channel	Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
418.73	209.56	126.	48.	0.024	115.13	0.798	AC-228	
477.57	238.89	94.	285.	0.142	22.92	1.215	PB-212	D

484.85	242.53	88.	43.	0.021	104.24	1.218	XE-138	D

Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM	Suspected	
677.21	338.77	124.	46.	0.023	111.64	1.267	AC-228	s

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-214	153.80	77.11	582.	91.	0.045	117.42	1.500D
PB-212	153.80	77.11	582.	91.	0.045	117.42	1.500D
RA-226	372.16	186.27	243.	64.	0.032	102.97	1.500s
PB-212	477.61	238.99	235.	254.	0.127	31.77	1.500
PB-214	477.60	238.99	128.	272.	0.136	25.31	1.500
PB-214	590.98	295.66	119.	80.	0.040	66.62	1.500s
AC-228	677.41	338.87	92.	42.	0.021	107.04	1.500s
PB-214	704.65	352.48	70.	130.	0.065	37.80	1.500
TL-208	1022.82	511.52	36.	74.	0.037	54.25	1.666s
TL-208	1167.62	583.89	29.	100.	0.050	41.39	1.347
BI-214	1220.01	610.08	25.	100.	0.050	39.22	1.202
AC-228	1824.70	912.28	22.	48.	0.024	59.75	1.679
BI-214	2244.24	1121.92	31.	39.	0.020	95.66	0.625s
K-40	2926.60	1462.85	2.	438.	0.219	14.40	2.042

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	Peak MDA Value pCi/gm	COMMENTS
BE-7		8.2891E-02					
			477.56	8.289E-02	%(	2.867E-01 8.41E-02	G
K-40		1.0397E+01					
			1460.75	1.040E+01	(P	2.235E-01 4.99E-01	G
MN-54		-4.6313E-03					
			834.81	-4.631E-03	%(P	4.320E-02 1.21E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CO-57	6.2850E-05						
		122.07	6.285E-05	%(	3.871E-02	1.14E-02	G K
		136.43	3.876E-03	%	3.545E-01	1.05E-01	G
CO-60	-6.9373E-03						
		1332.51	-6.937E-03	%(P	5.247E-02	1.45E-02	G K
		1173.23	1.040E-02	&	6.133E-02	1.75E-02	G K
Sr-85	-4.9373E-04						
		514.00	-4.937E-04	%(	3.245E-02	9.03E-03	G
Kr-85	-1.5181E+00						
		513.99	-1.518E+00	%(	8.065E+02	2.26E+02	G
Y-88	-8.0522E-05						
		1836.01	-8.052E-05	%(P	3.580E-02	8.27E-03	G K
		898.02	1.407E-02	% P	3.977E-02	1.16E-02	G
NB-94	-7.1168E-03						
		871.10	-7.117E-03	%(	4.475E-02	1.27E-02	G K
		702.50	7.314E-03	&	3.248E-02	9.29E-03	G K
Ag-108M	-4.4458E-03						
		722.95	-4.446E-03	&(	4.921E-02	1.39E-02	G K
		614.37	-1.055E-02	% P	4.569E-02	1.33E-02	G
		433.93	-9.463E-04	%	3.898E-02	1.11E-02	G
CD-109	6.5360E-01						
		88.04	6.536E-01	%(P	1.518E+00	4.59E-01	G
SN-113	-6.9716E-03						
		391.71	-6.972E-03	%(	4.316E-02	1.25E-02	G K
		255.04	-1.416E-02	%	1.547E+00	4.49E-01	G
SB-125	-7.9331E-03						
		427.95	-7.933E-03	%(P	1.045E-01	2.93E-02	G K
		600.77	5.157E-02	% P	1.296E-01	3.86E-02	G
		636.15	3.753E-02	% P	3.487E-01	9.89E-02	G
		463.51	1.500E-01	% P	2.886E-01	8.75E-02	G
		176.29	-9.733E-02	% P	4.765E-01	1.40E-01	G
I-131	1.0945E-03						
		364.48	1.094E-03	&(	5.009E-02	1.44E-02	G K
		636.97	0.000E+00	%	6.914E-01	1.94E-01	G
		284.29	1.000E-02	%	5.478E-01	1.58E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CS-134	-6.3224E-03						
		604.66	-6.322E-03	%(	3.413E-02	9.77E-03	G K
		795.76	-3.921E-03	%	4.294E-02	1.19E-02	G
		569.29	6.118E-02	%	2.293E-01	6.70E-02	G
		801.84	3.592E-02	& P	4.186E-01	1.15E-01	G
CS-137	-5.9846E-03						
		661.62	-5.985E-03	%(	4.643E-02	1.32E-02	G
CE-139	3.0955E-04						
		165.85	3.095E-04	&(P	3.676E-02	1.08E-02	G
EU-152	-1.7856E-03						
		121.78	-1.786E-03	%(P	1.069E-01	3.13E-02	G K
		344.30	-3.672E-02	%	1.304E-01	3.87E-02	G
		1408.08	-3.970E-02	%	2.312E-01	6.43E-02	G
		964.00	-6.246E-02	% P	4.015E-01	1.15E-01	G
		1112.07	-3.809E-02	%	3.869E-01	1.08E-01	G
		778.90	-8.861E-04	% P	3.092E-01	8.44E-02	G
EU-154	-1.2127E-02						
		123.10	-1.213E-02	%(P	8.614E-02	2.56E-02	G K
		1274.80	-9.516E-03	&	1.916E-01	5.35E-02	G
		723.30	-3.509E-02	& P	2.381E-01	6.81E-02	G
		1004.80	-8.055E-03	%	1.819E-01	4.75E-02	G
EU-155	6.5129E-02						
		86.45	6.513E-02	&(P	1.952E-01	5.87E-02	G K
		105.31	5.260E-02	%	1.965E-01	5.89E-02	G
HG-203	7.1972E-03						
		279.17	7.197E-03	%(P	4.126E-02	1.22E-02	G K
		72.87	-3.383E-01	&	1.620E+00	4.86E-01	G
		70.83	-6.394E-01	&	2.921E+00	8.75E-01	G
		82.50	-6.021E-01	%	3.009E+00	9.00E-01	G
TL-208	1.3148E-01						
		583.14	1.315E-01	(P	3.656E-02	1.82E-02	G
		510.72	3.267E-01	+	1.358E-01	5.92E-02	G
PB-212	3.0665E-01						
		238.63	2.846E-01	(	8.303E-02	3.01E-02	G K
							Energy duplication
		77.11	3.611E-01	@(	4.594E-01	1.41E-01	G
		74.81	4.402E-01	& P	9.320E-01	2.82E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
PB-214	2.4197E-01						
		351.99	2.413E-01	(P	7.748E-02	3.05E-02	G K
		295.22	2.433E-01	@(	1.621E-01	5.40E-02	G
							Energy duplication
		77.11	5.905E-01	+	7.513E-01	2.31E-01	G
		241.92	1.779E+00	+	3.619E-01	1.50E-01	G
BI-212	-3.1237E-02						
		727.17	-3.124E-02	%(	4.381E-01	1.25E-01	G K
		1620.56	-3.390E-02	% P	1.658E+00	4.12E-01	G
		785.42	-2.648E-03	% P	1.826E+00	4.92E-01	G
BI-214	2.5656E-01						
		609.32	2.566E-01	(	6.617E-02	3.36E-02	G K
		1764.51	-4.213E-02	% P	2.979E-01	7.95E-02	G
		1120.28	5.287E-01	+	3.854E-01	1.69E-01	G
RA-224	-1.1649E-01						
		241.00	-1.165E-01	&(P	9.439E-01	2.78E-01	G
RA-226	7.9401E-01						
		185.99	7.940E-01	@(P	9.413E-01	2.92E-01	G
AC-228	2.6752E-01						
		911.07	2.820E-01	(P	1.452E-01	5.64E-02	G K
		968.90	1.225E-01	% P	2.888E-01	8.68E-02	G
		338.40	2.325E-01	*(	2.616E-01	8.30E-02	G
TH-227	-4.2761E-02						
		236.00	-4.276E-02	&(P	3.421E-01	1.01E-01	G K
		256.25	-5.682E-02	&	4.674E-01	1.37E-01	G
PA-234	4.2750E-03						
		98.44	4.275E-03	%(	1.997E-01	5.92E-02	G K
		946.00	-2.893E-02	&	2.626E-01	7.42E-02	G
		131.28	1.544E-02	&	1.842E-01	5.46E-02	G
		94.67	1.023E-01	%	3.220E-01	9.68E-02	G
		883.24	-8.295E-02	%	3.920E-01	1.13E-01	G
		926.70	4.196E-02	&	3.437E-01	9.49E-02	G
		569.26	9.013E-02	%	3.397E-01	9.93E-02	G
TH-234	8.4882E-01						
		63.29	8.488E-01	%(P	3.538E+00	1.06E+00	G K
		92.80	4.591E-01	%	1.974E+00	5.92E-01	G
		92.38	5.433E-01	& P	2.325E+00	6.97E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
AM-241	4.6162E-02						
		59.54	4.616E-02	%(	4.976E-01	1.47E-01	G

(- This peak used in the nuclide activity average.

* - Peak is too wide, but only one peak in library.
! - Peak is part of a multiplet and this area went negative during deconvolution.
? - Peak is too narrow.
@ - Peak is too wide at FW25M, but ok at FWHM.
% - Peak fails sensitivity test.
$ - Peak identified, but first peak of this nuclide failed one or more qualification tests.
+ - Peak activity higher than counting uncertainty range.
- - Peak activity lower than counting uncertainty range.
= - Peak outside analysis energy range.
& - Calculated peak centroid is not close enough to the library energy centroid for positive identification.
P - Peakbackground subtraction
} - Peak is too close to another for the activity to be found directly.

Nuclide Codes:
T - Thermal Neutron Activation
F - Fast Neutron Activation
I - Fission Product
N - Naturally Occurring Isotope
P - Photon Reaction
C - Charged Particle Reaction
M - No MDA Calculation
R - Coincidence Corrected
H - Halflife limit exceeded

Peak Codes:
G - Gamma Ray
X - X-Ray
P - Positron Decay
S - Single-Escape
D - Double-Escape
K - Key Line
A - Not in Average
C - Coincidence Peak

- -

***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	8.0926E-02	8.2891E-02	2.5225E-01	2.5229E-01	2.799E-01
K-40		1.0397E+01	1.0397E+01	1.4975E+00	1.6071E+00	2.235E-01
MN-54	#A	-4.6123E-03	-4.6313E-03	4.1828E-02	4.1828E-02	4.302E-02
CO-57	#B	6.2553E-05	6.2850E-05	3.4101E-02	3.4101E-02	3.853E-02
CO-60	#B	-6.9327E-03	-6.9373E-03	4.5905E-02	4.5906E-02	5.243E-02
Sr-85	#A	-4.8407E-04	-4.9373E-04	2.7092E-02	2.7092E-02	3.182E-02
Kr-85	#A	-1.5181E+00	-1.5181E+00	6.7708E+02	6.7708E+02	8.065E+02
Y-88	#B	-7.9560E-05	-8.0522E-05	4.2015E-02	4.2015E-02	3.537E-02
NB-94	#B	-7.1168E-03	-7.1168E-03	3.8112E-02	3.8114E-02	4.475E-02
Ag-108M	#B	-4.4456E-03	-4.4458E-03	4.1769E-02	4.1770E-02	4.920E-02
CD-109	#A	6.5175E-01	6.5360E-01	1.3765E+00	1.3770E+00	1.514E+00

SN-113	#B	-6.8944E-03	-6.9716E-03	3.7351E-02	3.7353E-02	4.269E-02
SB-125	#B	-7.9230E-03	-7.9331E-03	1.8550E-01	1.8550E-01	1.043E-01
I-131	#B	9.3322E-04	1.0945E-03	4.3182E-02	4.3182E-02	4.271E-02
CS-134	#B	-6.3116E-03	-6.3224E-03	2.9300E-02	2.9303E-02	3.407E-02
CS-137	#A	-5.9839E-03	-5.9846E-03	3.9591E-02	3.9593E-02	4.642E-02
CE-139	#A	3.0668E-04	3.0955E-04	3.2259E-02	3.2259E-02	3.642E-02
EU-152	#B	-1.7851E-03	-1.7856E-03	4.6780E-01	4.6780E-01	1.069E-01
EU-154	#B	-1.2122E-02	-1.2127E-02	7.9256E-02	7.9258E-02	8.610E-02
EU-155	#B	6.5083E-02	6.5129E-02	1.7612E-01	1.7616E-01	1.951E-01
HG-203	#B	7.0019E-03	7.1972E-03	3.6470E-02	3.6472E-02	4.015E-02
TL-208		1.3148E-01	1.3148E-01	5.4646E-02	5.5142E-02	
PB-212	#	3.0665E-01	3.0665E-01	9.7415E-02	9.8923E-02	8.303E-02
PB-214	#	2.4197E-01	2.4197E-01	9.1728E-02	9.2728E-02	7.748E-02
BI-212	#B	-3.1237E-02	-3.1237E-02	3.7428E-01	3.7429E-01	4.381E-01
BI-214		2.5656E-01	2.5656E-01	1.0062E-01	1.0164E-01	
RA-224	#A	-1.1649E-01	-1.1649E-01	1.0699E+00	1.0699E+00	9.439E-01
RA-226	#A	7.9401E-01	7.9401E-01	8.7493E-01	8.7607E-01	9.413E-01
AC-228	#	2.6752E-01	2.6752E-01	1.6061E-01	1.6131E-01	1.452E-01
TH-227	#B	-4.2761E-02	-4.2761E-02	3.2126E-01	3.2126E-01	3.421E-01
PA-234	#B	4.2750E-03	4.2750E-03	1.7747E-01	1.7747E-01	1.997E-01
TH-234	#B	8.4882E-01	8.4882E-01	3.1766E+00	3.1770E+00	3.538E+00
AM-241	#A	4.6162E-02	4.6162E-02	4.4244E-01	4.4245E-01	4.976E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (295.7 to 1999.0 keV) 1.0784553E+01 pCi/gm
Total Decayed Activity (295.7 to 1999.0 keV) 1.0784553E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JPK

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 102F_13SEPT2006_1146.An1

Sample description
FSS-OOL-05-09-007-F

Spectrum Filename: C:\GammaVision\Spectra\102F_13SEPT2006_1146.An1

Acquisition information

Start time:	13-Sep-2006 11:46:33
Live time:	2000
Real time:	2021
Dead time:	1.05 %
Detector ID:	3

Detector system
Det 102 - DSPP-468

Calibration
Filename: D2_1LSa.Clb
DET 102 1 Liter Sand Geometry

Energy Calibration

Created:	15-Jan-2005 03:09:29
Zero offset:	0.220 keV
Gain:	0.500 keV/channel
Quadratic:	-6.435E-08 keV/channel^2

Efficiency Calibration

Created:	15-Jan-2005 06:48:10
Type:	Polynomial
Uncertainty:	0.497 %
Coefficients:	-0.294180 -5.980622 0.744607
	-0.096737 0.005214 -0.000120

Library Files

Main analysis library:	FSS_Rev_1.Lib
Library Match Width:	1.000
Peak stripping:	Library based

Analysis parameters

Analysis engine:	Env32 G53W4.20
Start channel:	100 (50.22keV)
Stop channel:	4000 (1999.02keV)
Peak rejection level:	41.667%
Peak search sensitivity:	3
Sample Size:	1.8490E+03
Activity scaling factor:	1.0000E+06/(1.0000E+00* 1.8490E+03) = 5.4083E+02
Detection limit method:	Nureg 4.16
Random error:	1.0000000E+00
Systematic error:	1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	11-Sep-2006 14:17:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	102_150K_28APR05.Pbc 01-May-2005 05:27:47
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 13 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.5401

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
74.86	108.	40.79	1.50	8.847E-03	74.81	9.600	PBC<MDA	PB212
77.10	239.	18.70	1.50	9.541E-03	77.11	10.700	1.713E+00	PB214
					77.11	17.500	1.047E+00	PB212
77.10	239.	18.70	1.50	9.541E-03	77.11	10.700	1.713E+00	PB214
					77.11	17.500	1.047E+00	PB212
87.19	95.	31.55	1.11	1.213E-02	86.45	32.740	PBC<MDA	EU155
93.26	113.	38.29	1.50	1.333E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	2.070E+00	TH234
					94.67	15.500	3.903E-01	PA234
93.28	119.	35.12	1.50	1.325E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
					94.67	15.500	PBC<MDA	PA234
186.17	87.	29.38	1.32	1.626E-02	185.99	3.280	PBC<MDA	RA226
209.60	61.	33.63	1.43	1.518E-02				
239.03	693.	4.45	1.22	1.379E-02	236.00	11.200	3.247E+00	TH227
					238.63	43.100	8.516E-01	PB212
242.13	116.	18.24	1.22	1.364E-02	241.00	3.900	1.569E+00	RA224
					241.92	7.470	8.297E-01	PB214
270.22	82.	25.20	0.95	1.243E-02				
295.25	149.	16.40	1.61	1.146E-02	295.22	19.200	4.954E-01	PB214
300.61	47.	33.03	1.14	1.127E-02				
328.33	68.	29.66	1.21	1.036E-02				
338.75	149.	18.98	1.49	1.005E-02	338.40	12.010	9.025E-01	AC228
352.46	272.	10.08	1.51	9.666E-03	351.99	37.100	5.538E-01	PB214
463.52	68.	19.68	1.74	7.365E-03	463.51	10.000	6.593E-01	SB125
511.71	100.	21.00	2.04	6.682E-03	510.72	22.500	4.862E-01	TL208
583.92	232.	8.93	1.60	5.882E-03	583.14	86.000	3.344E-01	TL208

610.29	192.	9.77	1.35	5.641E-03	609.32	46.090	5.401E-01	BI214
727.69	88.	19.28	2.22	4.791E-03	727.17	11.800	1.137E+00	BI212
787.08	22.	41.41	1.59	4.472E-03	785.42	2.000	PBC<MDA	BI212

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
912.46	116.	13.74	1.71	3.917E-03	911.07	29.000	7.452E-01	AC228
965.81	33.	29.06	1.71	3.734E-03	964.00	14.580	4.377E-01	EU152
970.18	129.	14.91	1.54	3.714E-03	968.90	17.460	1.453E+00	AC228
1121.02	42.	26.87	1.28	3.281E-03	1120.28	15.040	6.276E-01	BI214
1197.47	38.	33.05	0.65	3.102E-03				
1462.76	528.	4.35	2.12	2.618E-03	1460.75	10.700	1.376E+01	K40
1766.91	20.	31.55	2.24	2.225E-03	1764.51	15.920	4.032E-01	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
173.96	87.07	403.	95.	0.048	94.66	1.107	PB-214	lD
418.82	209.60	191.	61.	0.031	100.90	1.433	NP-239	
477.69	239.04	129.	693.	0.347	13.34	1.215	PB-212	D
483.88	242.14	165.	116.	0.058	54.73	1.217	PB-214	D
540.07	270.22	151.	82.	0.041	75.60	0.949	AC-228	s
600.87	300.61	97.	47.	0.023	99.09	1.143	PB-212	s
656.33	328.33	128.	68.	0.034	88.98	1.212	RH-106M	
2395.44	1197.47	42.	38.	0.019	99.16	0.650	-	sM

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.
M - Peak is close to a library peak.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-214	153.80	77.11	882.	239.	0.120	56.11	1.500D
PB-212	153.80	77.11	882.	239.	0.120	56.11	1.500D
TH-234	186.14	93.28	835.	119.	0.060	105.35	1.500s
TH-234	186.11	93.26	884.	113.	0.057	114.87	1.500s
RA-226	372.22	186.31	449.	86.	0.043	103.44	1.500
TH-227	477.70	239.04	193.	697.	0.349	14.15	1.500
PB-212	477.67	239.02	428.	609.	0.304	18.86	1.500
RA-224	483.47	241.92	452.	84.	0.042	110.73	1.500s
PB-214	591.08	295.71	197.	136.	0.068	50.82	1.500s
AC-228	677.18	338.75	198.	149.	0.075	56.94	1.491
PB-214	704.51	352.41	117.	226.	0.113	28.39	1.500
SB-125	926.85	463.55	60.	57.	0.029	67.68	1.500s
TL-208	1023.20	511.71	101.	100.	0.050	63.01	2.042s
TL-208	1167.67	583.92	60.	232.	0.116	26.78	1.597s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
BI-214	1220.43	610.29	58.	192.	0.096	29.32	1.346
BI-212	1455.34	727.69	54.	88.	0.044	57.83	2.219s
BI-212	1574.16	787.08	29.	22.	0.011	124.23	1.594s
AC-228	1825.05	912.46	41.	116.	0.058	41.22	1.707
EU-152	1931.83	965.81	29.	33.	0.016	87.19	1.714
AC-228	1940.57	970.18	59.	129.	0.065	44.73	1.541
BI-214	2242.43	1121.02	34.	42.	0.021	80.60	1.283
K-40	2926.62	1462.86	10.	500.	0.250	13.69	2.042
BI-214	3535.29	1766.91	9.	20.	0.010	94.64	2.237s

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	Peak MDA Value pCi/gm	COMMENTS
BE-7		2.4521E-02					
			477.56	2.452E-02	%(	3.291E-01 9.29E-02 G	
K-40		1.3032E+01					
			1460.75	1.303E+01	(P	4.616E-01 5.95E-01 G	
MN-54		-2.3533E-03					
			834.81	-2.353E-03	%(P	5.752E-02 1.61E-02 G	
CO-57		1.5674E-02					
			122.07	1.567E-02	%(	5.629E-02 1.69E-02 G K	
			136.43	1.009E-01	%	4.523E-01 1.35E-01 G	
CO-60		-8.0362E-03					
			1332.51	-8.036E-03	&(P	7.041E-02 1.97E-02 G K	
			1173.23	-9.347E-03	%	8.041E-02 2.30E-02 G K	
Sr-85		-4.4537E-03					
			514.00	-4.454E-03	&(	4.155E-02 1.19E-02 G	
Kr-85		-9.7986E+00					
			513.99	-9.799E+00	&(	1.273E+03 3.66E+02 G	
Y-88		-1.1313E-02					
			1836.01	-1.131E-02	%(P	6.818E-02 1.89E-02 G K	
			898.02	-5.036E-03	% P	6.325E-02 1.76E-02 G	

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
NB-94	1.1954E-04						
		871.10	1.195E-04	&(	5.138E-02	1.41E-02	G K
		702.50	7.192E-03	%	5.096E-02	1.46E-02	G K
Ag-108M	1.0255E-02						
		722.95	1.025E-02	%(	3.811E-02	1.10E-02	G K
		614.37	-3.686E-02	% P	7.623E-02	2.31E-02	G
		433.93	-6.404E-03	%	4.885E-02	1.42E-02	G
CD-109	9.9520E-03						
		88.04	9.952E-03	%(P	1.997E+00	5.93E-01	G
SN-113	-2.1040E-03						
		391.71	-2.104E-03	%(	5.391E-02	1.54E-02	G K
		255.04	-2.069E-01	%	1.978E+00	5.83E-01	G
SB-125	1.4469E-01						
		427.95	1.496E-03	&(P	1.572E-01	4.51E-02	G K
		600.77	5.604E-02	% P	2.380E-01	6.93E-02	G
		636.15	-6.583E-02	& P	4.778E-01	1.38E-01	G
		463.51	5.685E-01	*(P	3.857E-01	1.32E-01	G
		176.29	-1.098E-01	& P	7.089E-01	2.10E-01	G
I-131	5.6801E-04						
		364.48	5.680E-04	&(	5.701E-02	1.64E-02	G K
		636.97	9.527E-02	&	8.269E-01	2.37E-01	G
		284.29	-1.734E-01	%	8.917E-01	2.65E-01	G
CS-134	-1.4032E-03						
		604.66	-1.403E-03	%(	6.955E-02	2.01E-02	G K
		795.76	3.718E-02	%	6.719E-02	2.06E-02	G
		569.29	-2.695E-02	%	2.924E-01	8.36E-02	G
		801.84	-8.326E-02	% P	6.620E-01	1.89E-01	G
CS-137	1.6651E-02						
		661.62	1.665E-02	%(	5.624E-02	1.66E-02	G
CE-139	-1.0297E-02						
		165.85	-1.030E-02	%(P	6.023E-02	1.80E-02	G
EU-152	1.4434E-01						
		121.78	-1.923E-03	%(P	1.631E-01	4.82E-02	G K
		344.30	5.828E-03	%	1.643E-01	4.78E-02	G
		1408.08	-3.978E-03	%	2.150E-01	5.52E-02	G
		964.00	4.377E-01	(P	3.752E-01	1.28E-01	G
		1112.07	1.044E-01	%	4.963E-01	1.43E-01	G
		778.90	-4.281E-02	% P	3.663E-01	1.03E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
EU-154	3.0004E-02						
		123.10	3.000E-02	%(P	1.232E-01	3.69E-02	G K
		1274.80	-2.536E-02	&	1.961E-01	5.54E-02	G
		723.30	7.950E-02	% P	2.519E-01	7.43E-02	G
		1004.80	4.666E-02	%	3.504E-01	9.96E-02	G
EU-155	1.1699E-01						
		86.45	1.170E-01	%(P	2.745E-01	8.30E-02	G K
		105.31	6.316E-02	%	2.760E-01	8.28E-02	G
HG-203	-4.6108E-03						
		279.17	-4.611E-03	%(P	5.192E-02	1.52E-02	G K
		72.87	-2.355E-01	&	2.176E+00	6.51E-01	G
		70.83	-1.302E+00	&	4.056E+00	1.22E+00	G
		82.50	-8.528E-01	%	4.232E+00	1.27E+00	G
TL-208	3.3444E-01						
		583.14	3.344E-01	@(P	5.608E-02	2.99E-02	G
		510.72	4.862E-01	+	2.401E-01	1.02E-01	G
PB-212	7.4753E-01						
		238.63	7.475E-01	(	1.217E-01	4.70E-02	G K
							Energy duplication
		77.11	1.047E+00	+	6.175E-01	1.96E-01	G
		74.81	9.329E-01	& P	1.279E+00	3.91E-01	G
PB-214	4.5715E-01						
		351.99	4.602E-01	(P	1.080E-01	4.36E-02	G K
		295.22	4.512E-01	(	2.262E-01	7.64E-02	G
							Energy duplication
		77.11	1.713E+00	+	1.010E+00	3.20E-01	G
		241.92	5.086E-01	%	7.348E-01	2.25E-01	G
BI-212	1.2282E+00						
		727.17	1.137E+00	(	4.774E-01	2.19E-01	G K
		1620.56	-3.720E-02	& P	2.494E+00	6.59E-01	G
		785.42	1.767E+00	&(P	2.287E+00	7.33E-01	G
BI-214	5.6159E-01						
		609.32	5.401E-01	(	1.069E-01	5.29E-02	G K
		1764.51	4.032E-01	& P	3.514E-01	1.28E-01	G
		1120.28	6.276E-01	(	4.399E-01	1.69E-01	G
RA-224	1.1481E+00						
		241.00	1.148E+00	&(P	1.392E+00	4.30E-01	G
RA-226	1.1825E+00						
		185.99	1.182E+00	(P	1.390E+00	4.29E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
AC-228	7.9129E-01						
		911.07	7.452E-01	(P	2.092E-01	1.03E-01	G K
		968.90	1.453E+00	+ P	4.333E-01	2.17E-01	G
		338.40	9.025E-01	(	4.128E-01	1.72E-01	G
TH-227	3.2675E+00						
		236.00	3.268E+00	(P	3.160E-01	1.54E-01	G K
		256.25	9.289E-02	%	6.377E-01	1.89E-01	G
PA-234	-1.8700E-02						
		98.44	-1.870E-02	%(	2.842E-01	8.48E-02	G K
		946.00	3.076E-02	&	2.611E-01	7.34E-02	G
		131.28	1.490E-03	%	2.122E-01	6.27E-02	G
		94.67	0.000E+00	%	4.673E-01	1.39E-01	G
		883.24	-1.786E-02	&	4.961E-01	1.39E-01	G
		926.70	0.000E+00	%	6.031E-01	1.69E-01	G
		569.26	-4.469E-02	%	4.463E-01	1.28E-01	G
TH-234	1.8765E+00						
		63.29	1.278E+00	%(P	4.637E+00	1.39E+00	G K
		92.80	2.070E+00	&(	2.581E+00	7.92E-01	G
		92.38	2.559E+00	&(P	2.948E+00	9.07E-01	G
AM-241	5.4451E-03						
		59.54	5.445E-03	&(	6.905E-01	2.05E-01	G

(- This peak used in the nuclide activity average.

* - Peak is too wide, but only one peak in library.
! - Peak is part of a multiplet and this area went negative during deconvolution.
? - Peak is too narrow.
@ - Peak is too wide at FW25M, but ok at FWHM.
% - Peak fails sensitivity test.
$ - Peak identified, but first peak of this nuclide failed one or more qualification tests.
\+ - Peak activity higher than counting uncertainty range.
\- - Peak activity lower than counting uncertainty range.
= - Peak outside analysis energy range.
& - Calculated peak centroid is not close enough to the library energy centroid for positive identification.
P - Peakbackground subtraction
} - Peak is too close to another for the activity to be found directly.

Nuclide Codes:	Peak Codes:
T - Thermal Neutron Activation	G - Gamma Ray
F - Fast Neutron Activation	X - X-Ray

I - Fission Product
N - Naturally Occurring Isotope
P - Photon Reaction
C - Charged Particle Reaction
M - No MDA Calculation
R - Coincidence Corrected
H - Halflife limit exceeded

P - Positron Decay
S - Single-Escape
D - Double-Escape
K - Key Line
A - Not in Average
C - Coincidence Peak

- -

***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	2.3925E-02	2.4521E-02	2.7861E-01	2.7861E-01	3.211E-01
K-40		1.3032E+01	1.3032E+01	1.7840E+00	1.9281E+00	4.616E-01
MN-54	#A	-2.3434E-03	-2.3533E-03	6.6304E-02	6.6304E-02	5.728E-02
CO-57	#B	1.5598E-02	1.5674E-02	5.0703E-02	5.0710E-02	5.601E-02
CO-60	#B	-8.0307E-03	-8.0362E-03	6.2246E-02	6.2248E-02	7.036E-02
Sr-85	#A	-4.3644E-03	-4.4537E-03	3.5680E-02	3.5681E-02	4.071E-02
Kr-85	#A	-9.7985E+00	-9.7986E+00	1.0971E+03	1.0971E+03	1.273E+03
Y-88	#B	-1.1175E-02	-1.1313E-02	5.6933E-02	5.6937E-02	6.735E-02
NB-94	#B	1.1954E-04	1.1954E-04	4.2382E-02	4.2382E-02	5.138E-02
Ag-108M	#B	1.0255E-02	1.0255E-02	3.2997E-02	3.3002E-02	3.811E-02
CD-109	#A	9.9232E-03	9.9520E-03	1.7787E+00	1.7787E+00	1.991E+00
SN-113	#B	-2.0801E-03	-2.1040E-03	4.6086E-02	4.6086E-02	5.329E-02
SB-125	#B	1.4450E-01	1.4469E-01	1.0058E-01	1.0091E-01	1.570E-01
I-131	#B	4.8238E-04	5.6801E-04	4.9166E-02	4.9166E-02	4.841E-02
CS-134	#B	-1.4008E-03	-1.4032E-03	6.0208E-02	6.0208E-02	6.943E-02
CS-137	#A	1.6649E-02	1.6651E-02	4.9684E-02	4.9693E-02	5.623E-02
CE-139	#A	-1.0200E-02	-1.0297E-02	5.6471E-02	5.6474E-02	5.965E-02
EU-152	#B	1.4430E-01	1.4434E-01	1.2674E-01	1.2699E-01	1.630E-01
EU-154	#B	2.9992E-02	3.0004E-02	1.1084E-01	1.1085E-01	1.232E-01
EU-155	#B	1.1691E-01	1.1699E-01	2.4904E-01	2.4912E-01	2.743E-01
HG-203	#B	-4.4826E-03	-4.6108E-03	4.7147E-02	4.7147E-02	5.048E-02
TL-208	#	3.3444E-01	3.3444E-01	8.9710E-02	9.1653E-02	
PB-212	#	7.4753E-01	7.4753E-01	1.4098E-01	1.4709E-01	1.217E-01
PB-214	#	4.5715E-01	4.5715E-01	1.2999E-01	1.3250E-01	1.080E-01
BI-212		1.2282E+00	1.2282E+00	7.1034E-01	7.1367E-01	
BI-214		5.6159E-01	5.6159E-01	1.6468E-01	1.6767E-01	
RA-224	#A	1.1481E+00	1.1481E+00	1.2888E+00	1.2904E+00	1.392E+00
RA-226	#A	1.1825E+00	1.1825E+00	1.2863E+00	1.2880E+00	1.390E+00
AC-228		7.9129E-01	7.9129E-01	2.7831E-01	2.8183E-01	
TH-227	#	3.2675E+00	3.2675E+00	4.6260E-01	4.9761E-01	3.160E-01
PA-234	#B	-1.8700E-02	-1.8700E-02	2.5439E-01	2.5439E-01	2.842E-01
TH-234	#B	1.8765E+00	1.8765E+00	1.9964E+00	1.9991E+00	4.637E+00
AM-241	#A	5.4451E-03	5.4451E-03	6.1456E-01	6.1456E-01	6.905E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (270.2 to 1999.0 keV) 1.5947835E+01 pCi/gm
Total Decayed Activity (270.2 to 1999.0 keV) 1.5947835E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JPK

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 102F_13SEPT2006_1303.An1

Sample description
FSS-OOL-05-09-009-F

Spectrum Filename: C:\GammaVision\Spectra\102F_13SEPT2006_1303.An1

Acquisition information

Start time:	13-Sep-2006 13:03:45
Live time:	2000
Real time:	2019
Dead time:	0.93 %
Detector ID:	3

Detector system
Det 102 - DSPP-468

Calibration
Filename: D2_1LSa.Clb
DET 102 1 Liter Sand Geometry

Energy Calibration

Created:	15-Jan-2005 03:09:29
Zero offset:	0.220 keV
Gain:	0.500 keV/channel
Quadratic:	-6.435E-08 keV/channel^2

Efficiency Calibration

Created:	15-Jan-2005 06:48:10
Type:	Polynomial
Uncertainty:	0.497 %
Coefficients:	-0.294180 -5.980622 0.744607
	-0.096737 0.005214 -0.000120

Library Files

Main analysis library:	FSS_Rev_1.Lib
Library Match Width:	1.000
Peak stripping:	Library based

Analysis parameters

Analysis engine:	Env32 G53W4.20
Start channel:	100 (50.22keV)
Stop channel:	4000 (1999.02keV)
Peak rejection level:	41.667%
Peak search sensitivity:	3
Sample Size:	1.9000E+03
Activity scaling factor:	1.0000E+06/(1.0000E+00* 1.9000E+03) = 5.2632E+02
Detection limit method:	Nureg 4.16
Random error:	1.0000000E+00
Systematic error:	1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	11-Sep-2006 14:30:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	102_150K_28APR05.Pbc 01-May-2005 05:27:47
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 12 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.5925

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
75.15	100.	39.60	1.50	8.847E-03	74.81	9.600	PBC<MDA	PB212
77.17	102.	38.93	1.50	9.541E-03	77.11	10.700	PBC<MDA	PB214
					77.11	17.500	4.351E-01	PB212
77.17	102.	38.93	1.50	9.541E-03	77.11	10.700	7.116E-01	PB214
					77.11	17.500	4.351E-01	PB212
186.23	86.	35.96	0.92	1.626E-02	185.99	3.280	PBC<MDA	RA226
239.38	589.	6.30	1.19	1.377E-02	238.63	43.100	7.039E-01	PB212
270.93	63.	30.73	1.64	1.240E-02				
295.57	96.	21.23	1.42	1.145E-02	295.22	19.200	3.102E-01	PB214
329.51	58.	32.98	0.94	1.032E-02				
338.76	107.	16.64	1.30	1.005E-02	338.40	12.010	6.299E-01	AC228
352.62	168.	11.02	1.41	9.662E-03	351.99	37.100	3.312E-01	PB214
463.65	26.	38.23	1.50	7.365E-03				
463.65	26.	38.23	1.50	7.365E-03	463.51	10.000	PBC<MDA	SB125
511.22	92.	16.80	1.49	6.688E-03	510.72	22.500	4.334E-01	TL208
584.12	107.	16.00	1.49	5.881E-03	583.14	86.000	1.497E-01	TL208
610.10	103.	13.22	1.62	5.642E-03	609.32	46.090	2.814E-01	BI214
727.48	56.	27.43	1.12	4.792E-03	727.17	11.800	7.041E-01	BI212
912.36	121.	14.70	1.47	3.917E-03	911.07	29.000	7.540E-01	AC228
970.10	74.	17.73	0.76	3.714E-03	968.90	17.460	8.049E-01	AC228
1120.67	41.	39.73	1.18	3.283E-03	1120.28	15.040	5.906E-01	BI214
1462.88	496.	4.58	2.15	2.617E-03	1460.75	10.700	1.257E+01	K40
1766.92	17.	27.60	2.24	2.225E-03	1764.51	15.920	3.316E-01	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
372.06	186.23	325.	86.	0.043	107.88	0.919	PA-234	l
478.40	239.38	684.	144.	0.072	81.20	1.186	PB-212	s
541.50	270.93	122.	63.	0.032	92.19	1.644	AC-228	s
658.70	329.51	112.	58.	0.029	98.93	0.937	TH-227	s

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-212	149.88	75.15	781.	100.	0.050	118.81	1.500s
PB-214	153.80	77.11	739.	102.	0.051	116.79	1.500D
PB-212	153.80	77.11	739.	102.	0.051	116.79	1.500D
PB-212	477.62	238.99	317.	394.	0.197	24.39	1.500s
PB-214	590.91	295.63	158.	96.	0.048	63.47	1.500
AC-228	677.21	338.76	84.	107.	0.054	49.92	1.303s
PB-214	704.80	352.56	95.	171.	0.086	33.20	1.500s
SB-125	927.04	463.65	42.	26.	0.013	114.70	1.500
TL-208	1022.22	511.22	52.	92.	0.046	50.41	1.490s
TL-208	1168.07	584.12	62.	107.	0.053	47.99	1.486
BI-214	1220.05	610.10	33.	103.	0.052	39.67	1.618
BI-212	1455.30	727.67	46.	61.	0.030	79.48	1.129s
AC-228	1824.86	912.36	44.	121.	0.060	44.10	1.471
AC-228	1940.70	970.24	31.	66.	0.033	58.17	0.746s
BI-214	2241.73	1120.67	51.	41.	0.021	119.20	1.176s
K-40	2926.67	1462.88	9.	473.	0.236	14.05	2.042
BI-214	3535.30	1766.92	2.	17.	0.008	82.80	2.237s

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	MDA Value pCi/gm	COMMENTS
BE-7		1.7698E-01					
			477.56	1.770E-01	%(	3.721E-01 1.13E-01	G
K-40		1.1993E+01					
			1460.75	1.199E+01	(P	4.263E-01 5.62E-01	G
MN-54		-3.0479E-04					
			834.81	-3.048E-04	%(P	4.515E-02 1.23E-02	G
CO-57		1.2671E-02					
			122.07	1.267E-02	%(	5.068E-02 1.52E-02	G K
			136.43	1.445E-01	%	3.223E-01 9.75E-02	G
CO-60		-1.7971E-04					
			1332.51	-1.797E-04	%(P	5.394E-02 1.43E-02	G K
			1173.23	1.806E-02	%	7.106E-02 2.07E-02	G K
Sr-85		-1.5324E-02					
			514.00	-1.532E-02	%(	5.948E-02 1.76E-02	G
Kr-85		-3.4653E+02					
			513.99	-3.465E+02	%(	1.345E+03 3.99E+02	G
Y-88		1.1376E-02					
			1836.01	1.138E-02	%(P	3.496E-02 9.98E-03	G K
			898.02	-4.866E-03	% P	5.918E-02 1.65E-02	G
NB-94		-6.5197E-06					
			871.10	-6.520E-06	%(	5.444E-02 1.51E-02	G K
			702.50	-1.792E-03	&	4.095E-02 1.14E-02	G K
Ag-108M		-2.6767E-03					
			722.95	-2.677E-03	%(	5.643E-02 1.59E-02	G K
			614.37	-1.096E-02	% P	5.388E-02 1.57E-02	G
			433.93	-2.985E-04	&	4.099E-02 1.16E-02	G
CD-109		8.5491E-01					
			88.04	8.549E-01	&(P	1.848E+00 5.60E-01	G
SN-113		2.1997E-02					
			391.71	2.200E-02	%(	6.086E-02 1.82E-02	G K
			255.04	2.857E-01	&	1.787E+00 5.28E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	6.0362E-02						
		427.95	-3.018E-03	&(P	1.326E-01	3.75E-02	G K
		600.77	-3.225E-02	& P	2.623E-01	7.54E-02	G
		636.15	-1.795E-02	% P	4.077E-01	1.15E-01	G
		463.51	2.480E-01	(P	3.182E-01	1.01E-01	G
		176.29	-1.746E-02	& P	6.481E-01	1.90E-01	G
I-131	-3.9984E-03						
		364.48	-3.998E-03	%(	5.112E-02	1.48E-02	G K
		636.97	-2.800E-03	%	6.525E-01	1.81E-01	G
		284.29	-1.244E-02	%	7.612E-01	2.22E-01	G
CS-134	1.7138E-02						
		604.66	1.714E-02	%(	3.700E-02	1.12E-02	G K
		795.76	2.386E-02	%	4.800E-02	1.46E-02	G
		569.29	3.445E-02	&	2.800E-01	8.03E-02	G
		801.84	-1.926E-02	% P	4.772E-01	1.31E-01	G
CS-137	1.8513E-02						
		661.62	1.851E-02	%(	4.848E-02	1.45E-02	G
CE-139	-8.7398E-03						
		165.85	-8.740E-03	&(P	4.725E-02	1.41E-02	G
EU-152	-9.3461E-04						
		121.78	-9.346E-04	%(P	1.527E-01	4.51E-02	G K
		344.30	2.679E-02	&	1.280E-01	3.76E-02	G
		1408.08	-1.167E-02	&	2.660E-01	7.16E-02	G
		964.00	-7.309E-02	% P	3.885E-01	1.11E-01	G
		1112.07	-6.793E-02	&	4.935E-01	1.41E-01	G
		778.90	-1.930E-02	& P	3.652E-01	1.02E-01	G
EU-154	2.0654E-02						
		123.10	2.065E-02	%(P	1.061E-01	3.17E-02	G K
		1274.80	-4.164E-02	&	2.215E-01	6.39E-02	G
		723.30	-1.850E-02	& P	2.637E-01	7.45E-02	G
		1004.80	-4.895E-03	&	3.193E-01	8.80E-02	G
EU-155	-2.2364E-02						
		86.45	-2.236E-02	%(P	2.471E-01	7.35E-02	G K
		105.31	5.654E-02	%	2.453E-01	7.35E-02	G
HG-203	1.1881E-02						
		279.17	1.188E-02	&(P	4.296E-02	1.28E-02	G K
		72.87	-1.479E-02	&	2.054E+00	6.12E-01	G
		70.83	-3.724E-01	%	3.309E+00	9.87E-01	G
		82.50	-3.647E-01	&	3.906E+00	1.17E+00	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	1.4967E-01						
		583.14	1.497E-01	(P	5.549E-02	2.41E-02	G
		510.72	4.334E-01	+	1.718E-01	7.29E-02	G
PB-212	4.6103E-01						
		238.63	4.716E-01	@(	1.024E-01	3.83E-02	G K
							Energy duplication
		77.11	4.351E-01	@(	5.513E-01	1.69E-01	G
		74.81	8.356E-01	& P	1.113E+00	3.41E-01	G
PB-214	3.2932E-01						
		351.99	3.391E-01	@(P	9.527E-02	3.76E-02	G K
		295.22	3.103E-01	(	1.983E-01	6.57E-02	G
							Energy duplication
		77.11	7.116E-01	+	9.017E-01	2.77E-01	G
		241.92	2.725E-01	%	6.360E-01	1.92E-01	G
BI-212	7.6442E-01						
		727.17	7.644E-01	@(	4.323E-01	2.02E-01	G K
		1620.56	-3.623E-02	& P	2.091E+00	5.39E-01	G
		785.42	-6.581E-01	% P	2.972E+00	8.67E-01	G
BI-214	2.9426E-01						
		609.32	2.814E-01	(	8.053E-02	3.72E-02	G K
		1764.51	3.316E-01	?(P	1.959E-01	9.20E-02	G
		1120.28	5.906E-01	+	5.184E-01	2.35E-01	G
RA-224	6.5899E-01						
		241.00	6.590E-01	&(P	1.196E+00	3.64E-01	G
RA-226	6.9494E-01						
		185.99	6.949E-01	%(P	1.205E+00	3.66E-01	G
AC-228	7.1982E-01						
		911.07	7.540E-01	(P	2.112E-01	1.11E-01	G K
		968.90	7.249E-01	(P	3.132E-01	1.40E-01	G
		338.40	6.299E-01	@(	2.674E-01	1.05E-01	G
TH-227	-1.4364E-01						
		236.00	-1.436E-01	%(P	4.412E-01	1.33E-01	G K
		256.25	1.687E-01	%	5.265E-01	1.58E-01	G
PA-234	-2.0073E-02						
		98.44	-2.007E-02	%(	2.277E-01	6.78E-02	G K
		946.00	5.556E-02	%	2.016E-01	5.81E-02	G
		131.28	-1.532E-02	%	1.566E-01	4.62E-02	G
		94.67	-6.251E-02	&	4.341E-01	1.30E-01	G
		883.24	-8.387E-02	%	3.959E-01	1.14E-01	G
		926.70	-1.075E-02	%	4.848E-01	1.34E-01	G

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 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26 5.102E-02 &   4.147E-01 1.19E-01 G

TH-234       1.9913E+00
                           63.29 1.991E+00 %(P 4.081E+00 1.24E+00 G K
                           92.80 1.458E+00 %   2.234E+00 6.83E-01 G
                           92.38 1.637E+00 % P 2.651E+00 8.09E-01 G

AM-241       2.0348E-01
                           59.54 2.035E-01 &(  5.924E-01 1.78E-01 G
   ( - This peak used in the nuclide activity average.

   * - Peak is too wide, but only one peak in library.
   ! - Peak is part of a multiplet and this area went
       negative during deconvolution.
   ? - Peak is too narrow.
   @ - Peak is too wide at FW25M, but ok at FWHM.
   % - Peak fails sensitivity test.
   $ - Peak identified, but first peak of this nuclide
       failed one or more qualification tests.
   + - Peak activity higher than counting uncertainty range.
   - - Peak activity lower than counting uncertainty range.
   = - Peak outside analysis energy range.
   & - Calculated peak centroid is not close enough to the
       library energy centroid for positive identification.
   P - Peakbackground subtraction
   } - Peak is too close to another for the activity
       to be found directly.

   Nuclide Codes:                      Peak Codes:
   T - Thermal Neutron Activation      G - Gamma Ray
   F - Fast Neutron Activation         X - X-Ray
   I - Fission Product                 P - Positron Decay
   N - Naturally Occurring Isotope     S - Single-Escape
   P - Photon Reaction                 D - Double-Escape
   C - Charged Particle Reaction       K - Key Line
   M - No MDA Calculation              A - Not in Average
   R - Coincidence Corrected           C - Coincidence Peak
   H - Halflife limit exceeded

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
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***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	1.7258E-01	1.7698E-01	3.3854E-01	3.3868E-01	3.629E-01
K-40		1.1993E+01	1.1993E+01	1.6860E+00	1.8154E+00	4.263E-01
MN-54	#A	-3.0348E-04	-3.0479E-04	4.4396E-01	4.4396E-01	4.496E-02
CO-57	#B	1.2608E-02	1.2671E-02	4.5539E-02	4.5545E-02	5.043E-02
CO-60	#B	-1.7958E-04	-1.7971E-04	1.0244E+00	1.0244E+00	5.390E-02

Sr-85	#A	-1.5010E-02	-1.5324E-02	5.2895E-02	5.2902E-02	5.826E-02
Kr-85	#A	-3.4653E+02	-3.4653E+02	1.1961E+03	1.1962E+03	1.345E+03
Y-88	#B	1.1233E-02	1.1376E-02	2.9954E-02	2.9961E-02	3.452E-02
NB-94	#B	-6.5197E-06	-6.5197E-06	4.5265E-02	4.5265E-02	5.444E-02
Ag-108M	#B	-2.6766E-03	-2.6767E-03	4.7763E-02	4.7763E-02	5.643E-02
CD-109	#A	8.5238E-01	8.5491E-01	1.6795E+00	1.6802E+00	1.843E+00
SN-113	#B	2.1741E-02	2.1997E-02	5.4618E-02	5.4632E-02	6.015E-02
SB-125	#B	6.0282E-02	6.0362E-02	7.3414E-02	7.3492E-02	1.324E-01
I-131	#B	-3.3826E-03	-3.9984E-03	4.4264E-02	4.4264E-02	4.325E-02
CS-134	#B	1.7107E-02	1.7138E-02	3.3608E-02	3.3622E-02	3.694E-02
CS-137	#A	1.8511E-02	1.8513E-02	4.3378E-02	4.3391E-02	4.847E-02
CE-139	#A	-8.6548E-03	-8.7398E-03	4.4454E-02	4.4457E-02	4.679E-02
EU-152	#B	-9.3434E-04	-9.3461E-04	8.9076E-01	8.9076E-01	1.526E-01
EU-154	#B	2.0645E-02	2.0654E-02	9.5011E-02	9.5018E-02	1.060E-01
EU-155	#B	-2.2348E-02	-2.2364E-02	4.1817E-01	4.1817E-01	2.469E-01
HG-203	#B	1.1543E-02	1.1881E-02	3.8322E-02	3.8328E-02	4.174E-02
TL-208		1.4967E-01	1.4967E-01	7.2104E-02	7.2591E-02	
PB-212	#	4.6103E-01	4.6103E-01	1.1243E-01	1.1536E-01	1.024E-01
PB-214	#	3.2932E-01	3.2932E-01	1.0957E-01	1.1112E-01	9.527E-02
BI-212	#	7.6442E-01	7.6442E-01	6.0756E-01	6.0907E-01	
BI-214		2.9426E-01	2.9426E-01	1.1673E-01	1.1789E-01	
RA-224	#A	6.5899E-01	6.5899E-01	1.0922E+00	1.0928E+00	1.196E+00
RA-226	#A	6.9494E-01	6.9494E-01	1.0995E+00	1.1002E+00	1.205E+00
AC-228		7.1982E-01	7.1982E-01	2.1233E-01	2.1614E-01	
TH-227	#B	-1.4364E-01	-1.4364E-01	4.0502E-01	4.0510E-01	4.412E-01
PA-234	#B	-2.0073E-02	-2.0073E-02	2.0334E-01	2.0334E-01	2.277E-01
TH-234	#B	1.9913E+00	1.9913E+00	3.7143E+00	3.7160E+00	4.081E+00
AM-241	#A	2.0348E-01	2.0348E-01	5.3512E-01	5.3524E-01	5.924E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (50.2 to 1999.0 keV) 1.3920861E+01 pCi/gm
Total Decayed Activity (50.2 to 1999.0 keV) 1.3920861E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JPK

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 102F_13SEPT2006_1344.An1

Sample description
FSS-OOL-05-09-016-F

Spectrum Filename: C:\GammaVision\Spectra\102F_13SEPT2006_1344.An1

Acquisition information
Start time: 13-Sep-2006 13:44:33
Live time: 2000
Real time: 2015
Dead time: 0.74 %
Detector ID: 3

Detector system
Det 102 - DSPP-468

Calibration
Filename: D2_1LSa.Clb
DET 102 1 Liter Sand Geometry

Energy Calibration
Created: 15-Jan-2005 03:09:29
Zero offset: 0.220 keV
Gain: 0.500 keV/channel
Quadratic: -6.435E-08 keV/channel^2

Efficiency Calibration
Created: 15-Jan-2005 06:48:10
Type: Polynomial
Uncertainty: 0.497 %
Coefficients: -0.294180 -5.980622 0.744607
-0.096737 0.005214 -0.000120

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.22keV)
Stop channel: 4000 (1999.02keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 1.7800E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.7800E+03) =
5.6180E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	11-Sep-2006 14:55:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	102_150K_28APR05.Pbc 01-May-2005 05:27:47
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 10 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.5301

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
75.86	169.	21.41	1.00	9.168E-03	74.81	9.600	1.484E+00	PB212
					77.11	10.700	1.257E+00	PB214
					77.11	17.500	7.684E-01	PB212
185.66	77.	36.41	1.09	1.628E-02				
185.66	77.	36.41	1.09	1.628E-02	185.99	3.280	PBC<MDA	RA226
239.04	249.	8.35	1.22	1.379E-02	238.63	43.100	3.173E-01	PB212
239.02	241.	9.08	1.50	1.365E-02	238.63	43.100	PBC<MDA	PB212
241.79	44.	40.28	1.22	1.366E-02	241.00	3.900	PBC<MDA	RA224
295.10	102.	17.52	1.41	1.147E-02				
295.10	102.	17.52	1.41	1.147E-02	295.22	19.200	3.511E-01	PB214
300.65	34.	34.48	0.77	1.127E-02				
338.76	49.	23.00	1.11	1.005E-02	338.40	12.010	3.079E-01	AC228
352.28	139.	14.90	1.38	9.671E-03	351.99	37.100	2.926E-01	PB214
463.42	18.	41.57	1.50	7.365E-03	463.51	10.000	PBC<MDA	SB125
511.68	30.	35.84	1.50	6.695E-03	510.72	22.500	PBC<MDA	TL208
583.92	86.	15.51	1.46	5.882E-03	583.14	86.000	1.277E-01	TL208
610.06	122.	13.06	1.50	5.643E-03	609.32	46.090	3.557E-01	BI214
912.41	62.	21.76	1.99	3.917E-03	911.07	29.000	4.123E-01	AC228
969.79	56.	16.56	1.88	3.718E-03	968.90	17.460	6.545E-01	AC228
1121.23	26.	32.61	0.64	3.283E-03	1120.28	15.040	3.998E-01	BI214
1462.85	361.	5.26	2.10	2.618E-03	1460.75	10.700	9.769E+00	K40

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide

151.30	75.86	456.	169.	0.084	64.23	1.000	PB-214	l
370.93	185.66	243.	77.	0.038	109.24	1.095	U-235	l

Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM	Suspected	
477.70	238.93	91.	249.	0.124	25.06	1.215	PB-212	D
483.21	241.68	136.	44.	0.022	120.85	1.217	PB-214	D
600.97	300.65	51.	34.	0.017	101.59	0.768	PB-212	s
2926.60	1462.85	4.	357.	0.178	16.08	2.098	K-40	M

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.
M - Peak is close to a library peak.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-212	477.64	239.01	216.	226.	0.113	34.10	1.500
PB-214	477.66	239.02	119.	241.	0.121	27.24	1.500
PB-214	590.96	295.65	91.	78.	0.039	62.29	1.500s
AC-228	677.20	338.76	39.	49.	0.024	69.00	1.113
PB-214	704.74	352.53	72.	125.	0.062	39.30	1.500s
TL-208	1023.14	511.68	43.	30.	0.015	107.52	1.499s
TL-208	1167.91	584.04	29.	75.	0.037	45.90	1.499
BI-214	1219.97	610.06	33.	122.	0.061	39.19	1.496s
AC-228	1824.96	912.41	30.	62.	0.031	65.28	1.987
AC-228	1939.79	969.79	10.	56.	0.028	49.68	1.880
BI-214	2242.86	1121.23	17.	26.	0.013	97.84	0.641s

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	Peak MDA Value pCi/gm	COMMENTS
BE-7		9.7032E-02					
			477.56	9.703E-02	&(	2.760E-01 8.16E-02	G
K-40		1.1371E-01					
			1460.75	1.137E-01	%(P	4.175E-01 1.18E-01	G
MN-54		1.4631E-03					
			834.81	1.463E-03	%(P	5.588E-02 1.55E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CO-57	6.1056E-03						
		122.07	6.106E-03	&(	4.472E-02	1.33E-02	G K
		136.43	0.000E+00	&	3.632E-01	1.07E-01	G
CO-60	-2.0571E-04						
		1332.51	-2.057E-04	%(P	5.801E-02	1.54E-02	G K
		1173.23	-4.709E-04	%	5.395E-02	1.44E-02	G K
Sr-85	-2.9220E-03						
		514.00	-2.922E-03	&(	4.442E-02	1.27E-02	G
Kr-85	-6.5927E+01						
		513.99	-6.593E+01	&(	1.004E+03	2.86E+02	G
Y-88	-2.3640E-05						
		1836.01	-2.364E-05	&(P	6.062E-02	1.54E-02	G K
		898.02	-6.187E-03	% P	4.441E-02	1.20E-02	G
NB-94	1.1730E-02						
		871.10	1.173E-02	%(	4.668E-02	1.35E-02	G K
		702.50	-1.179E-02	%	4.720E-02	1.37E-02	G K
Ag-108M	-5.6849E-03						
		722.95	-5.685E-03	%(	4.916E-02	1.39E-02	G K
		614.37	-1.228E-02	% P	5.434E-02	1.58E-02	G
		433.93	-8.823E-03	%	3.640E-02	1.06E-02	G
CD-109	9.5165E-01						
		88.04	9.516E-01	&(P	1.831E+00	5.56E-01	G
SN-113	-1.0128E-02						
		391.71	-1.013E-02	%(	5.130E-02	1.49E-02	G K
		255.04	-1.561E-01	&	1.678E+00	4.90E-01	G
SB-125	2.8063E-02						
		427.95	2.806E-02	%(P	1.026E-01	2.99E-02	G K
		600.77	9.886E-03	% P	1.846E-01	5.07E-02	G
		636.15	2.457E-02	% P	2.559E-01	6.95E-02	G
		463.51	1.840E-01	% P	2.650E-01	8.31E-02	G
		176.29	-2.349E-02	% P	5.207E-01	1.51E-01	G
I-131	0.0000E+00						
		364.48	0.000E+00	%(	4.927E-02	1.40E-02	G K
		636.97	0.000E+00	%	6.501E-01	1.79E-01	G
		284.29	1.329E-02	%	6.972E-01	2.02E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CS-134	-1.9949E-03						
		604.66	-1.995E-03	%(	3.930E-02	1.09E-02	G K
		795.76	1.340E-04	%	4.687E-02	1.26E-02	G
		569.29	-1.789E-02	&	1.993E-01	5.51E-02	G
		801.84	8.552E-02	% P	4.297E-01	1.21E-01	G
CS-137	1.7264E-04						
		661.62	1.726E-04	&(	4.336E-02	1.18E-02	G
CE-139	-1.4537E-03						
		165.85	-1.454E-03	%(P	4.305E-02	1.26E-02	G
EU-152	1.2244E-02						
		121.78	1.224E-02	&(P	1.203E-01	3.55E-02	G K
		344.30	8.758E-03	%	1.171E-01	3.36E-02	G
		1408.08	-3.038E-02	%	2.154E-01	5.80E-02	G
		964.00	-5.418E-02	& P	3.803E-01	1.07E-01	G
		1112.07	1.268E-01	%	4.351E-01	1.27E-01	G
		778.90	-2.685E-02	% P	3.364E-01	9.31E-02	G
EU-154	7.6972E-04						
		123.10	7.697E-04	&(P	7.101E-02	2.06E-02	G K
		1274.80	-1.701E-02	&	1.966E-01	5.48E-02	G
		723.30	-2.887E-02	% P	2.240E-01	6.29E-02	G
		1004.80	-7.996E-03	%	2.406E-01	6.39E-02	G
EU-155	1.0218E-01						
		86.45	1.022E-01	%(P	2.209E-01	6.68E-02	G K
		105.31	4.415E-02	%	2.333E-01	6.97E-02	G
HG-203	6.6793E-03						
		279.17	6.679E-03	%(P	3.880E-02	1.14E-02	G K
		72.87	-3.083E-01	&	1.895E+00	5.67E-01	G
		70.83	-2.012E-01	%	3.080E+00	9.14E-01	G
		82.50	-2.352E-02	&	3.502E+00	1.04E+00	G
TL-208	1.2041E-01						
		583.14	1.122E-01	(P	4.174E-02	1.73E-02	G
		510.72	1.517E-01	(	1.679E-01	5.44E-02	G
PB-212	2.8809E-01						
		238.63	2.881E-01	(	9.091E-02	3.27E-02	G K
							Energy duplication
		77.11	3.326E-01	%	5.096E-01	1.56E-01	G
		74.81	6.163E-01	% P	1.048E+00	3.19E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
PB-214	2.6488E-01						
		351.99	2.632E-01	(P	8.920E-02	3.46E-02	G K
		295.22	2.680E-01	*(	1.629E-01	5.57E-02	G
							Energy duplication
		77.11	5.440E-01	%	8.334E-01	2.55E-01	G
		241.92	1.795E+00	&	3.990E-01	1.63E-01	G
BI-212	2.0922E-01						
		727.17	2.092E-01	%(	3.016E-01	9.64E-02	G K
		1620.56	-5.357E-03	% P	1.622E+00	3.91E-01	G
		785.42	-4.411E-01	% P	2.533E+00	7.25E-01	G
BI-214	3.6655E-01						
		609.32	3.557E-01	(	8.595E-02	4.65E-02	G K
		1764.51	-8.110E-02	% P	3.920E-01	1.09E-01	G
		1120.28	3.998E-01	(	3.371E-01	1.30E-01	G
RA-224	4.3780E-01						
		241.00	4.378E-01	%(P	1.038E+00	3.13E-01	G
RA-226	5.9879E-01						
		185.99	5.988E-01	%(P	1.053E+00	3.20E-01	G
AC-228	5.0334E-01						
		911.07	4.123E-01	(P	1.891E-01	9.02E-02	G K
		968.90	6.545E-01	(P	2.043E-01	1.09E-01	G
		338.40	3.079E-01	-	1.999E-01	7.09E-02	G
TH-227	-9.7188E-02						
		236.00	-9.719E-02	&(P	3.820E-01	1.14E-01	G K
		256.25	0.000E+00	%	5.903E-01	1.72E-01	G
PA-234	-2.9124E-02						
		98.44	-2.912E-02	&(	2.275E-01	6.78E-02	G K
		946.00	5.528E-02	&	2.293E-01	6.57E-02	G
		131.28	4.769E-03	%	1.943E-01	5.72E-02	G
		94.67	-5.870E-02	&	3.908E-01	1.17E-01	G
		883.24	-8.687E-02	%	4.154E-01	1.19E-01	G
		926.70	-1.433E-02	%	4.558E-01	1.25E-01	G
		569.26	-2.659E-02	&	2.951E-01	8.16E-02	G
TH-234	5.2735E-01						
		63.29	5.273E-01	&(P	4.302E+00	1.28E+00	G K
		92.80	9.632E-01	%	2.168E+00	6.56E-01	G
		92.38	-5.111E-01	% P	2.513E+00	7.51E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
AM-241	-6.0729E-03						
		59.54	-6.073E-03	&(	6.132E-01	1.81E-01	G

(- This peak used in the nuclide activity average.

* - Peak is too wide, but only one peak in library.
! - Peak is part of a multiplet and this area went negative during deconvolution.
? - Peak is too narrow.
@ - Peak is too wide at FW25M, but ok at FWHM.
% - Peak fails sensitivity test.
$ - Peak identified, but first peak of this nuclide failed one or more qualification tests.
+ - Peak activity higher than counting uncertainty range.
- - Peak activity lower than counting uncertainty range.
= - Peak outside analysis energy range.
& - Calculated peak centroid is not close enough to the library energy centroid for positive identification.
P - Peakbackground subtraction
} - Peak is too close to another for the activity to be found directly.

Nuclide Codes:
T - Thermal Neutron Activation
F - Fast Neutron Activation
I - Fission Product
N - Naturally Occurring Isotope
P - Photon Reaction
C - Charged Particle Reaction
M - No MDA Calculation
R - Coincidence Corrected
H - Halflife limit exceeded

Peak Codes:
G - Gamma Ray
X - X-Ray
P - Positron Decay
S - Single-Escape
D - Double-Escape
K - Key Line
A - Not in Average
C - Coincidence Peak

- -

***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	9.4606E-02	9.7032E-02	2.4486E-01	2.4492E-01	2.691E-01
K-40	A	1.1371E-01	1.1371E-01	3.5334E-01	3.5340E-01	4.175E-01
MN-54	#A	1.4567E-03	1.4631E-03	4.6621E-02	4.6621E-02	5.564E-02
CO-57	#B	6.0751E-03	6.1056E-03	3.9771E-02	3.9773E-02	4.449E-02
CO-60	#B	-2.0557E-04	-2.0571E-04	6.7147E+00	6.7147E+00	5.797E-02
Sr-85	#A	-2.8617E-03	-2.9220E-03	3.7955E-02	3.7955E-02	4.350E-02
Kr-85	#A	-6.5926E+01	-6.5927E+01	8.5808E+02	8.5809E+02	1.004E+03
Y-88	#B	-2.3342E-05	-2.3640E-05	6.0751E-04	6.0751E-04	5.985E-02
NB-94	#B	1.1730E-02	1.1730E-02	4.0416E-02	4.0421E-02	4.668E-02
Ag-108M	#B	-5.6848E-03	-5.6849E-03	4.1550E-02	4.1552E-02	4.916E-02
CD-109	#A	9.4881E-01	9.5165E-01	1.6684E+00	1.6693E+00	1.826E+00

SN-113	#B	-1.0010E-02	-1.0128E-02	4.4736E-02	4.4740E-02	5.070E-02
SB-125	#B	2.8025E-02	2.8063E-02	8.9557E-02	8.9571E-02	1.024E-01
I-131	#B	0.0000E+00	0.0000E+00	4.1939E-02	4.1939E-02	4.164E-02
CS-134	#B	-1.9913E-03	-1.9949E-03	3.2781E-02	3.2782E-02	3.923E-02
CS-137	#A	1.7262E-04	1.7264E-04	3.5283E-02	3.5283E-02	4.336E-02
CE-139	#A	-1.4395E-03	-1.4537E-03	5.3283E-02	5.3283E-02	4.263E-02
EU-152	#B	1.2240E-02	1.2244E-02	1.0639E-01	1.0640E-01	1.202E-01
EU-154	#B	7.6939E-04	7.6972E-04	6.1947E-02	6.1947E-02	7.097E-02
EU-155	#B	1.0211E-01	1.0218E-01	2.0052E-01	2.0060E-01	2.208E-01
HG-203	#B	6.4882E-03	6.6793E-03	3.4061E-02	3.4063E-02	3.769E-02
TL-208	#	1.2041E-01	1.2041E-01	5.5570E-02	5.5979E-02	4.174E-02
PB-212	#	2.8809E-01	2.8809E-01	9.8225E-02	9.9547E-02	9.091E-02
PB-214	#	2.6488E-01	2.6488E-01	9.7627E-02	9.8752E-02	8.920E-02
BI-212	#B	2.0922E-01	2.0922E-01	2.8908E-01	2.8932E-01	3.016E-01
BI-214		3.6655E-01	3.6655E-01	1.4365E-01	1.4512E-01	
RA-224	#A	4.3780E-01	4.3780E-01	9.3916E-01	9.3949E-01	1.038E+00
RA-226	#A	5.9879E-01	5.9879E-01	9.6034E-01	9.6093E-01	1.053E+00
AC-228		5.0334E-01	5.0334E-01	2.0698E-01	2.0890E-01	
TH-227	#B	-9.7188E-02	-9.7188E-02	3.5169E-01	3.5174E-01	3.820E-01
PA-234	#B	-2.9124E-02	-2.9124E-02	2.0332E-01	2.0332E-01	2.275E-01
TH-234	#B	5.2735E-01	5.2735E-01	3.8418E+00	3.8419E+00	4.302E+00
AM-241	#A	-6.0729E-03	-6.0729E-03	5.4367E-01	5.4367E-01	6.132E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (294.7 to 1999.0 keV) 8.6989737E-01 pCi/gm
Total Decayed Activity (294.7 to 1999.0 keV) 8.6989737E-01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JPK

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 103F_11SEPT2006_1558.An1

Sample description
OOL-05-09-013-F-S WET

Spectrum Filename: C:\GammaVision\Spectra\103F_11SEPT2006_1558.An1

Acquisition information
Start time: 11-Sep-2006 15:59:24
Live time: 2000
Real time: 2002
Dead time: 0.10 %
Detector ID: 4

Detector system
Det 103 - DSPE-471

Calibration
Filename: D3_1LSa.Clb
Detector_103 1.0 Liter Sand Geometry

Energy Calibration
Created: 08-Aug-2005 11:09:41
Zero offset: 0.409 keV
Gain: 0.500 keV/channel
Quadratic: 1.092E-08 keV/channel^2

Efficiency Calibration
Created: 08-Aug-2005 11:11:25
Type: Polynomial
Uncertainty: 0.993 %
Coefficients: -0.264059 -5.138468 0.638383
-0.089199 0.005011 -0.000129

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.41keV)
Stop channel: 4000 (2000.67keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 2.0180E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 2.0180E+03) =
4.9554E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	11-Sep-2006 14:44:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	103_150K_05AUG05.Pbc 08-Aug-2005 12:54:15
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 17 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.1218

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
75.00	113.	23.45	0.99	9.052E-03	74.81	9.600	8.700E-01	PB212
77.30	122.	18.64	0.99	1.011E-02	77.11	17.500	6.516E-01	PB212
					77.11	10.700	1.066E+00	PB214
92.91	84.	40.68	1.50	1.645E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
186.41	180.	22.38	1.14	2.565E-02	185.99	3.280	1.333E+00	RA226
238.77	908.	4.00	1.09	2.320E-02	238.63	43.100	6.003E-01	PB212
242.05	140.	17.67	1.10	2.302E-02	241.00	3.900	1.042E+00	RA224
					241.92	7.470	5.451E-01	PB214
295.37	262.	10.55	1.03	2.024E-02	295.22	19.200	4.443E-01	PB214
328.22	53.	37.31	1.20	1.873E-02				
338.50	229.	12.61	1.22	1.830E-02	338.40	12.010	6.944E-01	AC228
351.98	480.	5.77	1.08	1.775E-02	351.99	37.100	4.819E-01	PB214
463.18	48.	30.76	0.80	1.425E-02				
463.18	48.	30.76	0.80	1.425E-02	463.51	10.000	PBC<MDA	SB125
510.62	146.	14.53	1.68	1.317E-02	510.72	22.500	2.692E-01	TL208
583.20	311.	9.73	1.45	1.184E-02	583.14	86.000	2.019E-01	TL208
609.44	368.	6.54	1.32	1.144E-02	609.32	46.090	4.597E-01	BI214
727.08	64.	22.01	1.68	9.966E-03	727.17	11.800	3.617E-01	BI212
794.91	31.	37.19	1.50	9.301E-03	795.76	85.400	PBC<MDA	CS134
860.82	43.	29.47	1.22	8.766E-03				
911.47	190.	9.39	1.31	8.399E-03	911.07	29.000	5.124E-01	AC228
965.25	31.	37.83	1.54	8.056E-03	964.00	14.580	PBC<MDA	EU152
968.62	167.	11.69	1.77	8.027E-03	968.90	17.460	7.954E-01	AC228
1121.15	114.	16.98	1.68	7.208E-03	1120.28	15.040	6.909E-01	BI214
1461.10	1160.	3.03	1.79	5.931E-03	1460.75	10.700	1.204E+01	K40
1620.77	25.	20.00	0.78	5.487E-03	1620.56	2.750	1.107E+00	BI212

1764.93	78.	11.32	1.88	5.141E-03	1764.51	15.920	6.113E-01	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
655.58	328.22	158.	53.	0.026	111.94	1.195	AC-228	s
1720.67	860.82	49.	43.	0.022	88.41	1.218	TL-208	
3240.35	1620.77	0.	25.	0.013	60.00	0.778	BI-212	l

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-212	148.79	74.81	315.	113.	0.056	70.36	0.993D
PB-212	153.39	77.11	319.	122.	0.061	55.92	0.995A
RA-226	371.98	186.41	593.	168.	0.084	67.14	1.138s
PB-212	476.60	238.72	517.	716.	0.358	17.68	1.009
RA-224	481.92	241.38	643.	112.	0.056	99.98	1.500s
PB-214	483.06	241.95	265.	72.	0.036	94.69	1.411s
PB-214	589.88	295.37	232.	258.	0.129	31.64	1.033
AC-228	676.14	338.50	217.	228.	0.114	37.83	1.219
PB-214	703.11	351.98	142.	474.	0.237	17.31	1.079
SB-125	925.27	463.07	130.	60.	0.030	87.05	1.500
TL-208	1020.34	510.62	139.	119.	0.060	43.59	1.675s
TL-208	1165.51	583.20	164.	307.	0.154	29.19	1.451
BI-214	1217.97	609.44	88.	362.	0.181	19.62	1.319
BI-212	1453.23	727.08	56.	64.	0.032	66.03	1.683s
CS-134	1588.88	794.91	50.	31.	0.015	111.56	1.500s
AC-228	1821.96	911.47	57.	186.	0.093	28.16	1.314
EU-152	1929.51	965.25	57.	31.	0.016	113.50	1.538
AC-228	1936.26	968.62	65.	166.	0.083	35.06	1.766s
BI-214	2241.28	1121.15	72.	112.	0.056	50.95	1.677s
K-40	2921.06	1461.10	37.	1142.	0.571	9.09	1.791
BI-214	3528.61	1764.93	3.	75.	0.037	33.97	1.875

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	MDA Value pCi/gm	COMMENTS
BE-7		1.3716E-01					
			477.56	1.372E-01	%(	2.534E-01 7.73E-02	G
K-40		1.2045E+01					
			1460.75	1.204E+01	(P	3.289E-01 3.71E-01	G
MN-54		-1.0580E-04					
			834.81	-1.058E-04	%(P	3.294E-02 9.37E-03	G
CO-57		-5.5577E-03					
			122.07	-5.558E-03	%(P	3.225E-02 9.60E-03	G K
			136.43	-4.719E-02	&	3.576E-01 1.07E-01	G
CO-60		-8.8364E-03					
			1332.51	-8.836E-03	%(P	3.426E-02 9.55E-03	G K
			1173.23	-4.960E-03	% P	4.661E-02 1.33E-02	G K
Sr-85		-1.7412E-02					
			514.00	-1.741E-02	%(	3.670E-02 1.11E-02	G
Kr-85		-4.0178E+02					
			513.99	-4.018E+02	%(	8.467E+02 2.57E+02	G
Y-88		2.2118E-03					
			1836.01	2.212E-03	%(P	2.570E-02 6.90E-03	G K
			898.02	-8.692E-04	& P	2.417E-02 6.60E-03	G
NB-94		-1.3082E-03					
			871.10	-1.308E-03	%(	2.778E-02 7.86E-03	G K
			702.50	4.140E-03	%	2.848E-02 8.27E-03	G K
Ag-108M		-1.4577E-02					
			722.95	-1.458E-02	%(	3.776E-02 1.13E-02	G K
			614.37	-2.223E-02	% P	3.604E-02 1.11E-02	G
			433.93	3.128E-03	%	2.931E-02 8.58E-03	G
CD-109		9.8443E-01					
			88.04	9.844E-01	&(	1.655E+00 5.04E-01	G
SN-113		1.0322E-03					
			391.71	1.032E-03	&(	4.149E-02 1.21E-02	G K
			255.04	-3.492E-01	%	1.518E+00 4.54E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	7.6107E-02						
		427.95	6.172E-03	&(P	8.239E-02	2.40E-02	G K
		600.77	4.635E-02	% P	1.438E-01	4.28E-02	G
		636.15	-1.834E-02	% P	2.030E-01	5.76E-02	G
		463.51	2.831E-01	(P	2.623E-01	8.39E-02	G
		176.29	1.318E-01	&	4.563E-01	1.37E-01	G
I-131	-3.2795E-04						
		364.48	-3.279E-04	%(P	3.278E-02	9.54E-03	G K
		636.97	5.845E-02	%	3.824E-01	1.11E-01	G
		284.29	-7.664E-02	% P	4.735E-01	1.41E-01	G
CS-134	1.4080E-02						
		604.66	3.747E-03	%(	2.374E-02	6.88E-03	G K
		795.76	2.589E-02	(P	3.014E-02	9.65E-03	G
		569.29	3.996E-02	% P	1.720E-01	5.05E-02	G
		801.84	4.672E-02	& P	3.201E-01	9.18E-02	G
CS-137	-3.3033E-03						
		661.62	-3.303E-03	%(P	3.624E-02	1.04E-02	G
CE-139	8.1215E-03						
		165.85	8.122E-03	&(	3.891E-02	1.17E-02	G
EU-152	3.5753E-02						
		121.78	-3.525E-02	%(P	1.317E-01	3.96E-02	G K
		344.30	-2.167E-02	% P	1.005E-01	2.99E-02	G
		1408.08	2.112E-02	%	1.267E-01	3.58E-02	G
		964.00	1.782E-01	(P	2.160E-01	6.86E-02	G
		1112.07	0.000E+00	%	2.610E-01	7.36E-02	G
		778.90	-5.330E-02	%	2.509E-01	7.37E-02	G
EU-154	-2.5052E-02						
		123.10	-2.505E-02	%(	9.746E-02	2.93E-02	G K
		1274.80	-2.183E-03	&	1.113E-01	3.15E-02	G
		723.30	-7.233E-02	%	1.754E-01	5.28E-02	G
		1004.80	-4.559E-02	&	2.032E-01	5.95E-02	G
EU-155	1.5436E-03						
		86.45	1.544E-03	%(	2.066E-01	6.15E-02	G K
		105.31	2.553E-02	&	2.064E-01	6.17E-02	G
HG-203	-7.6741E-03						
		279.17	-7.674E-03	&(P	3.670E-02	1.10E-02	G K
		72.87	-3.411E-01	% P	1.756E+00	5.26E-01	G
		70.83	-1.045E+00	%	3.593E+00	1.08E+00	G
		82.50	-8.362E-01	&	3.136E+00	9.43E-01	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments

TL-208       2.0188E-01
                          583.14 2.019E-01  (P 4.100E-02 1.99E-02 G
                          510.72 2.692E-01 + P 1.302E-01 4.79E-02 G

PB-212       4.7942E-01
                          238.63 4.794E-01  (P 7.279E-02 2.87E-02 G K
                                                          Energy duplication
                           77.11 4.611E-01 } P 3.250E-01 8.59E-02 G
                           74.81 8.700E-01 + P 6.584E-01 2.10E-01 G

PB-214       4.6907E-01
                          351.99 4.819E-01  (P 5.922E-02 2.81E-02 G K
                          295.22 4.443E-01  (P 1.269E-01 4.76E-02 G
                                                          Energy duplication
                           77.11 1.856E-01 } P 7.916E-01 1.85E-01 G
                          241.92 2.819E-01 -   3.057E-01 8.90E-02 G

BI-212       3.6167E-01
                          727.17 3.617E-01 @(P 2.149E-01 8.02E-02 G K
                         1620.56 3.470E-01 % P 6.688E-01 2.07E-01 G
                          785.42 7.013E-01 %   1.552E+00 4.69E-01 G

BI-214       4.5969E-01
                          609.32 4.597E-01  (P 5.899E-02 3.06E-02 G K
                         1764.51 6.113E-01 + P 9.113E-02 7.23E-02 G
                         1120.28 6.909E-01 + P 2.610E-01 1.19E-01 G

RA-224       8.3514E-01
                          241.00 8.351E-01 &(  8.998E-01 2.78E-01 G

RA-226       1.3327E+00
                          185.99 1.333E+00 *(P 9.246E-01 3.21E-01 G

AC-228       5.1242E-01
                          911.07 5.124E-01  (P 1.038E-01 4.90E-02 G K
                          968.90 7.954E-01 + P 1.919E-01 9.30E-02 G
                          338.40 6.944E-01 + P 2.174E-01 8.80E-02 G

TH-227      -1.1924E-01
                          236.00-1.192E-01 %(  3.444E-01 1.04E-01 G K
                          256.25-6.543E-02 % P 4.203E-01 1.25E-01 G

PA-234      -4.5544E-03
                           98.44-4.554E-03 %(P 2.072E-01 6.17E-02 G K
                          946.00-4.394E-04 % P 1.445E-01 4.05E-02 G
                          131.28 6.545E-02 % P 1.642E-01 4.96E-02 G
                           94.67 1.237E-02 % P 2.755E-01 8.17E-02 G
                          883.24 1.482E-03 &   1.612E-01 4.37E-02 G
                          926.70-4.719E-02 %   3.024E-01 8.77E-02 G
```

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 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26 5.930E-02 % P 2.552E-01 7.49E-02 G

TH-234       4.1292E-01
                           63.29 4.129E-01 %(P 5.816E+00 1.73E+00 G K
                           92.80 1.137E+00 % P 1.845E+00 5.60E-01 G
                           92.38 1.258E+00 % P 2.262E+00 6.85E-01 G

AM-241       7.1004E-03
                           59.54 7.100E-03 %(P 9.975E-01 2.96E-01 G
   ( - This peak used in the nuclide activity average.

   * - Peak is too wide, but only one peak in library.
   ! - Peak is part of a multiplet and this area went
       negative during deconvolution.
   ? - Peak is too narrow.
   @ - Peak is too wide at FW25M, but ok at FWHM.
   % - Peak fails sensitivity test.
   $ - Peak identified, but first peak of this nuclide
       failed one or more qualification tests.
   + - Peak activity higher than counting uncertainty range.
   - - Peak activity lower than counting uncertainty range.
   = - Peak outside analysis energy range.
   & - Calculated peak centroid is not close enough to the
       library energy centroid for positive identification.
   P - Peakbackground subtraction
   } - Peak is too close to another for the activity
       to be found directly.

   Nuclide Codes:                      Peak Codes:
   T - Thermal Neutron Activation      G - Gamma Ray
   F - Fast Neutron Activation         X - X-Ray
   I - Fission Product                 P - Positron Decay
   N - Naturally Occurring Isotope     S - Single-Escape
   P - Photon Reaction                 D - Double-Escape
   C - Charged Particle Reaction       K - Key Line
   M - No MDA Calculation              A - Not in Average
   R - Coincidence Corrected           C - Coincidence Peak
   H - Halflife limit exceeded

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
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***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	1.3707E-01	1.3716E-01	2.3196E-01	2.3210E-01	2.532E-01
K-40		1.2045E+01	1.2045E+01	1.1130E+00	1.3145E+00	
MN-54	#A	-1.0579E-04	-1.0580E-04	6.4955E-02	6.4955E-02	3.294E-02
CO-57	#B	-5.5569E-03	-5.5577E-03	3.0339E-02	3.0340E-02	3.225E-02
CO-60	#B	-8.8363E-03	-8.8364E-03	5.5141E-02	5.5143E-02	3.426E-02

Sr-85	#A	-1.7402E-02	-1.7412E-02	3.3371E-02	3.3387E-02	3.668E-02
Kr-85	#A	-4.0178E+02	-4.0178E+02	7.6998E+02	7.7033E+02	8.467E+02
Y-88	#B	2.2111E-03	2.2118E-03	2.0696E-02	2.0696E-02	2.569E-02
NB-94	#B	-1.3082E-03	-1.3082E-03	2.3585E-02	2.3586E-02	2.778E-02
Ag-108M	#B	-1.4577E-02	-1.4577E-02	3.4007E-02	3.4018E-02	3.776E-02
CD-109	#A	9.8435E-01	9.8443E-01	1.5131E+00	1.5141E+00	1.655E+00
SN-113	#B	1.0319E-03	1.0322E-03	3.6278E-02	3.6278E-02	4.148E-02
SB-125	#B	7.6104E-02	7.6107E-02	6.7650E-02	6.7794E-02	8.238E-02
I-131	#B	-3.2647E-04	-3.2795E-04	3.9156E-02	3.9156E-02	3.263E-02
CS-134	#B	1.4080E-02	1.4080E-02	1.5753E-02	1.5774E-02	2.374E-02
CS-137	#A	-3.3033E-03	-3.3033E-03	5.9236E-02	5.9236E-02	3.624E-02
CE-139	#A	8.1194E-03	8.1215E-03	3.4969E-02	3.4972E-02	3.890E-02
EU-152	#B	3.5753E-02	3.5753E-02	4.1288E-02	4.1335E-02	1.317E-01
EU-154	#B	-2.5051E-02	-2.5052E-02	8.7902E-02	8.7913E-02	9.746E-02
EU-155	#B	1.5436E-03	1.5436E-03	1.8458E-01	1.8458E-01	2.066E-01
HG-203	#B	-7.6682E-03	-7.6741E-03	3.2988E-02	3.2991E-02	3.667E-02
TL-208		2.0188E-01	2.0188E-01	5.9750E-02	6.0889E-02	
PB-212		4.7942E-01	4.7942E-01	8.6168E-02	9.0552E-02	
PB-214		4.6907E-01	4.6907E-01	8.2176E-02	8.6571E-02	
BI-212	#	3.6167E-01	3.6167E-01	2.4065E-01	2.4157E-01	
BI-214		4.5969E-01	4.5969E-01	9.1809E-02	9.5610E-02	
RA-224	#A	8.3514E-01	8.3514E-01	8.3501E-01	8.3642E-01	8.998E-01
RA-226	#	1.3327E+00	1.3327E+00	9.6395E-01	9.6705E-01	
AC-228		5.1242E-01	5.1242E-01	1.4692E-01	1.4990E-01	
TH-227	#B	-1.1924E-01	-1.1924E-01	3.1170E-01	3.1178E-01	3.444E-01
PA-234	#B	-4.5544E-03	-4.5544E-03	3.5718E-01	3.5718E-01	2.072E-01
TH-234	#B	4.1292E-01	4.1292E-01	5.1881E+00	5.1881E+00	5.816E+00
AM-241	#A	7.1004E-03	7.1004E-03	8.8819E-01	8.8819E-01	9.975E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (85.9 to 2000.7 keV) 1.5861854E+01 pCi/gm
Total Decayed Activity (85.9 to 2000.7 keV) 1.5861854E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JPK

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 103F_13SEPT2004_1249.An1

Sample description
FSS-OOL-05-09-008-F

Spectrum Filename: C:\GammaVision\Spectra\103F_13SEPT2004_1249.An1

Acquisition information
Start time: 13-Sep-2006 12:49:46
Live time: 2000
Real time: 2002
Dead time: 0.09 %
Detector ID: 4

Detector system
Det 103 - DSPE-471

Calibration
Filename: D3_1LSa.Clb
Detector_103 1.0 Liter Sand Geometry

Energy Calibration
Created: 08-Aug-2005 11:09:41
Zero offset: 0.409 keV
Gain: 0.500 keV/channel
Quadratic: 1.092E-08 keV/channel^2

Efficiency Calibration
Created: 08-Aug-2005 11:11:25
Type: Polynomial
Uncertainty: 0.993 %
Coefficients: -0.264059 -5.138468 0.638383
-0.089199 0.005011 -0.000129

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.41keV)
Stop channel: 4000 (2000.67keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 1.7140E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.7140E+03) =
5.8343E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	11-Sep-2006 14:24:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	103_150K_05AUG05.Pbc 08-Aug-2005 12:54:15
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 18 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.1410

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
74.94	84.	28.45	0.99	9.052E-03	74.81	9.600	7.641E-01	PB212
77.24	101.	21.07	0.99	1.011E-02	77.11	17.500	5.909E-01	PB212
					77.11	10.700	9.664E-01	PB214
86.69	92.	29.16	1.00	1.414E-02	86.45	32.740	1.572E-01	EU155
					88.04	3.790	1.304E+00	CD109
90.24	62.	38.27	1.00	1.549E-02				
93.16	118.	22.25	1.00	1.652E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
186.27	152.	22.16	1.64	2.566E-02	185.99	3.280	1.306E+00	RA226
209.22	71.	35.66	0.96	2.472E-02				
238.68	899.	3.88	1.09	2.320E-02	238.63	43.100	6.995E-01	PB212
241.82	163.	14.52	1.10	2.303E-02	241.00	3.900	1.427E+00	RA224
					241.92	7.470	7.468E-01	PB214
270.31	84.	29.68	1.73	2.151E-02				
295.17	233.	11.47	1.12	2.025E-02	295.22	19.200	4.639E-01	PB214
338.34	197.	13.86	0.86	1.830E-02	338.40	12.010	7.016E-01	AC228
351.93	372.	9.54	1.05	1.776E-02	351.99	37.100	4.384E-01	PB214
463.35	87.	26.02	1.25	1.425E-02				
463.35	87.	26.02	1.25	1.425E-02	463.51	10.000	4.773E-01	SB125
511.29	159.	14.65	1.28	1.316E-02	510.72	22.500	3.523E-01	TL208
583.15	301.	7.48	1.28	1.184E-02	583.14	86.000	2.298E-01	TL208
609.41	291.	7.97	1.33	1.144E-02	609.32	46.090	4.252E-01	BI214
661.87	62.	28.60	1.27	1.072E-02	661.62	84.620	5.224E-02	CS137
727.28	82.	23.25	1.51	9.964E-03	727.17	11.800	5.458E-01	BI212
860.67	74.	20.88	1.15	8.767E-03				
911.18	229.	10.72	1.49	8.401E-03	911.07	29.000	7.302E-01	AC228
964.67	42.	22.48	1.54	8.052E-03				

969.04	110.	11.94	1.54	8.025E-03	968.90	17.460	6.174E-01	AC228
1120.41	108.	17.96	1.16	7.211E-03	1120.28	15.040	7.749E-01	BI214
1156.46	40.	38.08	0.66	7.046E-03				
1460.90	1043.	3.25	1.99	5.932E-03	1460.75	10.700	1.272E+01	K40
1764.78	67.	12.22	1.12	5.141E-03	1764.51	15.920	6.138E-01	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide
179.66	90.09	248.	62.	0.031	114.80	1.003	PB-214 lD
185.12	93.00	296.	106.	0.053	74.63	1.004	TH-234 D
417.60	209.22	285.	71.	0.036	106.98	0.962	AC-228
539.77	270.31	224.	84.	0.042	89.04	1.730	AC-228 s
1720.38	860.67	51.	74.	0.037	62.65	1.154	TL-208 s
1928.65	964.71	24.	43.	0.021	67.37	1.538	AC-228 D
2311.87	1156.46	64.	40.	0.020	114.24	0.656	BI-214 s

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-212	148.79	74.81	268.	84.	0.042	85.36	0.993D
PB-212	153.39	77.11	290.	101.	0.050	63.21	0.995A
EU-155	173.47	87.15	711.	119.	0.060	98.61	1.500
CD-109	173.44	87.13	669.	115.	0.057	99.72	1.500
TH-234	185.12	92.97	727.	114.	0.057	89.72	1.500s
TH-234	185.13	92.98	687.	122.	0.061	82.56	1.500s
RA-226	371.96	186.40	538.	129.	0.064	73.06	1.500s
PB-212	476.48	238.66	575.	656.	0.328	20.17	1.091
RA-224	482.60	241.72	563.	157.	0.079	68.25	1.500
PB-214	482.71	241.78	301.	59.	0.030	124.20	1.348s
PB-214	589.49	295.17	204.	229.	0.114	34.42	1.118
AC-228	675.81	338.34	203.	196.	0.098	41.57	0.863s
PB-214	702.99	351.93	275.	366.	0.183	28.63	1.052
SB-125	924.85	462.87	107.	66.	0.033	74.56	1.500
TL-208	1021.70	511.29	151.	132.	0.066	43.95	1.285s
TL-208	1165.40	583.15	78.	297.	0.148	22.45	1.279s
BI-214	1217.91	609.41	95.	284.	0.142	23.92	1.326
CS-137	1322.54	661.73	123.	71.	0.035	97.20	1.288s
BI-212	1453.64	727.28	86.	81.	0.041	69.76	1.509s
AC-228	1821.38	911.18	88.	226.	0.113	32.17	1.491
AC-228	1936.81	968.90	31.	110.	0.055	35.82	1.541D
BI-214	2239.79	1120.41	79.	107.	0.053	53.88	1.157
K-40	2920.67	1460.90	47.	1024.	0.512	9.75	1.989

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
BI-214	3528.31	1764.78	3.	64.	0.032	36.65	1.121s

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	Peak MDA Value pCi/gm	COMMENTS
BE-7		1.0629E-01					
			477.56	1.063E-01	%(	3.117E-01 9.32E-02	G
K-40		1.2723E+01					
			1460.75	1.272E+01	(P	4.293E-01 4.21E-01	G
MN-54		-1.2557E-03					
			834.81	-1.256E-03	&(P	3.860E-02 1.10E-02	G
CO-57		1.0647E-02					
			122.07	1.065E-02	&(P	4.956E-02 1.49E-02	G K
			136.43	5.454E-02	%	3.773E-01 1.13E-01	G
CO-60		-3.2894E-03					
			1332.51	-3.289E-03	%(P	5.133E-02 1.43E-02	G K
			1173.23	-1.148E-02	% P	5.014E-02 1.45E-02	G K
Sr-85		-1.6350E-02					
			514.00	-1.635E-02	%(	4.612E-02 1.39E-02	G
Kr-85		-3.6971E+02					
			513.99	-3.697E+02	%(	1.043E+03 3.13E+02	G
Y-88		-1.0150E-04					
			1836.01	-1.015E-04	%(P	4.241E-02 1.15E-02	G K
			898.02	-5.378E-04	& P	3.832E-02 1.08E-02	G
NB-94		9.7003E-03					
			871.10	9.700E-03	%(	2.823E-02 8.37E-03	G K
			702.50	1.287E-02	%	3.114E-02 9.36E-03	G K
Ag-108M		-1.0247E-02					
			722.95	-1.025E-02	%(	4.350E-02 1.28E-02	G K
			614.37	-5.390E-03	% P	3.823E-02 1.11E-02	G
			433.93	-5.415E-03	%	3.592E-02 1.06E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CD-109	1.6249E+00						
		88.04	1.625E+00	&(	1.746E+00	5.40E-01	G
SN-113	-4.2109E-04						
		391.71	-4.211E-04	%(	4.431E-02	1.28E-02	G K
		255.04	5.152E-01	%	1.567E+00	4.71E-01	G
SB-125	9.2305E-02						
		427.95	8.588E-05	%(P	1.068E-01	3.10E-02	G K
		600.77	-2.484E-02	& P	1.807E-01	5.27E-02	G
		636.15	3.072E-02	& P	2.794E-01	8.06E-02	G
		463.51	3.653E-01	(P	2.823E-01	9.25E-02	G
		176.29	1.436E-02	&	5.909E-01	1.76E-01	G
I-131	-9.1091E-03						
		364.48	-9.109E-03	%(P	4.255E-02	1.26E-02	G K
		636.97	1.150E-01	&	4.643E-01	1.36E-01	G
		284.29	-1.089E-01	& P	6.356E-01	1.89E-01	G
CS-134	5.4311E-03						
		604.66	5.431E-03	&(	3.385E-02	9.89E-03	G K
		795.76	1.794E-02	% P	4.002E-02	1.21E-02	G
		569.29	5.918E-02	% P	1.683E-01	4.99E-02	G
		801.84	-1.601E-02	& P	4.688E-01	1.33E-01	G
CS-137	6.1540E-02						
		661.62	6.154E-02	*(P	4.730E-02	2.03E-02	G
CE-139	1.6174E-03						
		165.85	1.617E-03	%(	4.152E-02	1.23E-02	G
EU-152	3.0410E-02						
		121.78	3.041E-02	&(P	1.447E-01	4.34E-02	G K
		344.30	-2.268E-02	% P	1.268E-01	3.76E-02	G
		1408.08	6.729E-02	%	1.471E-01	4.45E-02	G
		964.00	-6.714E-02	& P	2.668E-01	7.79E-02	G
		1112.07	2.602E-02	&	3.126E-01	8.95E-02	G
		778.90	1.234E-02	%	2.524E-01	7.19E-02	G
EU-154	1.8112E-02						
		123.10	1.811E-02	&(	1.044E-01	3.12E-02	G K
		1274.80	3.985E-02	&	1.084E-01	3.23E-02	G
		723.30	-4.847E-02	%	1.949E-01	5.76E-02	G
		1004.80	4.852E-03	%	2.046E-01	5.76E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
EU-155	2.0406E-01						
		86.45	2.041E-01	(	2.169E-01	6.71E-02	G K
		105.31	5.528E-02	%	2.186E-01	6.56E-02	G
HG-203	-1.1655E-02						
		279.17	-1.166E-02	&(P	4.297E-02	1.29E-02	G K
		72.87	-8.927E-01	% P	2.235E+00	6.76E-01	G
		70.83	1.026E-01	&	4.425E+00	1.32E+00	G
		82.50	-1.408E+00	%	3.892E+00	1.17E+00	G
TL-208	2.2979E-01						
		583.14	2.298E-01	*(P	3.397E-02	1.74E-02	G
		510.72	3.523E-01	+ P	1.593E-01	6.20E-02	G
PB-212	5.3866E-01						
		238.63	5.175E-01	(P	9.023E-02	3.54E-02	G K
							Energy duplication
		77.11	4.481E-01	} P	3.658E-01	9.44E-02	G
		74.81	7.641E-01	+ P	7.169E-01	2.25E-01	G
PB-214	4.4712E-01						
		351.99	4.384E-01	(P	9.571E-02	4.25E-02	G K
		295.22	4.639E-01	(P	1.406E-01	5.42E-02	G
							Energy duplication
		77.11	1.167E-02	} P	8.784E-01	2.03E-01	G
		241.92	2.714E-01	-	3.830E-01	1.12E-01	G
BI-212	5.4584E-01						
		727.17	5.458E-01	*(P	3.073E-01	1.28E-01	G K
		1620.56	2.641E-01	& P	1.029E+00	2.93E-01	G
		785.42	5.032E-01	%	1.476E+00	4.38E-01	G
BI-214	4.2518E-01						
		609.32	4.252E-01	(P	7.186E-02	3.47E-02	G K
		1764.51	6.138E-01	+ P	1.073E-01	7.88E-02	G
		1120.28	7.749E-01	+ P	3.215E-01	1.42E-01	G
RA-224	1.3797E+00						
		241.00	1.380E+00	(	9.924E-01	3.14E-01	G
RA-226	1.2063E+00						
		185.99	1.206E+00	*(P	1.038E+00	3.23E-01	G
AC-228	6.9063E-01						
		911.07	7.302E-01	(P	1.505E-01	7.95E-02	G K
		968.90	6.174E-01	(P	1.619E-01	7.38E-02	G
		338.40	7.016E-01	*(P	2.481E-01	9.77E-02	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments

TH-227      -3.2105E-03
                          236.00-3.211E-03 %(  4.023E-01 1.20E-01 G K
                          256.25 1.992E-01 & P 4.183E-01 1.27E-01 G

PA-234      -1.8171E-02
                           98.44-1.817E-02 %(P 2.224E-01 6.63E-02 G K
                          946.00-4.564E-02 % P 1.931E-01 5.66E-02 G
                          131.28-1.017E-02 & P 2.105E-01 6.26E-02 G
                           94.67-8.857E-02 % P 3.986E-01 1.20E-01 G
                          883.24-6.662E-03 %   2.572E-01 7.21E-02 G
                          926.70 5.417E-02 %   2.754E-01 7.95E-02 G
                          569.26 8.766E-02 % P 2.600E-01 7.69E-02 G

TH-234       2.0604E+00
                           63.29 2.088E+00 %(P 6.037E+00 1.81E+00 G K
                           92.80 1.951E+00 *(P 1.995E+00 6.14E-01 G
                           92.38 2.146E+00 *(P 2.416E+00 7.41E-01 G

AM-241      -1.8409E-01
                           59.54-1.841E-01 &(P 1.127E+00 3.37E-01 G
   ( - This peak used in the nuclide activity average.

   * - Peak is too wide, but only one peak in library.
   ! - Peak is part of a multiplet and this area went
       negative during deconvolution.
   ? - Peak is too narrow.
   @ - Peak is too wide at FW25M, but ok at FWHM.
   % - Peak fails sensitivity test.
   $ - Peak identified, but first peak of this nuclide
       failed one or more qualification tests.
   + - Peak activity higher than counting uncertainty range.
   - - Peak activity lower than counting uncertainty range.
   = - Peak outside analysis energy range.
   & - Calculated peak centroid is not close enough to the
       library energy centroid for positive identification.
   P - Peakbackground subtraction
   } - Peak is too close to another for the activity
       to be found directly.

   Nuclide Codes:                      Peak Codes:
   T - Thermal Neutron Activation      G - Gamma Ray
   F - Fast Neutron Activation         X - X-Ray
   I - Fission Product                 P - Positron Decay
   N - Naturally Occurring Isotope     S - Single-Escape
   P - Photon Reaction                 D - Double-Escape
   C - Charged Particle Reaction       K - Key Line
   M - No MDA Calculation              A - Not in Average
```

R - Coincidence Corrected C - Coincidence Peak
H - Halflife limit exceeded

- -

***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	1.0365E-01	1.0629E-01	2.7973E-01	2.7979E-01	3.040E-01
K-40		1.2723E+01	1.2723E+01	1.2634E+00	1.4635E+00	
MN-54	#A	-1.2503E-03	-1.2557E-03	5.5192E-02	5.5192E-02	3.844E-02
CO-57	#B	1.0595E-02	1.0647E-02	4.4565E-02	4.4569E-02	4.931E-02
CO-60	#B	-3.2871E-03	-3.2894E-03	2.2664E-01	2.2664E-01	5.130E-02
Sr-85	#A	-1.6015E-02	-1.6350E-02	4.1570E-02	4.1581E-02	4.517E-02
Kr-85	#A	-3.6971E+02	-3.6971E+02	9.4004E+02	9.4028E+02	1.043E+03
Y-88	#B	-1.0023E-04	-1.0150E-04	4.3567E-03	4.3567E-03	4.188E-02
NB-94	#B	9.7003E-03	9.7003E-03	2.5096E-02	2.5102E-02	2.823E-02
Ag-108M	#B	-1.0247E-02	-1.0247E-02	3.8509E-02	3.8514E-02	4.349E-02
CD-109	#A	1.6201E+00	1.6249E+00	1.6204E+00	1.6229E+00	1.741E+00
SN-113	#B	-4.1621E-04	-4.2109E-04	3.8496E-02	3.8496E-02	4.379E-02
SB-125	#B	9.2182E-02	9.2305E-02	7.0151E-02	7.0355E-02	1.066E-01
I-131	#B	-7.7098E-03	-9.1091E-03	4.1680E-02	4.1684E-02	3.602E-02
CS-134	#B	5.4215E-03	5.4311E-03	2.9670E-02	2.9672E-02	3.379E-02
CS-137	#	6.1533E-02	6.1540E-02	6.0990E-02	6.1094E-02	
CE-139	#A	1.6017E-03	1.6174E-03	3.6938E-02	3.6938E-02	4.112E-02
EU-152	#B	3.0401E-02	3.0410E-02	1.3010E-01	1.3011E-01	1.447E-01
EU-154	#B	1.8104E-02	1.8112E-02	9.3745E-02	9.3751E-02	1.044E-01
EU-155	#A	2.0391E-01	2.0406E-01	2.0123E-01	2.0154E-01	2.168E-01
HG-203	#B	-1.1325E-02	-1.1655E-02	3.8720E-02	3.8726E-02	4.175E-02
TL-208	#	2.2979E-01	2.2979E-01	5.2326E-02	5.4000E-02	
PB-212		5.3866E-01	5.3866E-01	1.1065E-01	1.1498E-01	
PB-214		4.4712E-01	4.4712E-01	1.0177E-01	1.0502E-01	
BI-212	#	5.4584E-01	5.4584E-01	3.8311E-01	3.8442E-01	
BI-214		4.2518E-01	4.2518E-01	1.0403E-01	1.0692E-01	
RA-224		1.3797E+00	1.3797E+00	9.4161E-01	9.4501E-01	9.924E-01
RA-226	#	1.2063E+00	1.2063E+00	9.7000E-01	9.7253E-01	1.038E+00
AC-228		6.9063E-01	6.9063E-01	1.4741E-01	1.5276E-01	
TH-227	#B	-3.2105E-03	-3.2105E-03	3.5896E-01	3.5896E-01	4.023E-01
PA-234	#B	-1.8171E-02	-1.8171E-02	2.3987E-01	2.3987E-01	2.224E-01
TH-234	#B	2.0604E+00	2.0604E+00	1.9468E+00	1.9502E+00	6.037E+00
AM-241	#A	-1.8409E-01	-1.8409E-01	1.0309E+00	1.0309E+00	1.127E+00

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.

H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (1120.0 to 2000.7 keV) 1.7041508E+01 pCi/gm
Total Decayed Activity (1120.0 to 2000.7 keV) 1.7041515E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JPK

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 103F_13SEPT2006_1046.An1

Sample description
FSS-OOL-05-09-017-F

Spectrum Filename: C:\GammaVision\Spectra\103F_13SEPT2006_1046.An1

Acquisition information
Start time: 13-Sep-2006 10:46:49
Live time: 2000
Real time: 2002
Dead time: 0.10 %
Detector ID: 4

Detector system
Det 103 - DSPE-471

Calibration
Filename: D3_1LSa.Clb
Detector_103 1.0 Liter Sand Geometry

Energy Calibration
Created: 08-Aug-2005 11:09:41
Zero offset: 0.409 keV
Gain: 0.500 keV/channel
Quadratic: 1.092E-08 keV/channel^2

Efficiency Calibration
Created: 08-Aug-2005 11:11:25
Type: Polynomial
Uncertainty: 0.993 %
Coefficients: -0.264059 -5.138468 0.638383
-0.089199 0.005011 -0.000129

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.41keV)
Stop channel: 4000 (2000.67keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 2.0170E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 2.0170E+03) =
4.9579E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	11-Sep-2006 14:50:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	103_150K_05AUG05.Pbc 08-Aug-2005 12:54:15
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 15 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.0579

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
74.95	97.	26.56	0.99	9.052E-03	74.81	9.600	7.492E-01	PB212
77.25	156.	15.03	0.99	1.011E-02	77.11	17.500	7.912E-01	PB212
					77.11	10.700	1.294E+00	PB214
87.00	74.	36.34	1.00	1.432E-02				
89.91	83.	34.64	1.00	1.542E-02	88.04	3.790	9.974E-01	CD109
93.59	84.	32.50	1.00	1.672E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
					94.67	15.500	PBC<MDA	PA234
129.32	82.	39.05	1.10	2.440E-02				
186.28	105.	32.08	0.74	2.566E-02	185.99	3.280	PBC<MDA	RA226
209.81	106.	32.39	0.90	2.469E-02				
238.83	1037.	4.65	1.11	2.319E-02	238.63	43.100	6.868E-01	PB212
241.60	102.	36.81	1.50	2.307E-02	241.00	3.900	PBC<MDA	RA224
					241.92	7.470	3.960E-01	PB214
295.31	214.	11.34	1.11	2.024E-02	295.22	19.200	3.615E-01	PB214
300.33	91.	25.38	1.07	2.000E-02				
338.44	262.	12.03	1.41	1.830E-02	338.40	12.010	7.953E-01	AC228
351.99	381.	8.58	1.34	1.775E-02	351.99	37.100	3.822E-01	PB214
463.03	81.	27.97	1.33	1.426E-02				
463.03	81.	27.97	1.33	1.426E-02	463.51	10.000	3.745E-01	SB125
511.20	137.	17.44	1.48	1.316E-02	510.72	22.500	2.501E-01	TL208
583.15	340.	7.66	1.18	1.184E-02	583.14	86.000	2.207E-01	TL208
609.28	270.	8.01	1.34	1.144E-02	609.32	46.090	3.347E-01	BI214
727.11	83.	20.71	1.94	9.965E-03	727.17	11.800	4.690E-01	BI212
794.59	33.	34.62	1.47	9.312E-03				
794.59	33.	34.62	1.47	9.312E-03	795.76	85.400	PBC<MDA	CS134
860.61	48.	24.14	1.47	8.767E-03				

911.19	245.	8.03	1.57	8.400E-03	911.07	29.000	6.653E-01	AC228
967.85	214.	8.24	1.79	8.032E-03	968.90	17.460	1.025E+00	AC228
1120.36	80.	20.62	1.43	7.211E-03	1120.28	15.040	4.825E-01	BI214
1460.81	1112.	3.04	1.93	5.932E-03	1460.75	10.700	1.154E+01	K40
1764.70	53.	14.92	1.73	5.141E-03	1764.51	15.920	4.103E-01	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
173.18	87.00	323.	74.	0.037	109.01	1.001	PB-214	lD
179.00	89.91	370.	83.	0.041	103.91	1.002	PB-214	lD
186.36	93.60	331.	84.	0.042	97.49	1.005	U-235	lD
418.78	209.81	445.	106.	0.053	97.17	0.901	NP-239	s
599.81	300.33	194.	91.	0.046	76.13	1.067	PB-212	
1588.25	794.59	50.	29.	0.015	116.84	1.472	AC-228	
1720.26	860.61	38.	48.	0.024	72.43	1.467	TL-208	

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-212	148.79	74.81	308.	97.	0.049	79.68	0.993D
PB-212	153.39	77.11	329.	156.	0.078	45.09	0.995A
PB-212	476.73	238.78	534.	880.	0.440	15.76	1.095
RA-224	482.35	241.60	649.	102.	0.051	110.42	1.500s
PB-214	589.77	295.31	182.	210.	0.105	34.03	1.112
AC-228	676.02	338.44	245.	261.	0.130	36.10	1.413s
PB-214	703.11	351.99	228.	376.	0.188	25.75	1.337
SB-125	925.11	463.00	120.	68.	0.034	75.46	1.500
TL-208	1021.52	511.20	167.	111.	0.055	52.32	1.477s
TL-208	1165.41	583.15	114.	335.	0.168	22.99	1.181
BI-214	1217.65	609.28	80.	263.	0.132	24.03	1.339
BI-212	1453.29	727.11	79.	82.	0.041	62.12	1.943s
AC-228	1821.40	911.19	56.	242.	0.121	24.08	1.566
AC-228	1934.71	967.85	32.	214.	0.107	24.71	1.788s
BI-214	2239.70	1120.36	66.	78.	0.039	61.85	1.426s
K-40	2920.49	1460.81	27.	1094.	0.547	9.13	1.929
BI-214	3528.16	1764.70	7.	50.	0.025	44.76	1.726

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	MDA Value pCi/gm	COMMENTS
BE-7		1.1945E-01					
			477.56	1.194E-01	%(	2.717E-01	8.21E-02 G
K-40		1.1543E+01					
			1460.75	1.154E+01	(P	2.862E-01	3.57E-01 G
MN-54		4.3499E-03					
			834.81	4.350E-03	%(P	3.213E-02	9.30E-03 G
CO-57		-1.0429E-02					
			122.07	-1.043E-02	%(P	4.561E-02	1.37E-02 G K
			136.43	-9.804E-03	&	3.523E-01	1.05E-01 G
CO-60		4.6992E-03					
			1332.51	4.699E-03	%(P	3.149E-02	8.80E-03 G K
			1173.23	-9.924E-03	% P	4.101E-02	1.18E-02 G K
Sr-85		-1.3691E-02					
			514.00	-1.369E-02	%(	3.767E-02	1.13E-02 G
Kr-85		-3.1001E+02					
			513.99	-3.100E+02	%(	8.528E+02	2.56E+02 G
Y-88		4.9746E-03					
			1836.01	4.975E-03	&(P	1.577E-02	4.48E-03 G K
			898.02	-6.913E-04	% P	3.143E-02	8.80E-03 G
NB-94		1.0431E-03					
			871.10	1.043E-03	&(	2.173E-02	6.03E-03 G K
			702.50	1.374E-03	&	2.725E-02	7.79E-03 G K
Ag-108M		0.0000E+00					
			722.95	0.000E+00	&(	5.788E-02	1.70E-02 G K
			614.37	-8.824E-03	% P	3.044E-02	9.02E-03 G
			433.93	6.329E-05	%	3.032E-02	8.80E-03 G
CD-109		6.8095E-01					
			88.04	6.809E-01	&(	1.568E+00	4.75E-01 G
SN-113		-2.3128E-03					
			391.71	-2.313E-03	&(	4.222E-02	1.23E-02 G K
			255.04	-4.223E-02	%	1.361E+00	4.02E-01 G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	8.5810E-02						
		427.95	6.121E-03	&(P	8.888E-02	2.59E-02	G K
		600.77	4.258E-02	% P	1.284E-01	3.82E-02	G
		636.15	8.702E-02	& P	2.357E-01	7.04E-02	G
		463.51	3.217E-01	(P	2.528E-01	8.24E-02	G
		176.29	1.233E-01	%	4.910E-01	1.47E-01	G
I-131	-8.6450E-03						
		364.48	-8.645E-03	%(P	4.002E-02	1.19E-02	G K
		636.97	-1.306E-01	%	5.188E-01	1.54E-01	G
		284.29	-5.851E-02	% P	4.465E-01	1.32E-01	G
CS-134	-5.4683E-03						
		604.66	-5.468E-03	%(	3.198E-02	9.39E-03	G K
		795.76	3.524E-03	% P	3.738E-02	1.08E-02	G
		569.29	4.087E-02	% P	1.923E-01	5.65E-02	G
		801.84	8.315E-02	% P	2.170E-01	6.37E-02	G
CS-137	5.7075E-03						
		661.62	5.707E-03	&(P	2.826E-02	8.18E-03	G
CE-139	-9.6057E-05						
		165.85	-9.606E-05	%(	3.974E-02	1.18E-02	G
EU-152	-3.0936E-02						
		121.78	-3.094E-02	%(P	1.332E-01	4.00E-02	G K
		344.30	-2.127E-02	% P	9.914E-02	2.94E-02	G
		1408.08	6.068E-03	%	9.839E-02	2.62E-02	G
		964.00	1.205E-01	% P	2.630E-01	7.94E-02	G
		1112.07	1.033E-01	%	2.313E-01	6.98E-02	G
		778.90	7.517E-02	&	2.359E-01	7.01E-02	G
EU-154	-2.1939E-02						
		123.10	-2.194E-02	%(	9.295E-02	2.79E-02	G K
		1274.80	0.000E+00	&	1.205E-01	3.42E-02	G
		723.30	-6.884E-02	&	1.967E-01	5.89E-02	G
		1004.80	-3.212E-02	%	1.659E-01	4.80E-02	G
EU-155	2.0460E-02						
		86.45	2.046E-02	%(	1.833E-01	5.47E-02	G K
		105.31	4.870E-03	%	2.061E-01	6.14E-02	G
HG-203	1.6175E-02						
		279.17	1.617E-02	&(P	3.393E-02	1.03E-02	G K
		72.87	-1.035E-03	% P	1.560E+00	4.62E-01	G
		70.83	-8.707E-02	&	4.019E+00	1.20E+00	G
		82.50	-5.124E-02	&	3.278E+00	9.75E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	2.2676E-01						
		583.14	2.207E-01	(P	3.444E-02	1.71E-02	G
		510.72	2.501E-01	*(P	1.424E-01	5.42E-02	G
PB-212	5.8969E-01						
		238.63	5.897E-01	(P	7.397E-02	3.14E-02	G K
							Energy duplication
		77.11	5.897E-01	} P	3.302E-01	8.86E-02	G
		74.81	7.492E-01	+ P	6.510E-01	2.05E-01	G
PB-214	3.7515E-01						
		351.99	3.822E-01	(P	7.437E-02	3.33E-02	G K
		295.22	3.615E-01	(P	1.131E-01	4.18E-02	G
							Energy duplication
		77.11	3.070E-02	} P	7.862E-01	1.99E-01	G
		241.92	3.794E-03	%	5.688E-01	1.69E-01	G
BI-212	4.6897E-01						
		727.17	4.690E-01	(P	2.510E-01	9.77E-02	G K
		1620.56	3.098E-01	% P	8.252E-01	2.44E-01	G
		785.42	4.734E-01	&	1.551E+00	4.60E-01	G
BI-214	3.5414E-01						
		609.32	3.347E-01	(P	5.627E-02	2.75E-02	G K
		1764.51	4.103E-01	(P	1.222E-01	6.52E-02	G
		1120.28	4.825E-01	+ P	2.504E-01	1.02E-01	G
RA-224	7.5691E-01						
		241.00	7.569E-01	(	9.042E-01	2.79E-01	G
RA-226	7.0819E-01						
		185.99	7.082E-01	%(P	1.004E+00	3.06E-01	G
AC-228	7.0337E-01						
		911.07	6.653E-01	(P	1.034E-01	5.41E-02	G K
		968.90	1.025E+00	+ P	1.383E-01	8.44E-02	G
		338.40	7.953E-01	*(P	2.306E-01	9.61E-02	G
TH-227	-2.2209E-01						
		236.00	-2.221E-01	%(	3.541E-01	1.08E-01	G K
		256.25	-2.362E-02	& P	3.479E-01	1.02E-01	G
PA-234	7.4826E-02						
		98.44	7.483E-02	%(P	1.861E-01	5.62E-02	G K
		946.00	1.670E-02	% P	1.386E-01	3.96E-02	G
		131.28	-4.266E-02	% P	1.843E-01	5.53E-02	G
		94.67	-3.105E-02	% P	3.085E-01	9.19E-02	G
		883.24	1.238E-03	%	1.864E-01	5.13E-02	G
		926.70	1.479E-02	&	2.133E-01	5.96E-02	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26 5.818E-02 % P 2.859E-01 8.40E-02 G

TH-234       2.2876E+00
                           63.29 2.288E+00 %(P 5.679E+00 1.71E+00 G K
                           92.80 1.054E+00 % P 1.871E+00 5.66E-01 G
                           92.38 1.276E+00 & P 2.218E+00 6.72E-01 G

AM-241      -1.3480E-01
                           59.54-1.348E-01 %(P 9.694E-01 2.89E-01 G
   ( - This peak used in the nuclide activity average.

   * - Peak is too wide, but only one peak in library.
   ! - Peak is part of a multiplet and this area went
       negative during deconvolution.
   ? - Peak is too narrow.
   @ - Peak is too wide at FW25M, but ok at FWHM.
   % - Peak fails sensitivity test.
   $ - Peak identified, but first peak of this nuclide
       failed one or more qualification tests.
   + - Peak activity higher than counting uncertainty range.
   - - Peak activity lower than counting uncertainty range.
   = - Peak outside analysis energy range.
   & - Calculated peak centroid is not close enough to the
       library energy centroid for positive identification.
   P - Peakbackground subtraction
   } - Peak is too close to another for the activity
       to be found directly.

   Nuclide Codes:                      Peak Codes:
   T - Thermal Neutron Activation      G - Gamma Ray
   F - Fast Neutron Activation         X - X-Ray
   I - Fission Product                 P - Positron Decay
   N - Naturally Occurring Isotope     S - Single-Escape
   P - Photon Reaction                 D - Double-Escape
   C - Charged Particle Reaction       K - Key Line
   M - No MDA Calculation              A - Not in Average
   R - Coincidence Corrected           C - Coincidence Peak
   H - Halflife limit exceeded

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
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***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	1.1664E-01	1.1945E-01	2.4622E-01	2.4631E-01	2.653E-01
K-40		1.1543E+01	1.1543E+01	1.0721E+00	1.2643E+00	
MN-54	#A	4.3323E-03	4.3499E-03	2.7901E-02	2.7902E-02	3.200E-02
CO-57	#B	-1.0380E-02	-1.0429E-02	4.2217E-02	4.2221E-02	4.539E-02
CO-60	#B	4.6961E-03	4.6992E-03	2.6411E-02	2.6412E-02	3.147E-02

Sr-85	#A	-1.3425E-02	-1.3691E-02	3.3967E-02	3.3976E-02	3.694E-02
Kr-85	#A	-3.1001E+02	-3.1001E+02	7.6898E+02	7.6919E+02	8.528E+02
Y-88	#B	4.9157E-03	4.9746E-03	1.3445E-02	1.3448E-02	1.558E-02
NB-94	#B	1.0431E-03	1.0431E-03	1.8080E-02	1.8080E-02	2.173E-02
Ag-108M	#B	0.0000E+00	0.0000E+00	5.0868E-02	5.0868E-02	5.788E-02
CD-109	#A	6.7904E-01	6.8095E-01	1.4241E+00	1.4246E+00	1.564E+00
SN-113	#B	-2.2874E-03	-2.3128E-03	3.7027E-02	3.7027E-02	4.176E-02
SB-125	#B	8.5702E-02	8.5810E-02	6.5959E-02	6.6147E-02	8.877E-02
I-131	#B	-7.3825E-03	-8.6450E-03	3.8881E-02	3.8884E-02	3.417E-02
CS-134	#B	-5.4591E-03	-5.4683E-03	2.8166E-02	2.8168E-02	3.192E-02
CS-137	#A	5.7068E-03	5.7075E-03	2.4549E-02	2.4552E-02	2.826E-02
CE-139	#A	-9.5175E-05	-9.6057E-05	3.5387E-02	3.5387E-02	3.938E-02
EU-152	#B	-3.0927E-02	-3.0936E-02	1.2737E-01	1.2738E-01	1.332E-01
EU-154	#B	-2.1930E-02	-2.1939E-02	8.3727E-02	8.3736E-02	9.291E-02
EU-155	#B	2.0445E-02	2.0460E-02	1.6414E-01	1.6414E-01	1.832E-01
HG-203	#B	1.5740E-02	1.6175E-02	3.0861E-02	3.0875E-02	3.302E-02
TL-208		2.2676E-01	2.2676E-01	5.2810E-02	5.4427E-02	
PB-212		5.8969E-01	5.8969E-01	9.4223E-02	1.0025E-01	
PB-214		3.7515E-01	3.7515E-01	8.1459E-02	8.4320E-02	
BI-212		4.6897E-01	4.6897E-01	2.9307E-01	2.9433E-01	
BI-214		3.5414E-01	3.5414E-01	8.7181E-02	8.9573E-02	
RA-224	#A	7.5691E-01	7.5691E-01	8.3580E-01	8.3695E-01	9.042E-01
RA-226	#A	7.0819E-01	7.0819E-01	9.1804E-01	9.1896E-01	1.004E+00
AC-228		7.0337E-01	7.0337E-01	1.5371E-01	1.5904E-01	
TH-227	#B	-2.2209E-01	-2.2209E-01	3.2408E-01	3.2434E-01	3.541E-01
PA-234	#B	7.4826E-02	7.4826E-02	1.6869E-01	1.6874E-01	1.861E-01
TH-234	#B	2.2876E+00	2.2876E+00	5.1405E+00	5.1421E+00	5.679E+00
AM-241	#A	-1.3480E-01	-1.3480E-01	8.8914E-01	8.8917E-01	9.694E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (86.9 to 2000.7 keV) 1.4261306E+01 pCi/gm
Total Decayed Activity (86.9 to 2000.7 keV) 1.4261306E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JPK

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 103F_13SEPT2006_1127.An1

Sample description
FSS-OOL-05-09-012-F

Spectrum Filename: C:\GammaVision\Spectra\103F_13SEPT2006_1127.An1

Acquisition information
Start time: 13-Sep-2006 11:27:32
Live time: 2000
Real time: 2002
Dead time: 0.09 %
Detector ID: 4

Detector system
Det 103 - DSPE-471

Calibration
Filename: D3_1LSa.Clb
Detector_103 1.0 Liter Sand Geometry

Energy Calibration
Created: 08-Aug-2005 11:09:41
Zero offset: 0.409 keV
Gain: 0.500 keV/channel
Quadratic: 1.092E-08 keV/channel^2

Efficiency Calibration
Created: 08-Aug-2005 11:11:25
Type: Polynomial
Uncertainty: 0.993 %
Coefficients: -0.264059 -5.138468 0.638383
-0.089199 0.005011 -0.000129

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.41keV)
Stop channel: 4000 (2000.67keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 1.6920E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.6920E+03) =
5.9102E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	11-Sep-2006 14:31:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	103_150K_05AUG05.Pbc 08-Aug-2005 12:54:15
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 16 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.1275

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
74.92	115.	22.12	0.99	9.052E-03	74.81	9.600	1.058E+00	PB212
77.22	124.	16.93	0.99	1.011E-02	77.11	17.500	7.449E-01	PB212
					77.11	10.700	1.218E+00	PB214
115.31	90.	40.82	1.21	2.234E-02				
186.29	150.	22.85	1.18	2.566E-02	185.99	3.280	1.300E+00	RA226
238.73	822.	4.14	1.09	2.319E-02	238.63	43.100	6.468E-01	PB212
241.59	122.	18.95	1.09	2.304E-02	241.00	3.900	1.082E+00	RA224
					241.92	7.470	5.663E-01	PB214
270.80	111.	26.89	1.38	2.148E-02				
295.12	195.	13.34	1.01	2.025E-02	295.22	19.200	3.919E-01	PB214
300.29	70.	31.88	0.93	2.000E-02				
338.79	221.	12.43	1.24	1.828E-02	338.40	12.010	7.998E-01	AC228
352.02	350.	7.94	0.95	1.775E-02	351.99	37.100	4.182E-01	PB214
463.00	40.	34.46	1.24	1.426E-02				
463.00	40.	34.46	1.24	1.426E-02	463.51	10.000	PBC<MDA	SB125
510.61	143.	15.57	1.45	1.317E-02	510.72	22.500	3.135E-01	TL208
583.16	319.	8.74	1.38	1.184E-02	583.14	86.000	2.464E-01	TL208
609.42	276.	8.33	1.26	1.144E-02	609.32	46.090	4.083E-01	BI214
661.80	43.	26.00	1.63	1.072E-02	661.62	84.620	3.663E-02	CS137
726.99	68.	22.49	1.46	9.967E-03	727.17	11.800	4.619E-01	BI212
795.11	40.	28.95	1.50	9.301E-03	795.76	85.400	4.068E-02	CS134
911.24	209.	9.46	1.35	8.400E-03	911.07	29.000	6.747E-01	AC228
964.30	35.	30.80	1.54	8.054E-03	964.00	14.580	PBC<MDA	EU152
969.12	96.	13.14	1.54	8.024E-03	968.90	17.460	5.474E-01	AC228
1119.87	65.	29.65	2.10	7.212E-03	1120.28	15.040	4.809E-01	BI214
1460.85	1138.	3.09	1.91	5.932E-03	1460.75	10.700	1.409E+01	K40
1621.46	12.	36.89	1.11	5.488E-03	1620.56	2.750	6.169E-01	BI212

1764.66	47.	15.06	2.21	5.142E-03	1764.51	15.920	4.628E-01	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
229.79	115.31	504.	90.	0.045	110.46	1.208	PA-234	
540.74	270.80	287.	111.	0.055	80.68	1.382	AC-228	s
599.73	300.29	181.	70.	0.035	95.65	0.932	PB-212	s
925.11	463.00	75.	40.	0.020	103.38	1.245	AC-228	l
1928.12	964.35	38.	38.	0.019	83.71	1.538	AC-228	D

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-212	148.79	74.81	286.	115.	0.058	66.35	0.993D
PB-212	153.39	77.11	267.	124.	0.062	50.78	0.995A
RA-226	371.62	186.23	551.	126.	0.063	75.24	1.500s
PB-212	476.71	238.78	617.	771.	0.385	18.84	1.094
RA-224	482.30	241.57	630.	102.	0.051	108.09	1.500s
PB-214	589.38	295.12	204.	191.	0.095	40.02	1.009
AC-228	676.73	338.79	192.	220.	0.110	37.28	1.238s
PB-214	703.18	352.02	175.	345.	0.172	23.82	0.951
TL-208	1020.34	510.61	153.	116.	0.058	46.71	1.448s
TL-208	1165.42	583.16	125.	314.	0.157	26.23	1.382
BI-214	1217.93	609.42	96.	270.	0.135	24.98	1.257s
CS-137	1322.15	661.53	62.	47.	0.023	80.78	1.500s
BI-212	1453.06	726.99	68.	68.	0.034	67.46	1.458
CS-134	1589.29	795.11	49.	40.	0.020	86.85	1.500s
AC-228	1821.51	911.24	62.	206.	0.103	28.37	1.346s
EU-152	1928.49	964.74	66.	32.	0.016	119.36	1.538s
AC-228	1936.81	968.90	32.	96.	0.048	39.36	1.541D
BI-214	2238.71	1119.87	89.	65.	0.033	88.95	2.105s
K-40	2920.57	1460.85	44.	1119.	0.560	9.28	1.915
BI-212	3241.73	1621.46	3.	12.	0.006	110.67	1.108s
BI-214	3528.08	1764.66	6.	47.	0.024	45.18	2.214

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	MDA Value pCi/gm	COMMENTS
BE-7		1.6246E-01					
			477.56	1.625E-01	%(	2.459E-01 7.63E-02	G
K-40		1.4086E+01					
			1460.75	1.409E+01	(P	4.209E-01 4.43E-01	G
MN-54		-5.1591E-03					
			834.81	-5.159E-03	&(P	3.167E-02 9.09E-03	G
CO-57		1.5760E-02					
			122.07	1.576E-02	%(P	4.746E-02 1.43E-02	G K
			136.43	5.595E-02	&	3.674E-01 1.10E-01	G
CO-60		9.2065E-03					
			1332.51	9.206E-03	%(P	4.140E-02 1.18E-02	G K
			1173.23	2.813E-03	& P	4.463E-02 1.26E-02	G K
Sr-85		-1.3225E-02					
			514.00	-1.322E-02	%(	4.566E-02 1.36E-02	G
Kr-85		-2.9925E+02					
			513.99	-2.993E+02	%(	1.033E+03 3.09E+02	G
Y-88		-4.5879E-03					
			1836.01	-4.588E-03	%(P	3.027E-02 8.28E-03	G K
			898.02	2.895E-03	& P	4.058E-02 1.16E-02	G
NB-94		4.4486E-04					
			871.10	4.449E-04	&(	3.657E-02 1.04E-02	G K
			702.50	5.089E-03	&	2.925E-02 8.47E-03	G K
Ag-108M		-2.4100E-02					
			722.95	-2.410E-02	&(	5.134E-02 1.56E-02	G K
			614.37	-1.130E-02	% P	4.095E-02 1.21E-02	G
			433.93	1.994E-03	&	3.032E-02 8.78E-03	G
CD-109		9.1684E-02					
			88.04	9.168E-02	%(	1.962E+00 5.85E-01	G
SN-113		-5.9234E-04					
			391.71	-5.923E-04	%(	5.008E-02 1.46E-02	G K
			255.04	-4.056E-01	%	1.642E+00 4.91E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	2.3154E-02						
		427.95	2.315E-02	%(P	9.100E-02	2.69E-02	G K
		600.77	2.484E-02	% P	1.887E-01	5.50E-02	G
		636.15	8.647E-02	% P	2.279E-01	6.79E-02	G
		463.51	2.118E-01	% P	3.121E-01	9.63E-02	G
		176.29	-1.394E-01	&	4.798E-01	1.44E-01	G
I-131	1.0945E-02						
		364.48	1.094E-02	&(P	3.870E-02	1.15E-02	G K
		636.97	-1.407E-01	&	5.698E-01	1.68E-01	G
		284.29	-1.449E-01	% P	6.332E-01	1.89E-01	G
CS-134	1.8880E-02						
		604.66	-1.993E-04	%(	3.484E-02	9.99E-03	G K
		795.76	4.068E-02	(P	3.542E-02	1.18E-02	G
		569.29	-6.141E-03	% P	1.793E-01	5.03E-02	G
		801.84	-4.652E-02	% P	2.837E-01	7.78E-02	G
CS-137	4.1365E-02						
		661.62	4.136E-02	(P	3.470E-02	1.15E-02	G
CE-139	-5.9488E-03						
		165.85	-5.949E-03	&(	4.355E-02	1.30E-02	G
EU-152	1.0189E-01						
		121.78	4.540E-02	%(P	1.386E-01	4.17E-02	G K
		344.30	-3.883E-02	% P	1.259E-01	3.77E-02	G
		1408.08	4.659E-02	%	1.510E-01	4.41E-02	G
		964.00	2.152E-01	@(P	2.767E-01	8.71E-02	G
		1112.07	6.230E-02	&	2.967E-01	8.64E-02	G
		778.90	-5.620E-03	%	2.565E-01	7.28E-02	G
EU-154	1.8924E-02						
		123.10	1.892E-02	&(	9.246E-02	2.77E-02	G K
		1274.80	-1.652E-02	&	1.328E-01	3.82E-02	G
		723.30	-8.968E-02	%	2.409E-01	7.23E-02	G
		1004.80	1.686E-03	&	2.055E-01	5.77E-02	G
EU-155	1.0564E-01						
		86.45	1.056E-01	%(	2.259E-01	6.85E-02	G K
		105.31	7.429E-02	%	2.186E-01	6.59E-02	G
HG-203	1.9763E-02						
		279.17	1.976E-02	&(P	3.610E-02	1.10E-02	G K
		72.87	-3.349E-01	% P	2.173E+00	6.50E-01	G
		70.83	-1.038E+00	&	4.275E+00	1.28E+00	G
		82.50	-1.636E+00	%	3.869E+00	1.17E+00	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments

TL-208       2.4642E-01
                          583.14 2.464E-01  (P 4.293E-02 2.18E-02 G
                          510.72 3.135E-01 + P 1.625E-01 6.00E-02 G

PB-212       6.1573E-01
                          238.63 6.157E-01  (P 9.464E-02 3.93E-02 G K
                                                          Energy duplication
                           77.11 5.592E-01 } P 3.558E-01 9.47E-02 G
                           74.81 1.058E+00 + P 7.491E-01 2.40E-01 G

PB-214       4.0921E-01
                          351.99 4.182E-01  (P 7.807E-02 3.37E-02 G K
                          295.22 3.919E-01  (P 1.424E-01 5.34E-02 G
                                                          Energy duplication
                           77.11 1.029E-01 } P 8.739E-01 2.11E-01 G
                          241.92-3.361E-02 %   6.633E-01 1.98E-01 G

BI-212       4.9120E-01
                          727.17 4.619E-01  (P 2.794E-01 1.05E-01 G K
                         1620.56 6.169E-01  (P 5.945E-01 2.29E-01 G
                          785.42 8.586E-01 %   1.594E+00 4.88E-01 G

BI-214       4.3371E-01
                          609.32 4.083E-01 @(P 7.344E-02 3.48E-02 G K
                         1764.51 4.628E-01  (P 1.338E-01 7.45E-02 G
                         1120.28 4.809E-01  (P 3.431E-01 1.47E-01 G

RA-224       9.0920E-01
                          241.00 9.092E-01  (  1.062E+00 3.28E-01 G

RA-226       1.1953E+00
                          185.99 1.195E+00 *(P 1.063E+00 3.31E-01 G

AC-228       7.1137E-01
                          911.07 6.747E-01 @(P 1.293E-01 6.49E-02 G K
                          968.90 5.481E-01 - P 1.653E-01 7.20E-02 G
                          338.40 7.998E-01 @(P 2.444E-01 9.99E-02 G

TH-227      -9.7264E-02
                          236.00-9.726E-02 %(  3.262E-01 9.80E-02 G K
                          256.25-1.315E-01 % P 4.984E-01 1.49E-01 G

PA-234      -5.4318E-03
                           98.44-5.432E-03 &(P 2.186E-01 6.49E-02 G K
                          946.00-1.032E-04 % P 2.504E-01 7.20E-02 G
                          131.28-4.578E-02 % P 2.046E-01 6.13E-02 G
                           94.67-1.405E-01 % P 3.864E-01 1.17E-01 G
                          883.24 5.194E-02 %   2.809E-01 8.14E-02 G
                          926.70-2.310E-03 %   2.665E-01 7.38E-02 G
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 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26-4.551E-03 % P 3.081E-01 8.77E-02 G

TH-234       2.1090E-01
                           63.29 2.109E-01 %(P 6.405E+00 1.90E+00 G K
                           92.80 7.969E-01 % P 2.109E+00 6.33E-01 G
                           92.38 9.819E-01 % P 2.489E+00 7.48E-01 G

AM-241       2.8043E-01
                           59.54 2.804E-01 %(P 1.073E+00 3.22E-01 G
   ( - This peak used in the nuclide activity average.

   * - Peak is too wide, but only one peak in library.
   ! - Peak is part of a multiplet and this area went
       negative during deconvolution.
   ? - Peak is too narrow.
   @ - Peak is too wide at FW25M, but ok at FWHM.
   % - Peak fails sensitivity test.
   $ - Peak identified, but first peak of this nuclide
       failed one or more qualification tests.
   + - Peak activity higher than counting uncertainty range.
   - - Peak activity lower than counting uncertainty range.
   = - Peak outside analysis energy range.
   & - Calculated peak centroid is not close enough to the
       library energy centroid for positive identification.
   P - Peakbackground subtraction
   } - Peak is too close to another for the activity
       to be found directly.

   Nuclide Codes:                      Peak Codes:
   T - Thermal Neutron Activation      G - Gamma Ray
   F - Fast Neutron Activation         X - X-Ray
   I - Fission Product                 P - Positron Decay
   N - Naturally Occurring Isotope     S - Single-Escape
   P - Photon Reaction                 D - Double-Escape
   C - Charged Particle Reaction       K - Key Line
   M - No MDA Calculation              A - Not in Average
   R - Coincidence Corrected           C - Coincidence Peak
   H - Halflife limit exceeded

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
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***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	1.5856E-01	1.6246E-01	2.2885E-01	2.2905E-01	2.400E-01
K-40		1.4086E+01	1.4086E+01	1.3292E+00	1.5607E+00	
MN-54	#A	-5.1377E-03	-5.1591E-03	3.0861E-02	3.0862E-02	3.154E-02
CO-57	#B	1.5685E-02	1.5760E-02	4.2879E-02	4.2888E-02	4.723E-02
CO-60	#B	9.2003E-03	9.2065E-03	3.5532E-02	3.5536E-02	4.137E-02

Sr-85	#A	-1.2963E-02	-1.3225E-02	4.0949E-02	4.0956E-02	4.476E-02
Kr-85	#A	-2.9925E+02	-2.9925E+02	9.2661E+02	9.2677E+02	1.033E+03
Y-88	#B	-4.5323E-03	-4.5879E-03	2.5973E-02	2.5975E-02	2.991E-02
NB-94	#B	4.4486E-04	4.4486E-04	3.1088E-02	3.1088E-02	3.657E-02
Ag-108M	#B	-2.4099E-02	-2.4100E-02	4.6667E-02	4.6688E-02	5.134E-02
CD-109	#A	9.1422E-02	9.1684E-02	1.7542E+00	1.7542E+00	1.956E+00
SN-113	#B	-5.8569E-04	-5.9234E-04	4.3737E-02	4.3737E-02	4.952E-02
SB-125	#B	2.3124E-02	2.3154E-02	8.0787E-02	8.0798E-02	9.089E-02
I-131	#B	9.3131E-03	1.0945E-02	3.4510E-02	3.4516E-02	3.293E-02
CS-134	#B	1.8847E-02	1.8880E-02	1.6432E-02	1.6468E-02	3.478E-02
CS-137	#	4.1360E-02	4.1365E-02	3.4400E-02	3.4484E-02	3.469E-02
CE-139	#A	-5.8930E-03	-5.9488E-03	3.8960E-02	3.8961E-02	4.314E-02
EU-152	#B	1.0186E-01	1.0189E-01	1.2371E-01	1.2384E-01	1.386E-01
EU-154	#B	1.8916E-02	1.8924E-02	8.2978E-02	8.2984E-02	9.242E-02
EU-155	#B	1.0557E-01	1.0564E-01	2.0549E-01	2.0557E-01	2.258E-01
HG-203	#B	1.9220E-02	1.9763E-02	3.3001E-02	3.3021E-02	3.511E-02
TL-208		2.4642E-01	2.4642E-01	6.5528E-02	6.7072E-02	
PB-212		6.1573E-01	6.1573E-01	1.1781E-01	1.2311E-01	
PB-214		4.0921E-01	4.0921E-01	9.7188E-02	1.0005E-01	
BI-212		4.9120E-01	4.9120E-01	3.1984E-01	3.2111E-01	
BI-214		4.3371E-01	4.3371E-01	1.1093E-01	1.1375E-01	
RA-224	#A	9.0920E-01	9.0920E-01	9.8280E-01	9.8421E-01	1.062E+00
RA-226	#	1.1953E+00	1.1953E+00	9.9180E-01	9.9423E-01	1.063E+00
AC-228		7.1137E-01	7.1137E-01	1.6815E-01	1.7315E-01	
TH-227	#B	-9.7264E-02	-9.7264E-02	2.9399E-01	2.9404E-01	3.262E-01
PA-234	#B	-5.4318E-03	-5.4318E-03	3.7597E-01	3.7597E-01	2.186E-01
TH-234	#B	2.1090E-01	2.1090E-01	5.6923E+00	5.6923E+00	6.405E+00
AM-241	#A	2.8042E-01	2.8043E-01	9.6511E-01	9.6524E-01	1.073E+00

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (1120.0 to 2000.7 keV) 1.6993992E+01 pCi/gm
Total Decayed Activity (1120.0 to 2000.7 keV) 1.6993992E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JPK

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 103F_13SEPT2006_1329.An1

Sample description
FSS-OOL-05-09-002-F

Spectrum Filename: C:\GammaVision\Spectra\103F_13SEPT2006_1329.An1

Acquisition information
Start time: 13-Sep-2006 13:29:17
Live time: 2000
Real time: 2002
Dead time: 0.08 %
Detector ID: 4

Detector system
Det 103 - DSPE-471

Calibration
Filename: D3_1LSa.Clb
Detector_103 1.0 Liter Sand Geometry

Energy Calibration
Created: 08-Aug-2005 11:09:41
Zero offset: 0.409 keV
Gain: 0.500 keV/channel
Quadratic: 1.092E-08 keV/channel^2

Efficiency Calibration
Created: 08-Aug-2005 11:11:25
Type: Polynomial
Uncertainty: 0.993 %
Coefficients: -0.264059 -5.138468 0.638383
-0.089199 0.005011 -0.000129

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.41keV)
Stop channel: 4000 (2000.67keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 1.7700E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.7700E+03) =
5.6497E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	11-Sep-2006 14:04:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	103_150K_05AUG05.Pbc 08-Aug-2005 12:54:15
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 13 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.1051

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
74.84	75.	29.53	0.99	9.052E-03	74.81	9.600	6.577E-01	PB212
77.14	117.	15.66	0.99	1.011E-02	77.11	10.700	8.497E-01	PB214
					77.11	17.500	5.195E-01	PB212
93.13	73.	40.49	1.50	1.631E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
186.38	108.	30.29	1.10	2.565E-02	185.99	3.280	PBC<MDA	RA226
209.69	103.	31.79	1.44	2.469E-02				
238.72	663.	4.57	1.09	2.319E-02	238.63	43.100	4.971E-01	PB212
241.72	111.	18.69	1.09	2.303E-02	241.00	3.900	9.446E-01	RA224
					241.92	7.470	4.942E-01	PB214
270.29	55.	40.52	0.99	2.151E-02				
295.09	216.	14.30	0.94	2.025E-02	295.22	19.200	4.162E-01	PB214
300.14	38.	41.21	0.70	2.001E-02				
328.25	62.	33.32	1.43	1.873E-02				
338.57	140.	18.08	0.90	1.829E-02	338.40	12.010	4.818E-01	AC228
351.91	325.	9.53	1.25	1.776E-02	351.99	37.100	3.702E-01	PB214
462.49	60.	25.50	0.84	1.427E-02				
462.49	60.	25.50	0.84	1.427E-02	463.51	10.000	3.130E-01	SB125
510.72	171.	13.06	1.75	1.317E-02	510.72	22.500	3.718E-01	TL208
583.17	263.	10.22	1.45	1.184E-02	583.14	86.000	1.936E-01	TL208
609.33	265.	9.74	1.43	1.144E-02	609.32	46.090	3.747E-01	BI214
726.88	70.	24.65	1.00	9.968E-03	727.17	11.800	4.513E-01	BI212
794.80	36.	38.63	1.39	9.310E-03				
794.80	36.	38.63	1.39	9.310E-03	795.76	85.400	PBC<MDA	CS134
911.23	145.	10.34	1.87	8.400E-03	911.07	29.000	4.451E-01	AC228
969.08	80.	16.81	1.61	8.025E-03	968.90	17.460	4.351E-01	AC228
1120.13	66.	19.90	1.14	7.212E-03	1120.28	15.040	4.541E-01	BI214

1460.86	1030.	3.15	2.06	5.932E-03	1460.75	10.700	1.216E+01	K40
1620.80	12.	31.68	0.61	5.488E-03	1620.56	2.750	5.998E-01	BI212
1764.83	40.	15.25	1.87	5.142E-03	1764.51	15.920	3.705E-01	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
418.54	209.69	371.	103.	0.051	95.37	1.436	NP-239	s
539.72	270.29	199.	55.	0.027	121.56	0.986	AC-228	
599.42	300.14	112.	38.	0.019	123.64	0.701	PB-212	s
655.64	328.25	148.	62.	0.031	99.97	1.427	AC-228	s
1588.66	794.80	54.	40.	0.020	91.21	1.390	AC-228	s

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-212	148.79	74.81	229.	75.	0.037	88.60	0.993D
PB-212	153.39	77.11	250.	117.	0.058	46.97	0.995A
RA-226	371.61	186.22	461.	100.	0.050	84.45	1.500s
PB-212	476.76	238.80	462.	652.	0.326	19.33	1.127
RA-224	482.46	241.65	492.	91.	0.045	108.58	1.500
PB-214	589.32	295.09	250.	212.	0.106	42.90	0.937s
AC-228	676.28	338.57	179.	139.	0.069	54.24	0.898
PB-214	702.96	351.91	204.	319.	0.160	28.58	1.255
SB-125	924.91	462.89	70.	51.	0.026	78.59	1.500
TL-208	1020.56	510.72	118.	144.	0.072	39.17	1.754s
TL-208	1165.44	583.17	125.	258.	0.129	30.66	1.454s
BI-214	1217.76	609.33	118.	259.	0.129	29.23	1.426
BI-212	1452.83	726.88	69.	70.	0.035	73.95	0.996s
AC-228	1821.48	911.23	37.	142.	0.071	31.02	1.873s
AC-228	1937.18	969.08	42.	80.	0.040	50.42	1.606
BI-214	2239.24	1120.13	43.	65.	0.032	59.69	1.144s
K-40	2920.60	1460.86	25.	1011.	0.506	9.46	2.059
BI-212	3240.40	1620.80	1.	12.	0.006	95.03	0.608s
BI-214	3528.42	1764.83	3.	40.	0.020	45.75	1.867

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	MDA Value pCi/gm	COMMENTS
BE-7		1.5009E-01					
			477.56	1.501E-01	%(	2.779E-01 8.48E-02	G
K-40		1.2162E+01					
			1460.75	1.216E+01	(P	3.124E-01 3.91E-01	G
MN-54		4.7238E-03					
			834.81	4.724E-03	%(P	3.080E-02 8.86E-03	G
CO-57		7.9286E-03					
			122.07	7.929E-03	%(P	4.047E-02 1.21E-02	G K
			136.43	3.271E-03	%	3.232E-01 9.58E-02	G
CO-60		-5.5135E-04					
			1332.51	-5.514E-04	%(P	3.357E-02 8.95E-03	G K
			1173.23	1.282E-02	% P	4.398E-02 1.29E-02	G K
Sr-85		-6.9625E-03					
			514.00	-6.962E-03	%(	3.337E-02 9.85E-03	G
Kr-85		-1.5841E+02					
			513.99	-1.584E+02	%(	7.544E+02 2.23E+02	G
Y-88		5.9718E-03					
			1836.01	5.972E-03	&(P	2.129E-02 6.00E-03	G K
			898.02	-6.119E-04	% P	3.858E-02 1.09E-02	G
NB-94		7.9073E-03					
			871.10	7.907E-03	%(	2.882E-02 8.44E-03	G K
			702.50	-4.030E-03	&	2.930E-02 8.46E-03	G K
Ag-108M		-5.9558E-03					
			722.95	-5.956E-03	%(	3.808E-02 1.11E-02	G K
			614.37	-9.222E-03	% P	3.540E-02 1.05E-02	G
			433.93	6.017E-04	%	3.655E-02 1.06E-02	G
CD-109		5.5584E-01					
			88.04	5.558E-01	&(	1.578E+00 4.76E-01	G
SN-113		0.0000E+00					
			391.71	0.000E+00	%(	4.847E-02 1.41E-02	G K
			255.04	4.010E-01	%	1.315E+00 3.94E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	6.8830E-02						
		427.95	-7.948E-04	&(P	9.488E-02	2.74E-02	G K
		600.77	-1.467E-04	% P	1.194E-01	3.33E-02	G
		636.15	-1.964E-02	% P	2.836E-01	8.13E-02	G
		463.51	2.749E-01	(P	2.232E-01	7.38E-02	G
		176.29	-7.705E-02	%	5.095E-01	1.52E-01	G
I-131	-2.6771E-03						
		364.48	-2.677E-03	%(P	3.830E-02	1.11E-02	G K
		636.97	-1.057E-02	%	4.879E-01	1.39E-01	G
		284.29	-2.479E-02	& P	5.173E-01	1.52E-01	G
CS-134	6.6001E-03						
		604.66	6.600E-03	&(	2.043E-02	6.02E-03	G K
		795.76	-3.562E-03	% P	4.000E-02	1.15E-02	G
		569.29	-4.394E-02	% P	2.038E-01	5.93E-02	G
		801.84	-4.819E-02	% P	3.753E-01	1.06E-01	G
CS-137	1.1504E-02						
		661.62	1.150E-02	%(P	4.107E-02	1.21E-02	G
CE-139	7.0790E-03						
		165.85	7.079E-03	&(	3.931E-02	1.17E-02	G
EU-152	2.4851E-02						
		121.78	2.485E-02	%(P	1.140E-01	3.41E-02	G K
		344.30	-1.670E-02	% P	1.070E-01	3.16E-02	G
		1408.08	8.043E-02	&	1.401E-01	4.35E-02	G
		964.00	9.175E-02	% P	2.536E-01	7.55E-02	G
		1112.07	1.056E-01	%	2.790E-01	8.33E-02	G
		778.90	5.839E-02	&	1.744E-01	5.15E-02	G
EU-154	2.0856E-02						
		123.10	2.086E-02	%(	8.578E-02	2.57E-02	G K
		1274.80	0.000E+00	&	1.158E-01	3.24E-02	G
		723.30	-6.918E-03	%	1.252E-01	3.52E-02	G
		1004.80	0.000E+00	%	2.073E-01	5.83E-02	G
EU-155	-7.0448E-03						
		86.45	-7.045E-03	&(	2.131E-01	6.34E-02	G K
		105.31	4.635E-03	%	1.507E-01	4.44E-02	G
HG-203	-1.2289E-03						
		279.17	-1.229E-03	%(P	3.819E-02	1.12E-02	G K
		72.87	-6.339E-01	% P	1.902E+00	5.73E-01	G
		70.83	6.629E-02	&	4.031E+00	1.20E+00	G
		82.50	-7.947E-02	&	3.322E+00	9.86E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	1.9359E-01						
		583.14	1.936E-01	*(P	4.103E-02	2.01E-02	G
		510.72	3.718E-01	+ P	1.372E-01	5.75E-02	G
PB-212	5.0435E-01						
		238.63	4.982E-01	(P	7.852E-02	3.27E-02	G K
							Energy duplication
		77.11	5.043E-01	} P	3.292E-01	7.90E-02	G
		74.81	6.577E-01	+ P	6.436E-01	2.02E-01	G
PB-214	3.8589E-01						
		351.99	3.702E-01	(P	8.023E-02	3.59E-02	G K
		295.22	4.162E-01	@(P	1.500E-01	6.06E-02	G
							Energy duplication
		77.11	0.000E+00	} P	7.865E-01	0.00E+00	G
		241.92	1.931E-01	%	4.875E-01	1.47E-01	G
BI-212	4.7937E-01						
		727.17	4.513E-01	@(P	2.698E-01	1.12E-01	G K
		1620.56	5.998E-01	(P	3.893E-01	1.91E-01	G
		785.42	6.373E-01	%	1.416E+00	4.28E-01	G
BI-214	3.8931E-01						
		609.32	3.747E-01	(P	7.731E-02	3.74E-02	G K
		1764.51	3.705E-01	(P	1.039E-01	6.12E-02	G
		1120.28	4.541E-01	*(P	2.354E-01	9.30E-02	G
RA-224	7.6870E-01						
		241.00	7.687E-01	(	9.003E-01	2.78E-01	G
RA-226	9.0552E-01						
		185.99	9.055E-01	(P	9.317E-01	2.88E-01	G
AC-228	4.4964E-01						
		911.07	4.451E-01	(P	9.728E-02	4.71E-02	G K
		968.90	4.351E-01	(P	1.796E-01	7.33E-02	G
		338.40	4.818E-01	(P	2.262E-01	8.78E-02	G
TH-227	-3.2237E-02						
		236.00	-3.224E-02	%(	3.187E-01	9.48E-02	G K
		256.25	1.255E-01	% P	3.959E-01	1.19E-01	G
PA-234	4.2689E-02						
		98.44	4.269E-02	%(P	1.915E-01	5.74E-02	G K
		946.00	4.127E-02	& P	1.381E-01	4.05E-02	G
		131.28	-1.698E-02	& P	1.860E-01	5.54E-02	G
		94.67	-9.391E-02	% P	3.682E-01	1.11E-01	G
		883.24	1.039E-02	%	2.292E-01	6.41E-02	G
		926.70	-3.363E-02	%	2.940E-01	8.40E-02	G

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 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26-6.425E-02 % P 3.016E-01 8.77E-02 G

TH-234       2.0695E+00
                           63.29 2.070E+00 %(P 5.410E+00 1.63E+00 G K
                           92.80 1.052E+00 % P 1.866E+00 5.64E-01 G
                           92.38 1.336E+00 % P 2.214E+00 6.71E-01 G

AM-241      -1.1364E-01
                           59.54-1.136E-01 %(P 9.701E-01 2.88E-01 G
   ( - This peak used in the nuclide activity average.

   * - Peak is too wide, but only one peak in library.
   ! - Peak is part of a multiplet and this area went
       negative during deconvolution.
   ? - Peak is too narrow.
   @ - Peak is too wide at FW25M, but ok at FWHM.
   % - Peak fails sensitivity test.
   $ - Peak identified, but first peak of this nuclide
       failed one or more qualification tests.
   + - Peak activity higher than counting uncertainty range.
   - - Peak activity lower than counting uncertainty range.
   = - Peak outside analysis energy range.
   & - Calculated peak centroid is not close enough to the
       library energy centroid for positive identification.
   P - Peakbackground subtraction
   } - Peak is too close to another for the activity
       to be found directly.

   Nuclide Codes:                      Peak Codes:
   T - Thermal Neutron Activation      G - Gamma Ray
   F - Fast Neutron Activation         X - X-Ray
   I - Fission Product                 P - Positron Decay
   N - Naturally Occurring Isotope     S - Single-Escape
   P - Photon Reaction                 D - Double-Escape
   C - Charged Particle Reaction       K - Key Line
   M - No MDA Calculation              A - Not in Average
   R - Coincidence Corrected           C - Coincidence Peak
   H - Halflife limit exceeded

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
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***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	1.4629E-01	1.5009E-01	2.5444E-01	2.5459E-01	2.708E-01
K-40		1.2162E+01	1.2162E+01	1.1722E+00	1.3684E+00	
MN-54	#A	4.7031E-03	4.7238E-03	2.6576E-02	2.6577E-02	3.066E-02
CO-57	#B	7.8885E-03	7.9286E-03	3.6275E-02	3.6278E-02	4.027E-02
CO-60	#B	-5.5096E-04	-5.5135E-04	3.8090E-02	3.8090E-02	3.355E-02

Sr-85	#A	-6.8170E-03	-6.9625E-03	2.9545E-02	2.9547E-02	3.267E-02
Kr-85	#A	-1.5841E+02	-1.5841E+02	6.6807E+02	6.6813E+02	7.544E+02
Y-88	#B	5.8955E-03	5.9718E-03	1.7991E-02	1.7994E-02	2.102E-02
NB-94	#B	7.9073E-03	7.9073E-03	2.5332E-02	2.5336E-02	2.882E-02
Ag-108M	#B	-5.9556E-03	-5.9558E-03	3.3273E-02	3.3275E-02	3.808E-02
CD-109	#A	5.5416E-01	5.5584E-01	1.4271E+00	1.4274E+00	1.573E+00
SN-113	#B	0.0000E+00	0.0000E+00	4.2312E-02	4.2312E-02	4.790E-02
SB-125	#B	6.8737E-02	6.8830E-02	5.5440E-02	5.5584E-02	9.476E-02
I-131	#B	-2.2578E-03	-2.6771E-03	4.6576E-02	4.6576E-02	3.230E-02
CS-134	#B	6.5881E-03	6.6001E-03	1.8072E-02	1.8076E-02	2.039E-02
CS-137	#A	1.1503E-02	1.1504E-02	3.6407E-02	3.6413E-02	4.107E-02
CE-139	#A	7.0088E-03	7.0790E-03	3.5211E-02	3.5213E-02	3.892E-02
EU-152	#B	2.4844E-02	2.4851E-02	1.0225E-01	1.0226E-01	1.140E-01
EU-154	#B	2.0847E-02	2.0856E-02	7.7102E-02	7.7111E-02	8.574E-02
EU-155	#B	-7.0394E-03	-7.0448E-03	1.9019E-01	1.9019E-01	2.129E-01
HG-203	#B	-1.1933E-03	-1.2289E-03	3.4690E-02	3.4690E-02	3.708E-02
TL-208	#	1.9359E-01	1.9359E-01	6.0339E-02	6.1376E-02	
PB-212		5.0435E-01	5.0435E-01	9.9298E-02	1.0353E-01	
PB-214		3.8589E-01	3.8589E-01	1.0132E-01	1.0376E-01	
BI-212		4.7937E-01	4.7937E-01	2.9006E-01	2.9139E-01	
BI-214		3.8931E-01	3.8931E-01	1.0954E-01	1.1185E-01	
RA-224	#A	7.6870E-01	7.6870E-01	8.3468E-01	8.3587E-01	9.003E-01
RA-226	#A	9.0552E-01	9.0552E-01	8.6392E-01	8.6551E-01	9.317E-01
AC-228		4.4964E-01	4.4964E-01	1.2128E-01	1.2406E-01	
TH-227	#B	-3.2237E-02	-3.2237E-02	2.8447E-01	2.8447E-01	3.187E-01
PA-234	#B	4.2689E-02	4.2689E-02	1.7206E-01	1.7208E-01	1.915E-01
TH-234	#B	2.0695E+00	2.0695E+00	4.8837E+00	4.8850E+00	5.410E+00
AM-241	#A	-1.1364E-01	-1.1364E-01	8.9418E-01	8.9420E-01	9.701E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (87.4 to 2000.7 keV) 1.4563859E+01 pCi/gm
Total Decayed Activity (87.4 to 2000.7 keV) 1.4563859E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JPK

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 107_11SEPT2006_1622.An1

Sample description
OOL-05-09-007-F-S WET

Spectrum Filename: C:\GammaVision\Spectra\107_11SEPT2006_1622.An1

Acquisition information
Start time: 11-Sep-2006 16:22:41
Live time: 2000
Real time: 2003
Dead time: 0.17 %
Detector ID: 2

Detector system
Det 107- DSPE- 634

Calibration
Filename: D7_1LSa.Clb
Detector 107 Calibration for 1 Liter Sand Marinelli

Energy Calibration
Created: 29-Oct-2004 06:48:53
Zero offset: 0.157 keV
Gain: 0.500 keV/channel
Quadratic: -1.676E-08 keV/channel^2

Efficiency Calibration
Created: 29-Oct-2004 06:51:32
Type: Polynomial
Uncertainty: 1.174 %
Coefficients: -0.279532 -4.778179 0.614896
-0.087174 0.005356 -0.000131

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.16keV)
Stop channel: 4000 (2000.15keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 2.0730E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 2.0730E+03) =
4.8239E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	11-Sep-2006 14:17:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	107_150K_28APR05.Pbc 01-May-2005 05:30:33
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 20 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.1263

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
74.72	305.	14.63	1.18	2.849E-02	74.81	9.600	7.275E-01	PB212
77.02	402.	10.17	1.18	2.957E-02	77.11	10.700	8.932E-01	PB214
					77.11	17.500	5.521E-01	PB212
83.67	81.	39.06	0.00	3.202E-02				
92.97	172.	29.98	1.79	3.442E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
					94.67	15.500	2.076E-01	PA234
185.72	244.	21.45	1.56	3.612E-02	185.99	3.280	1.344E+00	RA226
209.28	150.	27.51	2.15	3.429E-02				
239.03	1660.	4.08	1.87	3.186E-02	238.63	43.100	7.795E-01	PB212
242.03	182.	20.87	1.30	3.163E-02	241.00	3.900	9.617E-01	RA224
					241.92	7.470	5.033E-01	PB214
270.57	141.	24.92	1.37	2.942E-02				
295.31	288.	11.97	2.05	2.767E-02	295.22	19.200	3.471E-01	PB214
338.42	314.	11.63	1.29	2.500E-02	338.40	12.010	6.747E-01	AC228
352.03	608.	6.02	1.88	2.426E-02	351.99	37.100	4.367E-01	PB214
462.49	85.	26.61	1.68	1.956E-02				
462.49	85.	26.61	1.68	1.956E-02	463.51	10.000	2.737E-01	SB125
510.33	208.	15.73	2.40	1.809E-02	510.72	22.500	2.790E-01	TL208
583.38	454.	7.30	2.35	1.628E-02	583.14	86.000	2.093E-01	TL208
609.35	451.	8.62	1.96	1.574E-02	609.32	46.090	4.015E-01	BI214
727.44	126.	14.38	1.82	1.374E-02	727.17	11.800	5.013E-01	BI212
911.48	314.	8.38	2.57	1.160E-02	911.07	29.000	5.989E-01	AC228
965.27	56.	31.31	1.80	1.112E-02				
969.01	167.	11.50	1.80	1.109E-02	968.90	17.460	5.548E-01	AC228
1120.29	130.	20.19	2.66	9.970E-03	1120.28	15.040	5.639E-01	BI214
1460.92	1817.	2.45	2.52	8.190E-03	1460.75	10.700	1.348E+01	K40

1620.03	29.	30.30	1.28	7.569E-03	1620.56	2.750	9.113E-01	BI212
1764.14	111.	10.93	2.64	7.084E-03	1764.51	15.920	6.434E-01	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
418.20	209.28	621.	150.	0.075	82.52	2.148	AC-228	s
540.76	270.57	419.	141.	0.070	74.75	1.371	AC-228	s
1931.06	965.63	136.	46.	0.023	115.21	1.797	TB-160	D

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-212	149.29	74.81	873.	305.	0.153	43.90	1.178D
PB-212	153.89	77.11	942.	402.	0.201	30.52	1.179A
TH-234	186.32	93.33	1545.	167.	0.084	91.31	1.500s
PA-234	186.30	93.32	1248.	168.	0.084	92.11	1.500s
RA-226	371.08	185.72	893.	244.	0.122	64.35	1.557s
TH-227	471.40	235.88	1651.	-178.	-0.089	99.71	1.500s
PB-212	476.89	238.63	571.	1029.	0.515	13.33	1.297D
PB-214	483.47	241.92	646.	182.	0.091	62.61	1.299D
PB-214	590.24	295.31	363.	283.	0.141	35.90	2.050s
AC-228	676.45	338.42	343.	311.	0.155	34.90	1.295s
PB-214	703.66	352.03	266.	603.	0.301	18.05	1.879s
SB-125	925.87	463.14	173.	72.	0.036	81.82	1.500s
TL-208	1020.26	510.33	273.	174.	0.087	47.20	2.399s
TL-208	1166.34	583.38	194.	450.	0.225	21.89	2.347s
BI-214	1218.28	609.35	257.	447.	0.223	25.86	1.962s
BI-212	1454.44	727.44	82.	125.	0.062	43.15	1.818s
AC-228	1822.52	911.48	112.	309.	0.155	25.13	2.574s
AC-228	1937.36	968.90	107.	167.	0.083	34.54	1.799D
BI-214	2240.14	1120.29	135.	130.	0.065	60.56	2.659s
K-40	2921.44	1460.92	41.	1812.	0.906	7.35	2.516s
BI-212	3239.68	1620.03	13.	29.	0.015	90.90	1.282s
BI-214	3527.93	1764.14	9.	111.	0.056	32.79	2.638

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	Peak MDA Value pCi/gm	COMMENTS
BE-7		2.9297E-02					
			477.56	2.930E-02	&(	1.849E-01 5.43E-02	G
K-40		1.3479E+01					
			1460.75	1.348E+01	*(P	2.414E-01 3.31E-01	G
MN-54		1.2116E-04					
			834.81	1.212E-04	%(P	2.478E-02 7.08E-03	G
CO-57		2.2870E-03					
			122.07	2.287E-03	&(P	2.898E-02 8.65E-03	G K
			136.43	4.200E-04	% P	2.671E-01 7.97E-02	G
CO-60		-6.0277E-03					
			1332.51	-6.028E-03	%(P	2.702E-02 7.47E-03	G K
			1173.23	-4.325E-04	% P	4.113E-02 1.18E-02	G K
Sr-85		-1.4435E-02					
			514.00	-1.444E-02	&(	3.171E-02 9.60E-03	G
Kr-85		-3.5817E+02					
			513.99	-3.582E+02	&(P	7.345E+02 2.21E+02	G
Y-88		-1.8122E-03					
			1836.01	-1.812E-03	%(P	1.345E-02 3.22E-03	G K
			898.02	9.661E-04	% P	2.392E-02 6.78E-03	G
NB-94		-3.7930E-03					
			871.10	-3.793E-03	%(P	2.505E-02 7.29E-03	G K
			702.50	-2.464E-04	% P	2.843E-02 8.23E-03	G K
Ag-108M		-2.0279E-04					
			722.95	-2.028E-04	&(	3.072E-02 8.90E-03	G K
			614.37	-1.839E-02	%	3.594E-02 1.09E-02	G
			433.93	-2.465E-03	% P	2.385E-02 6.97E-03	G
CD-109		1.7448E-02					
			88.04	1.745E-02	%(P	8.489E-01 2.54E-01	G
SN-113		7.8342E-03					
			391.71	7.834E-03	&(P	3.259E-02 9.68E-03	G K
			255.04	-7.978E-02	&	1.142E+00 3.39E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	6.4260E-02						
		427.95	4.885E-03	&(P	7.488E-02	2.19E-02	G K
		600.77	-1.089E-02	% P	1.333E-01	3.87E-02	G
		636.15	-1.956E-02	& P	2.235E-01	6.51E-02	G
		463.51	2.400E-01	(P	2.137E-01	6.80E-02	G
		176.29	5.354E-02	% P	3.911E-01	1.17E-01	G
I-131	-1.4964E-03						
		364.48	-1.496E-03	%(	2.104E-02	6.15E-03	G K
		636.97	-2.016E-02	&	3.364E-01	9.78E-02	G
		284.29	5.675E-02	%	3.887E-01	1.16E-01	G
CS-134	-7.2432E-03						
		604.66	-7.243E-03	%(P	2.802E-02	8.32E-03	G K
		795.76	2.091E-02	% P	3.080E-02	9.52E-03	G
		569.29	-4.289E-02	%	1.594E-01	4.74E-02	G
		801.84	-2.579E-02	& P	3.374E-01	9.82E-02	G
CS-137	8.5075E-03						
		661.62	8.508E-03	%(P	3.055E-02	9.04E-03	G
CE-139	-7.7513E-04						
		165.85	-7.751E-04	%(P	2.698E-02	8.02E-03	G
EU-152	9.7203E-03						
		121.78	9.720E-03	%(P	9.296E-02	2.78E-02	G K
		344.30	2.987E-04	% P	8.469E-02	2.49E-02	G
		1408.08	3.007E-02	% P	9.988E-02	2.91E-02	G
		964.00	-6.392E-02	& P	1.921E-01	5.72E-02	G
		1112.07	2.083E-02	% P	2.465E-01	7.15E-02	G
		778.90	6.052E-03	% P	1.902E-01	5.47E-02	G
EU-154	8.9086E-04						
		123.10	8.909E-04	&(P	5.712E-02	1.70E-02	G K
		1274.80	-1.053E-02	% P	8.306E-02	2.39E-02	G
		723.30	-6.689E-02	& P	1.648E-01	4.96E-02	G
		1004.80	4.137E-02	& P	1.585E-01	4.68E-02	G
EU-155	5.9844E-02						
		86.45	5.984E-02	%(	1.176E-01	3.57E-02	G K
		105.31	2.424E-02	% P	1.310E-01	3.93E-02	G
HG-203	5.2804E-04						
		279.17	5.280E-04	%(P	2.609E-02	7.69E-03	G K
		72.87	-2.984E-01	% P	8.665E-01	2.62E-01	G
		70.83	-8.227E-01	%	1.412E+00	4.30E-01	G
		82.50	-5.769E-01	%	1.705E+00	5.15E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	2.0933E-01						
		583.14	2.093E-01	*(P	3.147E-02	1.54E-02	G
		510.72	2.790E-01	+ P	1.277E-01	5.24E-02	G
PB-212	5.0657E-01						
		238.63	4.881E-01	(P	5.408E-02	2.20E-02	G K
							Energy duplication
		77.11	5.066E-01	}	1.835E-01	5.15E-02	G
		74.81	7.275E-01	+ P	3.345E-01	1.08E-01	G
PB-214	4.4785E-01						
		351.99	4.367E-01	*(P	5.702E-02	2.65E-02	G K
		295.22	3.471E-01	- P	1.122E-01	4.22E-02	G
							Energy duplication
		77.11	5.802E-02	} P	3.941E-01	1.08E-01	G
		241.92	5.033E-01	(P	3.341E-01	1.06E-01	G
BI-212	5.0133E-01						
		727.17	5.013E-01	@(P	1.808E-01	7.29E-02	G K
		1620.56	9.113E-01	+ P	6.091E-01	2.81E-01	G
		785.42	5.031E-01	% P	1.328E+00	3.98E-01	G
BI-214	4.0150E-01						
		609.32	4.015E-01	*(P	6.957E-02	3.50E-02	G K
		1764.51	6.434E-01	+ P	9.510E-02	7.09E-02	G
		1120.28	5.639E-01	+ P	2.474E-01	1.15E-01	G
RA-224	1.7597E-01						
		241.00	1.760E-01	&(P	9.468E-01	2.85E-01	G
RA-226	1.3444E+00						
		185.99	1.344E+00	(	7.815E-01	2.88E-01	G
AC-228	6.0330E-01						
		911.07	5.989E-01	*(P	1.006E-01	5.09E-02	G K
		968.90	5.615E-01	(P	1.715E-01	6.55E-02	G
		338.40	6.747E-01	*(P	1.933E-01	7.93E-02	G
TH-227	-3.2220E-01						
		236.00	-3.222E-01	?(P	3.481E-01	1.07E-01	G K
		256.25	-3.719E-03	& P	3.377E-01	9.97E-02	G
PA-234	7.7993E-02						
		98.44	5.873E-04	%(	1.143E-01	3.41E-02	G K
		946.00	-3.439E-02	%	1.507E-01	4.45E-02	G
		131.28	-1.915E-02	&	1.470E-01	4.41E-02	G
		94.67	2.033E-01	?(	2.024E-01	6.24E-02	G
		883.24	5.965E-02	%	1.804E-01	5.36E-02	G
		926.70	1.543E-02	%	1.973E-01	5.63E-02	G

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 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26-6.365E-02 %   2.365E-01 7.04E-02 G

TH-234       7.9653E-01
                           63.29 5.962E-01 %(P 1.482E+00 4.47E-01 G K
                           92.80 1.057E+00 *(P 1.175E+00 3.60E-01 G
                           92.38-4.323E-02 % P 1.347E+00 4.02E-01 G

AM-241      -1.5158E-02
                           59.54-1.516E-02 %(P 1.839E-01 5.50E-02 G
   ( - This peak used in the nuclide activity average.

   * - Peak is too wide, but only one peak in library.
   ! - Peak is part of a multiplet and this area went
       negative during deconvolution.
   ? - Peak is too narrow.
   @ - Peak is too wide at FW25M, but ok at FWHM.
   % - Peak fails sensitivity test.
   $ - Peak identified, but first peak of this nuclide
       failed one or more qualification tests.
   + - Peak activity higher than counting uncertainty range.
   - - Peak activity lower than counting uncertainty range.
   = - Peak outside analysis energy range.
   & - Calculated peak centroid is not close enough to the
       library energy centroid for positive identification.
   P - Peakbackground subtraction
   } - Peak is too close to another for the activity
       to be found directly.

   Nuclide Codes:                      Peak Codes:
   T - Thermal Neutron Activation      G - Gamma Ray
   F - Fast Neutron Activation         X - X-Ray
   I - Fission Product                 P - Positron Decay
   N - Naturally Occurring Isotope     S - Single-Escape
   P - Photon Reaction                 D - Double-Escape
   C - Charged Particle Reaction       K - Key Line
   M - No MDA Calculation              A - Not in Average
   R - Coincidence Corrected           C - Coincidence Peak
   H - Halflife limit exceeded

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
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***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	2.9264E-02	2.9297E-02	1.6286E-01	1.6287E-01	1.847E-01
K-40	#	1.3479E+01	1.3479E+01	9.9355E-01	1.2732E+00	
MN-54	#A	1.2114E-04	1.2116E-04	2.1252E-02	2.1252E-02	2.478E-02
CO-57	#B	2.2865E-03	2.2870E-03	2.5964E-02	2.5965E-02	2.897E-02
CO-60	#B	-6.0275E-03	-6.0277E-03	6.1215E-02	6.1216E-02	2.702E-02

Sr-85	#A	-1.4422E-02	-1.4435E-02	2.8801E-02	2.8813E-02	3.168E-02
Kr-85	#A	-3.5817E+02	-3.5817E+02	7.6485E+02	7.6514E+02	7.345E+02
Y-88	#B	-1.8111E-03	-1.8122E-03	2.4169E-02	2.4169E-02	1.344E-02
NB-94	#B	-3.7930E-03	-3.7930E-03	2.2736E-02	2.2737E-02	2.505E-02
Ag-108M	#B	-2.0279E-04	-2.0279E-04	2.6695E-02	2.6695E-02	3.072E-02
CD-109	#A	1.7446E-02	1.7448E-02	7.6063E-01	7.6063E-01	8.488E-01
SN-113	#B	7.8300E-03	7.8342E-03	2.9050E-02	2.9054E-02	3.258E-02
SB-125	#B	6.4256E-02	6.4260E-02	5.4637E-02	5.4768E-02	7.487E-02
I-131	#B	-1.4852E-03	-1.4964E-03	1.8439E-02	1.8439E-02	2.089E-02
CS-134	#B	-7.2426E-03	-7.2432E-03	2.6543E-02	2.6546E-02	2.801E-02
CS-137	#A	8.5075E-03	8.5075E-03	2.7109E-02	2.7114E-02	3.055E-02
CE-139	#A	-7.7479E-04	-7.7513E-04	2.9152E-02	2.9152E-02	2.697E-02
EU-152	#B	9.7202E-03	9.7203E-03	8.3493E-02	8.3494E-02	9.296E-02
EU-154	#B	8.9084E-04	8.9086E-04	5.0981E-02	5.0981E-02	5.712E-02
EU-155	#B	5.9842E-02	5.9844E-02	1.0710E-01	1.0715E-01	1.176E-01
HG-203	#B	5.2735E-04	5.2804E-04	2.3078E-02	2.3078E-02	2.606E-02
TL-208	#	2.0933E-01	2.0933E-01	4.6278E-02	4.7901E-02	
PB-212		5.0657E-01	5.0657E-01	6.8544E-02	7.4789E-02	
PB-214		4.4785E-01	4.4785E-01	8.1540E-02	8.5722E-02	
BI-212	#	5.0133E-01	5.0133E-01	2.1858E-01	2.2057E-01	
BI-214		4.0150E-01	4.0150E-01	1.0484E-01	1.0749E-01	
RA-224	#A	1.7597E-01	1.7597E-01	8.5359E-01	8.5366E-01	9.468E-01
RA-226		1.3444E+00	1.3444E+00	8.6514E-01	8.6877E-01	
AC-228		6.0330E-01	6.0330E-01	1.1228E-01	1.1780E-01	
TH-227	#A	-3.2220E-01	-3.2220E-01	3.2174E-01	3.2231E-01	3.481E-01
PA-234	#B	7.7993E-02	7.7993E-02	7.1843E-02	7.1973E-02	1.143E-01
TH-234	#B	7.9653E-01	7.9653E-01	8.1307E-01	8.1427E-01	1.482E+00
AM-241	#A	-1.5158E-02	-1.5158E-02	1.8135E-01	1.8136E-01	1.839E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (1120.2 to 2000.1 keV) 1.7493719E+01 pCi/gm
Total Decayed Activity (1120.2 to 2000.1 keV) 1.7493719E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JPK

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 107F_13SEPT2006_0933.An1

Sample description
FSS-OOL-05-09-015-F

Spectrum Filename: C:\GammaVision\Spectra\107F_13SEPT2006_0933.An1

Acquisition information
Start time: 13-Sep-2006 09:33:14
Live time: 2000
Real time: 2003
Dead time: 0.13 %
Detector ID: 2

Detector system
Det 107- DSPE- 634

Calibration
Filename: D7_1LSa.Clb
Detector 107 Calibration for 1 Liter Sand Marinelli

Energy Calibration
Created: 29-Oct-2004 06:48:53
Zero offset: 0.157 keV
Gain: 0.500 keV/channel
Quadratic: -1.676E-08 keV/channel^2

Efficiency Calibration
Created: 29-Oct-2004 06:51:32
Type: Polynomial
Uncertainty: 1.174 %
Coefficients: -0.279532 -4.778179 0.614896
-0.087174 0.005356 -0.000131

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.16keV)
Stop channel: 4000 (2000.15keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 1.7580E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.7580E+03) =
5.6883E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	11-Sep-2006 14:40:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	107_150K_28APR05.Pbc 01-May-2005 05:30:33
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 13 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.1478

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
75.96	735.	8.88	3.65	2.905E-02	72.87	6.400	3.293E+00	HG203
					74.81	9.600	2.054E+00	PB212
					77.11	10.700	1.774E+00	PB214
					77.11	17.500	1.092E+00	PB212
185.56	188.	23.50	1.28	3.613E-02				
185.56	188.	23.50	1.28	3.613E-02	185.99	3.280	1.220E+00	RA226
239.24	1229.	4.53	2.20	3.185E-02	238.63	43.100	6.785E-01	PB212
					241.00	3.900	7.628E+00	RA224
295.51	320.	12.04	2.07	2.766E-02	295.22	19.200	4.564E-01	PB214
338.19	287.	13.85	2.23	2.501E-02	338.40	12.010	7.274E-01	AC228
351.79	501.	6.96	2.13	2.427E-02				
351.79	501.	6.96	2.13	2.427E-02	351.99	37.100	4.234E-01	PB214
463.20	41.	41.62	1.50	1.953E-02	463.51	10.000	PBC<MDA	SB125
510.92	172.	11.82	2.68	1.808E-02	510.72	22.500	3.256E-01	TL208
583.22	375.	6.61	2.06	1.629E-02	583.14	86.000	2.031E-01	TL208
609.32	350.	7.25	2.04	1.574E-02	609.32	46.090	3.658E-01	BI214
661.48	40.	34.81	1.59	1.477E-02	661.62	84.620	PBC<MDA	CS137
727.35	96.	21.83	1.51	1.374E-02	727.17	11.800	4.499E-01	BI212
794.85	48.	28.80	1.68	1.284E-02	795.76	85.400	3.357E-02	CS134
911.50	278.	10.78	2.73	1.160E-02	911.07	29.000	6.251E-01	AC228
967.47	225.	12.22	1.55	1.110E-02	968.90	17.460	8.833E-01	AC228
1119.74	99.	23.83	2.11	9.970E-03	1120.28	15.040	5.081E-01	BI214
1460.92	1462.	2.69	2.65	8.190E-03	1460.75	10.700	1.278E+01	K40
1764.53	83.	13.26	1.60	7.084E-03	1764.51	15.920	5.665E-01	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
151.58	75.96	1713.	236.	0.118	77.09	3.646	BI-207	s
590.64	295.51	613.	95.	0.047	114.90	2.068	PB-214	s
703.19	351.79	555.	162.	0.081	66.06	2.129	PB-214	s

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-212	149.64	74.98	1554.	205.	0.103	82.50	1.500s
PB-214	153.89	77.11	1402.	285.	0.143	57.42	1.500D
PB-212	153.89	77.11	1398.	290.	0.145	57.42	1.500D
RA-226	371.26	185.81	673.	99.	0.050	114.95	1.500s
PB-212	477.05	238.71	813.	768.	0.384	18.67	1.500s
RA-224	477.23	238.80	759.	655.	0.328	21.27	1.500s
PB-214	590.46	295.42	404.	221.	0.110	42.64	1.500s
AC-228	676.00	338.19	345.	284.	0.142	41.56	2.227s
PB-214	703.69	352.04	211.	347.	0.173	23.57	1.500s
TL-208	1021.42	510.92	155.	172.	0.086	35.47	2.681s
TL-208	1166.03	583.22	93.	370.	0.185	19.83	2.055s
BI-214	1218.22	609.32	109.	345.	0.173	21.74	2.041s
CS-137	1322.54	661.48	97.	40.	0.020	104.43	1.594s
BI-212	1454.27	727.35	109.	95.	0.047	65.50	1.512s
CS-134	1589.27	794.85	73.	48.	0.024	86.39	1.684s
AC-228	1822.56	911.50	128.	274.	0.137	32.34	2.728s
AC-228	1934.50	967.47	117.	223.	0.111	36.66	1.550s
BI-214	2239.05	1119.74	118.	99.	0.050	71.50	2.112
K-40	2921.43	1460.92	21.	1457.	0.729	8.06	2.651s
BI-214	3528.72	1764.53	9.	83.	0.042	39.77	1.597s

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	Peak MDA Value pCi/gm	COMMENTS
BE-7		-1.0403E-02					
			477.56	-1.040E-02	&(	2.410E-01 7.02E-02	G
K-40		1.2781E+01					
			1460.75	1.278E+01	*(P	2.099E-01 3.44E-01	G
MN-54		8.6207E-03					
			834.81	8.621E-03	%(P	2.673E-02 7.93E-03	G
CO-57		-1.9760E-03					
			122.07	-1.976E-03	&(P	3.250E-02 9.69E-03	G K
			136.43	-1.123E-01	% P	2.573E-01 7.79E-02	G
CO-60		2.6847E-04					
			1332.51	2.685E-04	%(P	3.023E-02 8.30E-03	G K
			1173.23	1.494E-04	% P	4.092E-02 1.17E-02	G K
Sr-85		-1.1954E-02					
			514.00	-1.195E-02	%(	3.144E-02 9.46E-03	G
Kr-85		-3.0044E+02					
			513.99	-3.004E+02	%(P	7.167E+02 2.14E+02	G
Y-88		-1.2458E-03					
			1836.01	-1.246E-03	%(P	2.040E-02 5.08E-03	G K
			898.02	8.643E-03	% P	2.697E-02 7.95E-03	G
NB-94		2.8800E-03					
			871.10	2.880E-03	&(P	2.911E-02 8.42E-03	G K
			702.50	7.058E-03	% P	2.494E-02 7.38E-03	G K
Ag-108M		-9.9223E-03					
			722.95	-9.922E-03	&(	3.749E-02 1.11E-02	G K
			614.37	-2.572E-02	&	3.869E-02 1.19E-02	G
			433.93	-9.771E-04	% P	2.412E-02 6.95E-03	G
CD-109		3.3392E-01					
			88.04	3.339E-01	%(P	1.012E+00 3.05E-01	G
SN-113		-1.9681E-03					
			391.71	-1.968E-03	%(P	3.164E-02 9.13E-03	G K
			255.04	-2.579E-01	%	1.103E+00 3.29E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	2.3527E-02						
		427.95	2.353E-02	%(P	6.760E-02	2.02E-02	G K
		600.77	3.489E-02	% P	1.269E-01	3.75E-02	G
		636.15	-1.396E-02	& P	2.242E-01	6.45E-02	G
		463.51	1.622E-01	% P	2.343E-01	7.21E-02	G
		176.29	2.049E-02	& P	3.824E-01	1.14E-01	G
I-131	4.0883E-03						
		364.48	4.088E-03	&(	3.027E-02	8.91E-03	G K
		636.97	-4.142E-02	&	3.948E-01	1.15E-01	G
		284.29	-9.521E-02	%	4.565E-01	1.36E-01	G
CS-134	1.2536E-02						
		604.66	-5.873E-03	%(P	3.892E-02	1.15E-02	G K
		795.76	3.357E-02	*(P	2.991E-02	9.77E-03	G
		569.29	1.352E-02	&	1.547E-01	4.49E-02	G
		801.84	2.371E-02	% P	3.156E-01	9.09E-02	G
CS-137	2.4706E-02						
		661.62	2.471E-02	(P	2.995E-02	9.36E-03	G
CE-139	5.9097E-03						
		165.85	5.910E-03	&(P	3.237E-02	9.69E-03	G
EU-152	-9.5812E-05						
		121.78	-9.581E-05	&(P	9.759E-02	2.90E-02	G K
		344.30	-2.683E-02	% P	8.862E-02	2.65E-02	G
		1408.08	1.540E-02	% P	1.024E-01	2.85E-02	G
		964.00	-7.763E-04	& P	2.248E-01	6.43E-02	G
		1112.07	-3.619E-02	% P	2.587E-01	7.49E-02	G
		778.90	1.029E-02	% P	2.019E-01	5.79E-02	G
EU-154	1.9443E-02						
		123.10	1.944E-02	%(P	6.872E-02	2.07E-02	G K
		1274.80	-2.045E-02	% P	9.748E-02	2.84E-02	G
		723.30	-4.197E-02	& P	1.658E-01	4.91E-02	G
		1004.80	6.805E-02	% P	1.160E-01	3.59E-02	G
EU-155	3.3267E-02						
		86.45	3.327E-02	%(	1.239E-01	3.73E-02	G K
		105.31	3.389E-02	% P	1.349E-01	4.05E-02	G
HG-203	3.8266E-03						
		279.17	3.827E-03	&(P	2.969E-02	8.80E-03	G K
		72.87	-2.412E-01	% P	8.725E-01	2.63E-01	G
		70.83	-1.916E-03	%	1.476E+00	4.41E-01	G
		82.50	-6.429E-01	%	1.844E+00	5.57E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	2.0305E-01						
		583.14	2.031E-01	*(P	2.614E-02	1.36E-02	G
		510.72	3.256E-01	+ P	1.146E-01	4.60E-02	G
PB-212	4.2989E-01						
		238.63	4.294E-01	*(P	7.582E-02	2.73E-02	G K
							Energy duplication
		77.11	4.310E-01	*(	2.628E-01	8.25E-02	G
		74.81	5.770E-01	+ P	5.239E-01	1.62E-01	G
PB-214	3.0402E-01						
		351.99	2.962E-01	*(P	6.019E-02	2.36E-02	G K
		295.22	3.191E-01	*(P	1.394E-01	4.63E-02	G
							Energy duplication
		77.11	6.934E-01	+ P	4.305E-01	1.35E-01	G
		241.92	-2.855E-01	% P	5.374E-01	1.63E-01	G
BI-212	4.4990E-01						
		727.17	4.499E-01	*(P	2.436E-01	9.96E-02	G K
		1620.56	2.243E-01	% P	6.743E-01	1.95E-01	G
		785.42	1.993E-01	% P	1.198E+00	3.46E-01	G
BI-214	3.6580E-01						
		609.32	3.658E-01	*(P	5.435E-02	2.68E-02	G K
		1764.51	5.665E-01	+ P	1.132E-01	7.59E-02	G
		1120.28	5.081E-01	+ P	2.733E-01	1.22E-01	G
RA-224	4.0726E+00						
		241.00	4.073E+00	&(P	8.152E-01	2.90E-01	G
RA-226	6.4391E-01						
		185.99	6.439E-01	*(	8.022E-01	2.47E-01	G
AC-228	6.5510E-01						
		911.07	6.251E-01	*(P	1.267E-01	6.85E-02	G K
		968.90	8.833E-01	+ P	2.112E-01	1.09E-01	G
		338.40	7.274E-01	*(P	2.284E-01	1.02E-01	G
TH-227	-5.8446E-04						
		236.00	-5.845E-04	%(P	3.475E-01	1.04E-01	G K
		256.25	4.900E-02	% P	3.352E-01	9.94E-02	G
PA-234	4.4604E-02						
		98.44	4.460E-02	%(	1.258E-01	3.80E-02	G K
		946.00	1.202E-02	%	1.656E-01	4.79E-02	G
		131.28	-2.691E-02	%	1.444E-01	4.33E-02	G
		94.67	-6.770E-02	%	2.372E-01	7.15E-02	G
		883.24	9.429E-02	%	1.891E-01	5.76E-02	G
		926.70	6.928E-02	%	2.271E-01	6.71E-02	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26 2.008E-02 &   2.292E-01 6.66E-02 G

TH-234       2.5203E-01
                           63.29 2.520E-01 %(P 1.554E+00 4.65E-01 G K
                           92.80 4.737E-01 % P 1.223E+00 3.68E-01 G
                           92.38 5.998E-01 % P 1.458E+00 4.40E-01 G

AM-241      -2.9212E-03
                           59.54-2.921E-03 %(P 1.953E-01 5.82E-02 G
   ( - This peak used in the nuclide activity average.

   * - Peak is too wide, but only one peak in library.
   ! - Peak is part of a multiplet and this area went
       negative during deconvolution.
   ? - Peak is too narrow.
   @ - Peak is too wide at FW25M, but ok at FWHM.
   % - Peak fails sensitivity test.
   $ - Peak identified, but first peak of this nuclide
       failed one or more qualification tests.
   + - Peak activity higher than counting uncertainty range.
   - - Peak activity lower than counting uncertainty range.
   = - Peak outside analysis energy range.
   & - Calculated peak centroid is not close enough to the
       library energy centroid for positive identification.
   P - Peakbackground subtraction
   } - Peak is too close to another for the activity
       to be found directly.

   Nuclide Codes:                      Peak Codes:
   T - Thermal Neutron Activation      G - Gamma Ray
   F - Fast Neutron Activation         X - X-Ray
   I - Fission Product                 P - Positron Decay
   N - Naturally Occurring Isotope     S - Single-Escape
   P - Photon Reaction                 D - Double-Escape
   C - Charged Particle Reaction       K - Key Line
   M - No MDA Calculation              A - Not in Average
   R - Coincidence Corrected           C - Coincidence Peak
   H - Halflife limit exceeded

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
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***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	-1.0164E-02	-1.0403E-02	2.1045E-01	2.1045E-01	2.355E-01
K-40	#	1.2781E+01	1.2781E+01	1.0332E+00	1.2796E+00	
MN-54	#A	8.5865E-03	8.6207E-03	2.3801E-02	2.3806E-02	2.662E-02
CO-57	#B	-1.9670E-03	-1.9760E-03	3.1062E-02	3.1062E-02	3.235E-02
CO-60	#B	2.6830E-04	2.6847E-04	2.4887E-02	2.4887E-02	3.022E-02

Sr-85	#A	-1.1727E-02	-1.1954E-02	2.8385E-02	2.8393E-02	3.084E-02
Kr-85	#A	-3.0044E+02	-3.0044E+02	7.8407E+02	7.8427E+02	7.167E+02
Y-88	#B	-1.2314E-03	-1.2458E-03	1.0409E-01	1.0409E-01	2.016E-02
NB-94	#B	2.8800E-03	2.8800E-03	2.5247E-02	2.5248E-02	2.911E-02
Ag-108M	#B	-9.9220E-03	-9.9223E-03	3.3447E-02	3.3453E-02	3.749E-02
CD-109	#A	3.3301E-01	3.3392E-01	9.1630E-01	9.1648E-01	1.009E+00
SN-113	#B	-1.9470E-03	-1.9681E-03	8.2129E-02	8.2129E-02	3.130E-02
SB-125	#B	2.3498E-02	2.3527E-02	6.0517E-02	6.0533E-02	6.751E-02
I-131	#B	3.5046E-03	4.0883E-03	2.6725E-02	2.6726E-02	2.594E-02
CS-134	#B	1.2515E-02	1.2536E-02	1.0949E-02	1.0974E-02	3.886E-02
CS-137	#A	2.4703E-02	2.4706E-02	2.8068E-02	2.8106E-02	2.995E-02
CE-139	#A	5.8567E-03	5.9097E-03	2.9062E-02	2.9064E-02	3.208E-02
EU-152	#B	-9.5786E-05	-9.5812E-05	2.4066E-02	2.4066E-02	9.756E-02
EU-154	#B	1.9435E-02	1.9443E-02	6.2026E-02	6.2036E-02	6.869E-02
EU-155	#B	3.3245E-02	3.3267E-02	1.1198E-01	1.1200E-01	1.238E-01
HG-203	#B	3.7262E-03	3.8266E-03	2.6392E-02	2.6393E-02	2.891E-02
TL-208	#	2.0305E-01	2.0305E-01	4.0764E-02	4.2492E-02	
PB-212	#	4.2989E-01	4.2989E-01	8.1898E-02	8.5743E-02	7.582E-02
PB-214	#	3.0402E-01	3.0402E-01	7.2716E-02	7.4900E-02	6.019E-02
BI-212	#	4.4990E-01	4.4990E-01	2.9868E-01	2.9986E-01	
BI-214		3.6580E-01	3.6580E-01	8.0528E-02	8.3376E-02	
RA-224	#	4.0726E+00	4.0726E+00	8.6910E-01	9.0177E-01	8.152E-01
RA-226	#A	6.4391E-01	6.4391E-01	7.4017E-01	7.4114E-01	8.022E-01
AC-228	#	6.5510E-01	6.5510E-01	1.7472E-01	1.7895E-01	
TH-227	#B	-5.8446E-04	-5.8446E-04	1.7010E-01	1.7010E-01	3.475E-01
PA-234	#B	4.4604E-02	4.4604E-02	1.1397E-01	1.1399E-01	1.258E-01
TH-234	#B	2.5203E-01	2.5203E-01	1.3943E+00	1.3944E+00	1.554E+00
AM-241	#A	-2.9211E-03	-2.9212E-03	3.1607E-01	3.1607E-01	1.953E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (50.2 to 2000.1 keV) 1.4455038E+01 pCi/gm
Total Decayed Activity (50.2 to 2000.1 keV) 1.4455038E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JPK

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 107F_13SEPT2006_1014.An1

Sample description
FSS-OOL-05-09-003-F

Spectrum Filename: C:\GammaVision\Spectra\107F_13SEPT2006_1014.An1

Acquisition information

Start time:	13-Sep-2006 10:15:06
Live time:	2000
Real time:	2002
Dead time:	0.12 %
Detector ID:	2

Detector system
Det 107- DSPE- 634

Calibration

Filename:	D7_1LSa.Clb

Detector 107 Calibration for 1 Liter Sand Marinelli

Energy Calibration

Created:	29-Oct-2004 06:48:53
Zero offset:	0.157 keV
Gain:	0.500 keV/channel
Quadratic:	-1.676E-08 keV/channel^2

Efficiency Calibration

Created:	29-Oct-2004 06:51:32
Type:	Polynomial
Uncertainty:	1.174 %
Coefficients:	-0.279532 -4.778179 0.614896
	-0.087174 0.005356 -0.000131

Library Files

Main analysis library:	FSS_Rev_1.Lib
Library Match Width:	1.000
Peak stripping:	Library based

Analysis parameters

Analysis engine:	Env32 G53W4.20
Start channel:	100 (50.16keV)
Stop channel:	4000 (2000.15keV)
Peak rejection level:	41.667%
Peak search sensitivity:	3
Sample Size:	1.6910E+03
Activity scaling factor:	1.0000E+06/(1.0000E+00* 1.6910E+03) = 5.9137E+02
Detection limit method:	Nureg 4.16
Random error:	1.0000000E+00
Systematic error:	1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

YAEC Chemistry Lab Spectrum name: 107F_13SEPT2006_1014.An1

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	11-Sep-2006 14:02:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	107_150K_28APR05.Pbc 01-May-2005 05:30:33
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 13 cutoff 20.00000 %
Energy Calibration
Normalized diff: 1.0000

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
75.98	573.	10.21	4.05	2.906E-02	74.81	9.600	1.662E+00	PB212
					77.11	10.700	1.434E+00	PB214
					77.11	17.500	8.843E-01	PB212
93.65	112.	37.59	1.64	3.456E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
					94.67	15.500	1.668E-01	PA234
186.25	138.	24.21	2.16	3.608E-02	185.99	3.280	9.327E-01	RA226
239.23	985.	4.89	1.69	3.185E-02	238.63	43.100	5.636E-01	PB212
					241.92	7.470	3.327E+00	PB214
295.04	142.	17.19	1.62	2.769E-02				
295.04	142.	17.19	1.62	2.769E-02	295.22	19.200	2.063E-01	PB214
338.83	153.	20.18	1.76	2.498E-02	338.40	12.010	3.991E-01	AC228
352.00	364.	7.73	1.70	2.426E-02	351.99	37.100	3.186E-01	PB214
462.99	67.	31.38	1.46	1.954E-02				
462.99	67.	31.38	1.46	1.954E-02	463.51	10.000	2.638E-01	SB125
511.27	154.	15.80	2.34	1.807E-02	510.72	22.500	2.372E-01	TL208
					513.99	0.004	1.564E+03	Kr85
					514.00	99.270	7.047E-02	Sr85
583.35	247.	9.91	2.10	1.629E-02	583.14	86.000	1.382E-01	TL208
609.51	332.	7.90	2.50	1.574E-02	609.32	46.090	3.611E-01	BI214
661.52	38.	34.17	1.59	1.477E-02	661.62	84.620	PBC<MDA	CS137
727.11	48.	31.75	1.51	1.374E-02	727.17	11.800	2.381E-01	BI212
769.03	49.	33.25	0.70	1.317E-02				
911.14	185.	10.05	2.05	1.161E-02	911.07	29.000	4.301E-01	AC228
968.50	184.	12.96	1.19	1.110E-02	968.90	17.460	7.483E-01	AC228
1120.58	94.	20.18	1.74	9.968E-03	1120.28	15.040	4.963E-01	BI214
1460.86	1249.	2.87	2.46	8.190E-03	1460.75	10.700	1.135E+01	K40

1765.19	51.	15.38	0.79	7.084E-03	1764.51	15.920	3.621E-01	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
151.62	75.98	1350.	205.	0.102	78.88	4.045	BI-207	s
186.97	93.65	670.	112.	0.056	112.78	1.643	U-235	l
478.10	239.23	1023.	367.	0.183	40.17	1.691	PB-212	s
925.58	462.99	119.	70.	0.035	74.75	1.459	AC-228	
1537.62	769.03	64.	49.	0.024	82.22	0.705	BI-214	sM

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.
M - Peak is close to a library peak.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-212	149.53	74.93	1269.	143.	0.071	105.90	1.500s
PB-214	153.89	77.11	1167.	216.	0.108	68.44	1.500D
PB-212	153.89	77.11	1162.	221.	0.111	68.44	1.500D
RA-226	372.13	186.25	409.	138.	0.069	72.63	2.159s
PB-212	477.02	238.69	677.	594.	0.297	21.64	1.500s
PB-214	590.03	295.20	278.	136.	0.068	55.90	1.500s
AC-228	677.27	338.83	254.	150.	0.075	60.54	1.763s
PB-214	703.59	351.99	169.	300.	0.150	24.72	1.500D
TL-208	1022.13	511.27	163.	121.	0.060	47.40	2.335s
TL-208	1166.29	583.35	108.	242.	0.121	29.72	2.098s
BI-214	1218.61	609.51	103.	328.	0.164	23.69	2.497s
CS-137	1322.61	661.52	82.	38.	0.019	102.52	1.594s
BI-212	1453.80	727.11	70.	48.	0.024	95.24	1.508s
AC-228	1821.85	911.14	55.	181.	0.091	30.16	2.049s
AC-228	1936.57	968.50	84.	181.	0.091	38.88	1.186s
BI-214	2240.72	1120.58	71.	93.	0.047	60.55	1.735s
K-40	2921.32	1460.86	16.	1244.	0.622	8.61	2.462s
BI-214	3530.03	1765.19	4.	51.	0.026	46.15	0.794s

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	MDA Value pCi/gm	COMMENTS
BE-7		4.3256E-02					
			477.56	4.326E-02	%(	2.038E-01 5.99E-02	G
K-40		1.1345E+01					
			1460.75	1.135E+01	*(P	1.932E-01 3.27E-01	G
MN-54		-3.1225E-04					
			834.81	-3.122E-04	%(P	2.231E-02 6.21E-03	G
CO-57		-1.4124E-03					
			122.07	-1.412E-03	%(P	2.884E-02 8.57E-03	G K
			136.43	3.278E-02	% P	2.342E-01 6.99E-02	G
CO-60		2.8064E-03					
			1332.51	2.806E-03	%(P	2.735E-02 7.51E-03	G K
			1173.23	-2.349E-03	% P	3.609E-02 1.00E-02	G K
Sr-85		-1.4129E-02					
			514.00	-1.413E-02	&(	3.183E-02 9.63E-03	G
Kr-85		-3.5092E+02					
			513.99	-3.509E+02	&(P	7.256E+02 2.18E+02	G
Y-88		-9.6455E-04					
			1836.01	-9.645E-04	%(P	2.740E-02 7.18E-03	G K
			898.02	4.258E-03	& P	2.657E-02 7.61E-03	G
NB-94		1.4719E-03					
			871.10	1.472E-03	%(P	2.114E-02 5.95E-03	G K
			702.50	-5.217E-03	% P	2.874E-02 8.40E-03	G K
Ag-108M		-1.0229E-02					
			722.95	-1.023E-02	&(	3.621E-02 1.08E-02	G K
			614.37	-1.137E-02	%	3.347E-02 1.00E-02	G
			433.93	-2.794E-03	& P	2.240E-02 6.46E-03	G
CD-109		3.6929E-01					
			88.04	3.693E-01	%(P	9.440E-01 2.85E-01	G
SN-113		-7.1662E-03					
			391.71	-7.166E-03	&(P	3.221E-02 9.43E-03	G K
			255.04	-6.533E-02	%	1.096E+00 3.24E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	2.9321E-02						
		427.95	2.932E-02	%(P	5.137E-02	1.57E-02	G K
		600.77	3.040E-02	& P	1.104E-01	3.24E-02	G
		636.15	-6.559E-03	% P	1.844E-01	5.20E-02	G
		463.51	-2.461E-02	% P	2.107E-01	6.02E-02	G
		176.29	-9.636E-03	% P	3.823E-01	1.13E-01	G
I-131	1.0541E-02						
		364.48	1.054E-02	%(	2.920E-02	8.76E-03	G K
		636.97	-6.355E-02	%	3.915E-01	1.14E-01	G
		284.29	3.895E-02	&	4.209E-01	1.24E-01	G
CS-134	-9.8243E-03						
		604.66	-9.824E-03	%(P	3.061E-02	9.12E-03	G K
		795.76	1.998E-02	% P	3.064E-02	9.48E-03	G
		569.29	2.154E-02	%	1.267E-01	3.68E-02	G
		801.84	1.619E-02	% P	3.045E-01	8.71E-02	G
CS-137	2.4085E-02						
		661.62	2.409E-02	*(P	2.872E-02	9.00E-03	G
CE-139	1.3994E-03						
		165.85	1.399E-03	%(P	2.896E-02	8.59E-03	G
EU-152	-6.7454E-03						
		121.78	-6.745E-03	%(P	8.745E-02	2.60E-02	G K
		344.30	-4.317E-04	% P	8.787E-02	2.56E-02	G
		1408.08	2.969E-02	% P	9.666E-02	2.79E-02	G
		964.00	-1.326E-03	& P	2.974E-01	8.62E-02	G
		1112.07	3.637E-02	& P	2.092E-01	6.03E-02	G
		778.90	3.308E-02	% P	1.716E-01	4.97E-02	G
EU-154	-1.0762E-03						
		123.10	-1.076E-03	%(P	6.279E-02	1.86E-02	G K
		1274.80	1.679E-02	% P	8.671E-02	2.51E-02	G
		723.30	-4.295E-02	& P	1.662E-01	4.92E-02	G
		1004.80	1.975E-03	& P	1.406E-01	3.93E-02	G
EU-155	4.5839E-02						
		86.45	4.584E-02	&(	1.083E-01	3.28E-02	G K
		105.31	9.317E-03	% P	1.268E-01	3.78E-02	G
HG-203	-2.9108E-03						
		279.17	-2.911E-03	&(P	2.869E-02	8.45E-03	G K
		72.87	-2.370E-01	% P	7.638E-01	2.30E-01	G
		70.83	-4.593E-01	%	1.417E+00	4.28E-01	G
		82.50	-1.764E-01	&	1.758E+00	5.26E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	1.3819E-01						
		583.14	1.382E-01	*(P	2.914E-02	1.40E-02	G
		510.72	2.372E-01	+ P	1.223E-01	4.80E-02	G
PB-212	3.5399E-01						
		238.63	3.450E-01	*(P	7.205E-02	2.55E-02	G K
							Energy duplication
		77.11	3.415E-01	*(	2.495E-01	7.79E-02	G
		74.81	4.168E-01	*(P	4.928E-01	1.51E-01	G
PB-214	2.6644E-01						
							Energy duplication
		351.99	2.664E-01	*(P	5.613E-02	2.23E-02	G K
		295.22	2.049E-01	- P	1.210E-01	3.94E-02	G
							Energy duplication
		77.11	5.465E-01	+ P	4.089E-01	1.27E-01	G
		241.92	-2.095E-01	% P	5.046E-01	1.53E-01	G
BI-212	2.3808E-01						
		727.17	2.381E-01	*(P	2.051E-01	7.76E-02	G K
		1620.56	-1.928E-02	% P	1.137E+00	3.11E-01	G
		785.42	3.203E-01	% P	1.316E+00	3.85E-01	G
BI-214	3.6139E-01						
		609.32	3.611E-01	*(P	5.511E-02	2.89E-02	G K
		1764.51	3.621E-01	*(P	8.439E-02	5.67E-02	G
		1120.28	4.963E-01	+ P	2.235E-01	1.01E-01	G
RA-224	4.3900E-02						
		241.00	4.390E-02	&(P	8.588E-01	2.56E-01	G
RA-226	9.3268E-01						
		185.99	9.327E-01	*(	6.542E-01	2.26E-01	G
AC-228	4.2102E-01						
		911.07	4.301E-01	*(P	8.835E-02	4.42E-02	G K
		968.90	7.483E-01	+ P	1.870E-01	9.82E-02	G
		338.40	3.991E-01	*(P	2.049E-01	8.22E-02	G
TH-227	-1.9708E-01						
		236.00	-1.971E-01	%(P	2.777E-01	8.50E-02	G K
		256.25	-1.976E-02	% P	3.369E-01	9.90E-02	G
PA-234	-3.6311E-02						
		98.44	-3.631E-02	%(	1.053E-01	3.17E-02	G K
		946.00	0.000E+00	%	1.582E-01	4.51E-02	G
		131.28	1.113E-03	%	1.287E-01	3.82E-02	G
		94.67	1.902E-02	%	2.052E-01	6.13E-02	G
		883.24	8.231E-03	%	1.641E-01	4.57E-02	G
		926.70	3.879E-02	&	2.221E-01	6.41E-02	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26 3.190E-02 %   1.877E-01 5.45E-02 G

TH-234       2.1477E-01
                           63.29 2.148E-01 &(P 1.357E+00 4.04E-01 G K
                           92.80 5.084E-01 % P 1.115E+00 3.36E-01 G
                           92.38-1.185E-01 & P 1.339E+00 3.98E-01 G

AM-241       2.1293E-02
                           59.54 2.129E-02 &(P 1.799E-01 5.37E-02 G
   ( - This peak used in the nuclide activity average.

   * - Peak is too wide, but only one peak in library.
   ! - Peak is part of a multiplet and this area went
       negative during deconvolution.
   ? - Peak is too narrow.
   @ - Peak is too wide at FW25M, but ok at FWHM.
   % - Peak fails sensitivity test.
   $ - Peak identified, but first peak of this nuclide
       failed one or more qualification tests.
   + - Peak activity higher than counting uncertainty range.
   - - Peak activity lower than counting uncertainty range.
   = - Peak outside analysis energy range.
   & - Calculated peak centroid is not close enough to the
       library energy centroid for positive identification.
   P - Peakbackground subtraction
   } - Peak is too close to another for the activity
       to be found directly.

   Nuclide Codes:                      Peak Codes:
   T - Thermal Neutron Activation      G - Gamma Ray
   F - Fast Neutron Activation         X - X-Ray
   I - Fission Product                 P - Positron Decay
   N - Naturally Occurring Isotope     S - Single-Escape
   P - Photon Reaction                 D - Double-Escape
   C - Charged Particle Reaction       K - Key Line
   M - No MDA Calculation              A - Not in Average
   R - Coincidence Corrected           C - Coincidence Peak
   H - Halflife limit exceeded

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
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***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	4.2234E-02	4.3256E-02	1.7980E-01	1.7982E-01	1.990E-01
K-40	#	1.1345E+01	1.1345E+01	9.8027E-01	1.1874E+00	
MN-54	#A	-3.1097E-04	-3.1225E-04	3.2016E-01	3.2016E-01	2.222E-02
CO-57	#B	-1.4057E-03	-1.4124E-03	2.8309E-02	2.8309E-02	2.871E-02
CO-60	#B	2.8046E-03	2.8064E-03	2.2537E-02	2.2538E-02	2.733E-02

Sr-85	#A	-1.3853E-02	-1.4129E-02	2.8880E-02	2.8892E-02	3.121E-02
Kr-85	#A	-3.5092E+02	-3.5092E+02	7.8002E+02	7.8030E+02	7.256E+02
Y-88	#B	-9.5306E-04	-9.6455E-04	3.5045E-02	3.5045E-02	2.707E-02
NB-94	#B	1.4719E-03	1.4719E-03	1.7840E-02	1.7840E-02	2.114E-02
Ag-108M	#B	-1.0228E-02	-1.0229E-02	3.2317E-02	3.2322E-02	3.621E-02
CD-109	#A	3.6825E-01	3.6929E-01	8.5615E-01	8.5639E-01	9.414E-01
SN-113	#B	-7.0871E-03	-7.1662E-03	3.7733E-02	3.7735E-02	3.186E-02
SB-125	#B	2.9284E-02	2.9321E-02	4.7111E-02	4.7143E-02	5.131E-02
I-131	#B	8.9925E-03	1.0541E-02	2.6274E-02	2.6282E-02	2.491E-02
CS-134	#B	-9.8076E-03	-9.8243E-03	2.8928E-02	2.8933E-02	3.056E-02
CS-137	#A	2.4083E-02	2.4085E-02	2.7009E-02	2.7047E-02	2.872E-02
CE-139	#A	1.3865E-03	1.3994E-03	2.5762E-02	2.5762E-02	2.869E-02
EU-152	#B	-6.7436E-03	-6.7454E-03	8.0449E-02	8.0450E-02	8.743E-02
EU-154	#B	-1.0758E-03	-1.0762E-03	9.5450E-02	9.5450E-02	6.277E-02
EU-155	#B	4.5807E-02	4.5839E-02	9.8380E-02	9.8413E-02	1.083E-01
HG-203	#B	-2.8321E-03	-2.9108E-03	3.4712E-02	3.4712E-02	2.792E-02
TL-208	#	1.3819E-01	1.3819E-01	4.1837E-02	4.2626E-02	
PB-212	#	3.5399E-01	3.5399E-01	7.8629E-02	8.1361E-02	7.205E-02
PB-214	#	2.6644E-01	2.6644E-01	6.6973E-02	6.8796E-02	5.613E-02
BI-212	#	2.3808E-01	2.3808E-01	2.3280E-01	2.3322E-01	
BI-214	#	3.6139E-01	3.6139E-01	8.6726E-02	8.9314E-02	
RA-224	#A	4.3900E-02	4.3900E-02	7.6709E-01	7.6709E-01	8.588E-01
RA-226	#	9.3268E-01	9.3268E-01	6.7737E-01	6.7960E-01	
AC-228	#	4.2102E-01	4.2102E-01	1.2993E-01	1.3229E-01	
TH-227	#B	-1.9708E-01	-1.9708E-01	2.5670E-01	2.5696E-01	2.777E-01
PA-234	#B	-3.6311E-02	-3.6311E-02	9.5204E-02	9.5225E-02	1.053E-01
TH-234	#B	2.1477E-01	2.1477E-01	1.2127E+00	1.2127E+00	1.357E+00
AM-241	#A	2.1293E-02	2.1293E-02	1.6117E-01	1.6117E-01	1.799E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (50.2 to 2000.1 keV) 1.3436793E+01 pCi/gm
Total Decayed Activity (50.2 to 2000.1 keV) 1.3436796E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JPK

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 107F_13SEPT2006_1053.An1

Sample description
FSS-OOL-05-09-006-F

Spectrum Filename: C:\GammaVision\Spectra\107F_13SEPT2006_1053.An1

Acquisition information

Start time:	13-Sep-2006 10:52:58
Live time:	2000
Real time:	2002
Dead time:	0.11 %
Detector ID:	2

Detector system
Det 107- DSPE- 634

Calibration

Filename:	D7_1LSa.Clb

Detector 107 Calibration for 1 Liter Sand Marinelli

Energy Calibration

Created:	29-Oct-2004 06:48:53
Zero offset:	0.157 keV
Gain:	0.500 keV/channel
Quadratic:	-1.676E-08 keV/channel^2

Efficiency Calibration

Created:	29-Oct-2004 06:51:32
Type:	Polynomial
Uncertainty:	1.174 %
Coefficients:	-0.279532 -4.778179 0.614896
	-0.087174 0.005356 -0.000131

Library Files

Main analysis library:	FSS_Rev_1.Lib
Library Match Width:	1.000
Peak stripping:	Library based

Analysis parameters

Analysis engine:	Env32 G53W4.20
Start channel:	100 (50.16keV)
Stop channel:	4000 (2000.15keV)
Peak rejection level:	41.667%
Peak search sensitivity:	3
Sample Size:	1.6620E+03
Activity scaling factor:	1.0000E+06/(1.0000E+00* 1.6620E+03) = 6.0168E+02
Detection limit method:	Nureg 4.16
Random error:	1.0000000E+00
Systematic error:	1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	11-Sep-2006 14:10:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	107_150K_28APR05.Pbc 01-May-2005 05:30:33
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 13 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.4133

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
76.17	739.	9.46	3.58	2.915E-02	72.87	6.400	3.506E+00	HG203
					74.81	9.600	2.185E+00	PB212
					77.11	17.500	1.161E+00	PB212
					77.11	10.700	1.887E+00	PB214
93.07	121.	34.14	1.95	3.444E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
185.70	97.	37.26	1.50	3.610E-02	185.99	3.280	PBC<MDA	RA226
239.11	1220.	5.15	1.87	3.186E-02	238.63	43.100	7.124E-01	PB212
295.19	180.	17.42	2.36	2.768E-02				
295.19	180.	17.42	2.36	2.768E-02	295.22	19.200	2.677E-01	PB214
338.67	250.	13.34	1.48	2.499E-02	338.40	12.010	6.693E-01	AC228
352.17	503.	7.05	2.01	2.425E-02	351.99	37.100	4.495E-01	PB214
463.00	60.	25.65	1.50	1.953E-02	463.51	10.000	2.496E-01	SB125
511.11	219.	15.30	1.83	1.807E-02	510.72	22.500	3.696E-01	TL208
583.35	368.	7.24	1.90	1.629E-02	583.14	86.000	2.111E-01	TL208
609.53	385.	7.46	2.77	1.574E-02	609.32	46.090	4.268E-01	BI214
662.07	127.	18.46	2.66	1.477E-02	661.62	84.620	8.260E-02	CS137
727.85	46.	39.74	1.84	1.374E-02	727.17	11.800	PBC<MDA	BI212
795.58	32.	40.93	1.68	1.284E-02	795.76	85.400	PBC<MDA	CS134
911.28	250.	8.63	2.59	1.161E-02	911.07	29.000	5.936E-01	AC228
968.62	239.	10.60	2.66	1.109E-02	968.90	17.460	9.948E-01	AC228
1120.33	60.	29.66	1.90	9.970E-03	1120.28	15.040	3.269E-01	BI214
1460.89	1570.	2.58	2.88	8.190E-03	1460.75	10.700	1.452E+01	K40
1764.82	55.	16.01	2.29	7.084E-03	1764.51	15.920	3.953E-01	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
152.00	76.17	1745.	376.	0.188	49.61	3.576	BI-207	s
185.79	93.07	751.	121.	0.060	102.43	1.947	PB-214	l
477.86	239.11	1373.	564.	0.282	30.59	1.870	PB-212	s
703.95	352.17	596.	142.	0.071	77.05	2.005	PB-214	s
1218.64	609.53	342.	162.	0.081	53.78	2.775	BI-214	s

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-212	153.89	77.11	1496.	289.	0.145	59.36	1.500D
PB-214	153.89	77.11	1501.	285.	0.142	59.36	1.500D
RA-226	371.05	185.70	609.	97.	0.049	111.77	1.500s
TH-227	470.77	235.57	1088.	-125.	-0.062	115.51	1.500s
PB-212	477.13	238.75	876.	697.	0.349	20.75	1.500s
PB-214	589.96	295.17	380.	145.	0.073	60.16	1.500s
AC-228	676.95	338.67	274.	247.	0.124	40.03	1.484s
PB-214	703.81	352.10	253.	355.	0.178	24.35	1.500s
SB-125	925.61	463.00	101.	60.	0.030	76.95	1.500s
TL-208	1021.81	511.11	248.	185.	0.092	45.91	1.831s
TL-208	1166.29	583.35	122.	364.	0.182	21.71	1.903s
BI-214	1218.53	609.47	157.	248.	0.124	28.12	1.558s
CS-137	1323.71	662.07	125.	127.	0.063	55.37	2.660s
BI-212	1455.26	727.85	100.	46.	0.023	119.21	1.839
CS-134	1590.73	795.58	75.	32.	0.016	122.79	1.684s
AC-228	1822.12	911.28	76.	246.	0.123	25.90	2.587s
AC-228	1936.81	968.62	94.	237.	0.118	31.81	2.655s
BI-214	2240.23	1120.33	135.	60.	0.030	88.99	1.897s
K-40	2921.38	1460.89	21.	1565.	0.782	7.74	2.879s
BI-214	3529.30	1764.82	13.	55.	0.027	48.02	2.291s

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	Peak MDA Value pCi/gm	COMMENTS
BE-7		2.9300E-02					
			477.56	2.930E-02	&(	2.539E-01 7.44E-02	G
K-40		1.4517E+01					
			1460.75	1.452E+01	*(P	2.243E-01 3.76E-01	G
MN-54		5.6426E-03					
			834.81	5.643E-03	%(P	2.654E-02 7.74E-03	G
CO-57		-6.9391E-05					
			122.07	-6.939E-05	&(P	3.449E-02 1.03E-02	G K
			136.43	-1.421E-02	& P	2.760E-01 8.23E-02	G
CO-60		5.4742E-03					
			1332.51	5.474E-03	%(P	3.095E-02 8.74E-03	G K
			1173.23	1.756E-02	% P	3.873E-02 1.16E-02	G K
Sr-85		-9.0196E-03					
			514.00	-9.020E-03	%(	3.681E-02 1.10E-02	G
Kr-85		-2.3654E+02					
			513.99	-2.365E+02	%(P	8.377E+02 2.49E+02	G
Y-88		-9.8151E-04					
			1836.01	-9.815E-04	%(P	8.894E-03 1.21E-03	G K
			898.02	-1.997E-03	& P	3.066E-02 8.63E-03	G
NB-94		5.4057E-03					
			871.10	5.406E-03	&(P	2.559E-02 7.45E-03	G K
			702.50	-1.355E-03	% P	2.696E-02 7.72E-03	G K
Ag-108M		-1.1411E-02					
			722.95	-1.141E-02	%(	3.736E-02 1.11E-02	G K
			614.37	-1.695E-02	%	3.650E-02 1.11E-02	G
			433.93	5.172E-03	& P	2.367E-02 6.96E-03	G
CD-109		5.4336E-01					
			88.04	5.434E-01	%(P	1.056E+00 3.21E-01	G
SN-113		-7.0847E-03					
			391.71	-7.085E-03	%(P	3.728E-02 1.09E-02	G K
			255.04	4.090E-01	%	1.169E+00 3.52E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	7.4926E-02						
		427.95	1.593E-02	&(P	6.876E-02	2.02E-02	G K
		600.77	1.719E-02	& P	1.275E-01	3.69E-02	G
		636.15	2.538E-02	% P	2.065E-01	5.96E-02	G
		463.51	2.496E-01	*(P	2.062E-01	6.70E-02	G
		176.29	7.009E-02	& P	4.392E-01	1.31E-01	G
I-131	-7.5282E-03						
		364.48	-7.528E-03	&(	3.250E-02	9.65E-03	G K
		636.97	3.748E-02	%	3.663E-01	1.06E-01	G
		284.29	-3.052E-02	&	4.377E-01	1.29E-01	G
CS-134	1.1080E-02						
		604.66	-2.760E-04	&(P	6.151E-02	1.82E-02	G K
		795.76	2.406E-02	*(P	3.196E-02	1.00E-02	G
		569.29	-2.412E-02	%	1.829E-01	5.36E-02	G
		801.84	3.908E-02	% P	3.022E-01	8.73E-02	G
CS-137	8.2603E-02						
		661.62	8.260E-02	*(P	3.566E-02	1.57E-02	G
CE-139	9.7498E-03						
		165.85	9.750E-03	%(P	3.187E-02	9.58E-03	G
EU-152	8.3505E-03						
		121.78	8.351E-03	&(P	9.803E-02	2.93E-02	G K
		344.30	-3.484E-02	% P	9.614E-02	2.89E-02	G
		1408.08	2.307E-02	& P	1.355E-01	3.86E-02	G
		964.00	-9.100E-05	% P	3.090E-01	8.96E-02	G
		1112.07	1.225E-02	& P	2.995E-01	8.63E-02	G
		778.90	-2.463E-03	% P	2.137E-01	6.07E-02	G
EU-154	-4.3315E-03						
		123.10	-4.331E-03	%(P	7.380E-02	2.20E-02	G K
		1274.80	6.849E-04	% P	9.075E-02	2.55E-02	G
		723.30	-5.842E-02	& P	1.838E-01	5.48E-02	G
		1004.80	4.561E-02	% P	1.758E-01	5.17E-02	G
EU-155	6.0660E-02						
		86.45	6.066E-02	&(	1.348E-01	4.09E-02	G K
		105.31	5.633E-02	% P	1.384E-01	4.18E-02	G
HG-203	-1.3661E-02						
		279.17	-1.366E-02	%(P	3.276E-02	9.87E-03	G K
		72.87	-3.371E-01	% P	9.790E-01	2.96E-01	G
		70.83	-5.593E-01	%	1.689E+00	5.10E-01	G
		82.50	-6.505E-01	%	1.825E+00	5.51E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	2.1106E-01						
		583.14	2.111E-01	*(P	3.149E-02	1.55E-02	G
		510.72	3.696E-01	+ P	1.521E-01	6.69E-02	G
PB-212	4.2464E-01						
		238.63	4.124E-01	*(P	8.317E-02	2.92E-02	G K
							Energy duplication
		77.11	4.548E-01	*(	2.874E-01	9.00E-02	G
		74.81	2.071E-01	% P	6.095E-01	1.84E-01	G
PB-214	3.2099E-01						
		351.99	3.210E-01	*(P	6.936E-02	2.64E-02	G K
		295.22	2.221E-01	- P	1.431E-01	4.59E-02	G
							Energy duplication
		77.11	7.316E-01	+ P	4.708E-01	1.47E-01	G
		241.92	-3.129E-01	& P	5.704E-01	1.73E-01	G
BI-212	2.3071E-01						
		727.17	2.307E-01	(P	2.472E-01	9.43E-02	G K
		1620.56	1.161E-01	% P	6.620E-01	1.80E-01	G
		785.42	3.894E-01	% P	1.267E+00	3.74E-01	G
BI-214	2.8974E-01						
		609.32	2.776E-01	*(P	6.853E-02	2.65E-02	G K
		1764.51	3.953E-01	+ P	1.397E-01	6.43E-02	G
		1120.28	3.269E-01	*(P	3.082E-01	9.84E-02	G
RA-224	-3.8931E-01						
		241.00	-3.893E-01	&(P	9.493E-01	2.87E-01	G
RA-226	6.6826E-01						
		185.99	6.683E-01	*(	8.081E-01	2.49E-01	G
AC-228	6.1578E-01						
		911.07	5.936E-01	*(P	1.048E-01	5.21E-02	G K
		968.90	9.948E-01	+ P	2.011E-01	1.06E-01	G
		338.40	6.693E-01	*(P	2.161E-01	9.05E-02	G
TH-227	-2.8229E-01						
		236.00	-2.823E-01	?(P	3.537E-01	1.08E-01	G K
		256.25	-2.397E-02	& P	2.800E-01	8.17E-02	G
PA-234	-5.8353E-03						
		98.44	-5.835E-03	&(	1.310E-01	3.91E-02	G K
		946.00	2.837E-03	&	1.655E-01	4.74E-02	G
		131.28	5.032E-03	%	1.513E-01	4.51E-02	G
		94.67	-8.825E-02	%	2.561E-01	7.73E-02	G
		883.24	-4.371E-02	&	2.482E-01	7.24E-02	G
		926.70	4.130E-02	&	2.562E-01	7.43E-02	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26-3.574E-02 %   2.709E-01 7.94E-02 G

TH-234       1.8479E-01
                           63.29 1.848E-01 %(P 1.683E+00 5.03E-01 G K
                           92.80 7.128E-01 % P 1.325E+00 4.01E-01 G
                           92.38 9.873E-01 % P 1.561E+00 4.75E-01 G

AM-241      -5.8354E-02
                           59.54-5.835E-02 %(P 2.255E-01 6.79E-02 G
   ( - This peak used in the nuclide activity average.

   * - Peak is too wide, but only one peak in library.
   ! - Peak is part of a multiplet and this area went
       negative during deconvolution.
   ? - Peak is too narrow.
   @ - Peak is too wide at FW25M, but ok at FWHM.
   % - Peak fails sensitivity test.
   $ - Peak identified, but first peak of this nuclide
       failed one or more qualification tests.
   + - Peak activity higher than counting uncertainty range.
   - - Peak activity lower than counting uncertainty range.
   = - Peak outside analysis energy range.
   & - Calculated peak centroid is not close enough to the
       library energy centroid for positive identification.
   P - Peakbackground subtraction
   } - Peak is too close to another for the activity
       to be found directly.

   Nuclide Codes:                      Peak Codes:
   T - Thermal Neutron Activation      G - Gamma Ray
   F - Fast Neutron Activation         X - X-Ray
   I - Fission Product                 P - Positron Decay
   N - Naturally Occurring Isotope     S - Single-Escape
   P - Photon Reaction                 D - Double-Escape
   C - Charged Particle Reaction       K - Key Line
   M - No MDA Calculation              A - Not in Average
   R - Coincidence Corrected           C - Coincidence Peak
   H - Halflife limit exceeded

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
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***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	2.8600E-02	2.9300E-02	2.2320E-01	2.2320E-01	2.478E-01
K-40	#	1.4517E+01	1.4517E+01	1.1273E+00	1.4163E+00	
MN-54	#A	5.6193E-03	5.6426E-03	2.3229E-02	2.3231E-02	2.643E-02
CO-57	#B	-6.9060E-05	-6.9391E-05	1.6969E-02	1.6969E-02	3.433E-02
CO-60	#B	5.4706E-03	5.4742E-03	2.6206E-02	2.6208E-02	3.093E-02

Sr-85	#A	-8.8417E-03	-9.0196E-03	3.2947E-02	3.2952E-02	3.609E-02
Kr-85	#A	-2.3654E+02	-2.3654E+02	9.7447E+02	9.7457E+02	8.376E+02
Y-88	#B	-9.6969E-04	-9.8151E-04	5.8890E-03	5.8893E-03	8.787E-03
NB-94	#B	5.4057E-03	5.4057E-03	2.2361E-02	2.2363E-02	2.559E-02
Ag-108M	#B	-1.1411E-02	-1.1411E-02	3.3421E-02	3.3428E-02	3.736E-02
CD-109	#A	5.4181E-01	5.4336E-01	9.6157E-01	9.6204E-01	1.053E+00
SN-113	#B	-7.0056E-03	-7.0847E-03	4.4147E-02	4.4149E-02	3.686E-02
SB-125	#F	7.4831E-02	7.4926E-02	6.0363E-02	6.0525E-02	6.867E-02
I-131	#B	-6.4111E-03	-7.5282E-03	2.8951E-02	2.8955E-02	2.768E-02
CS-134	#B	1.1061E-02	1.1080E-02	1.3827E-02	1.3843E-02	6.141E-02
CS-137	#	8.2593E-02	8.2603E-02	4.7006E-02	4.7259E-02	
CE-139	#A	9.6586E-03	9.7498E-03	2.8755E-02	2.8761E-02	3.157E-02
EU-152	#B	8.3482E-03	8.3505E-03	8.7754E-02	8.7755E-02	9.801E-02
EU-154	#B	-4.3297E-03	-4.3315E-03	7.5345E-02	7.5345E-02	7.377E-02
EU-155	#B	6.0616E-02	6.0660E-02	1.2256E-01	1.2261E-01	1.347E-01
HG-203	#B	-1.3287E-02	-1.3661E-02	3.1687E-02	3.1697E-02	3.186E-02
TL-208	#	2.1106E-01	2.1106E-01	4.6389E-02	4.8035E-02	
PB-212	#	4.2464E-01	4.2464E-01	9.0119E-02	9.3544E-02	8.317E-02
PB-214	#	3.2099E-01	3.2099E-01	7.9272E-02	8.1507E-02	6.936E-02
BI-212	A	2.3071E-01	2.3071E-01	2.8272E-01	2.8305E-01	
BI-214	#	2.8974E-01	2.8974E-01	8.2886E-02	8.4634E-02	6.853E-02
RA-224	#A	-3.8931E-01	-3.8931E-01	9.2741E-01	9.2770E-01	9.493E-01
RA-226	#A	6.6826E-01	6.6826E-01	7.4695E-01	7.4799E-01	8.081E-01
AC-228	#	6.1578E-01	6.1578E-01	1.4890E-01	1.5327E-01	
TH-227	#A	-2.8229E-01	-2.8229E-01	3.2678E-01	3.2720E-01	3.537E-01
PA-234	#B	-5.8353E-03	-5.8353E-03	1.1725E-01	1.1725E-01	1.310E-01
TH-234	#B	1.8479E-01	1.8479E-01	1.5077E+00	1.5077E+00	1.683E+00
AM-241	#A	-5.8353E-02	-5.8354E-02	2.0988E-01	2.0990E-01	2.255E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (50.2 to 2000.1 keV) 1.5656890E+01 pCi/gm
Total Decayed Activity (50.2 to 2000.1 keV) 1.5656899E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JPK

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 107F_13SEPT2006_1132.An1

Sample description
FSS-OOL-05-09-006-F-RC

Spectrum Filename: C:\GammaVision\Spectra\107F_13SEPT2006_1132.An1

Acquisition information
Start time: 13-Sep-2006 11:32:17
Live time: 2000
Real time: 2002
Dead time: 0.10 %
Detector ID: 2

Detector system
Det 107- DSPE- 634

Calibration
Filename: D7_1LSa.Clb
Detector 107 Calibration for 1 Liter Sand Marinelli

Energy Calibration
Created: 29-Oct-2004 06:48:53
Zero offset: 0.157 keV
Gain: 0.500 keV/channel
Quadratic: -1.676E-08 keV/channel^2

Efficiency Calibration
Created: 29-Oct-2004 06:51:32
Type: Polynomial
Uncertainty: 1.174 %
Coefficients: -0.279532 -4.778179 0.614896
-0.087174 0.005356 -0.000131

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.16keV)
Stop channel: 4000 (2000.15keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 1.6620E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.6620E+03) =
6.0168E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	11-Sep-2006 14:10:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	107_150K_28APR05.Pbc 01-May-2005 05:30:33
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 16 cutoff 20.00000 %
Energy Calibration
Normalized diff: 1.0000

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
68.85	81.	40.12	1.05	2.491E-02				
76.10	842.	8.23	4.07	2.912E-02	74.81	9.600	2.492E+00	PB212
					77.11	10.700	2.152E+00	PB214
					77.11	17.500	1.323E+00	PB212
186.01	116.	31.63	1.50	3.610E-02	185.99	3.280	PBC<MDA	RA226
239.06	1194.	5.28	2.36	3.186E-02	238.63	43.100	6.972E-01	PB212
					241.00	3.900	7.840E+00	RA224
242.09	114.	29.43	1.30	3.163E-02	241.00	3.900	PBC<MDA	RA224
					241.92	7.470	3.923E-01	PB214
295.15	199.	12.67	1.34	2.768E-02	295.22	19.200	2.970E-01	PB214
300.47	70.	29.03	1.34	2.733E-02				
338.56	252.	12.93	2.02	2.499E-02	338.40	12.010	6.725E-01	AC228
352.02	498.	7.16	2.47	2.426E-02	351.99	37.100	4.457E-01	PB214
463.24	59.	30.90	1.68	1.954E-02				
463.24	59.	30.90	1.68	1.954E-02	463.51	10.000	PBC<MDA	SB125
511.09	189.	16.93	1.50	1.807E-02	510.72	22.500	3.113E-01	TL208
583.37	396.	7.12	2.36	1.628E-02	583.14	86.000	2.274E-01	TL208
609.52	326.	8.80	2.48	1.574E-02	609.32	46.090	3.610E-01	BI214
662.08	146.	17.46	2.37	1.476E-02	661.62	84.620	9.269E-02	CS137
726.92	99.	25.53	2.09	1.374E-02	727.17	11.800	4.980E-01	BI212
795.24	43.	31.93	1.68	1.284E-02	795.76	85.400	PBC<MDA	CS134
911.20	250.	9.78	1.60	1.161E-02	911.07	29.000	5.948E-01	AC228
968.25	206.	11.93	1.91	1.110E-02	968.90	17.460	8.533E-01	AC228
1120.45	61.	24.85	1.90	9.970E-03	1120.28	15.040	3.318E-01	BI214
1460.92	1541.	2.59	2.83	8.190E-03	1460.75	10.700	1.425E+01	K40
1764.62	44.	19.97	2.29	7.084E-03	1764.51	15.920	3.204E-01	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
600.56	300.41	172.	70.	0.035	87.08	1.341	PB-212	lD
1218.62	609.52	315.	154.	0.077	54.41	2.485	BI-214	s

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-212	149.29	74.81	687.	228.	0.114	51.82	1.178D
PB-212	153.89	77.11	746.	247.	0.123	40.40	1.179A
RA-226	371.67	186.01	613.	116.	0.058	94.89	1.500s
PB-212	476.89	238.63	516.	656.	0.328	18.27	1.297D
PB-214	483.47	241.92	521.	114.	0.057	88.29	1.299D
PB-214	589.80	295.09	365.	233.	0.117	44.49	1.898s
AC-228	676.74	338.56	264.	248.	0.124	38.80	2.023s
PB-214	703.66	352.02	240.	493.	0.247	21.47	2.469s
SB-125	926.73	463.57	137.	49.	0.025	102.91	1.500s
TL-208	1021.77	511.09	238.	156.	0.078	50.79	1.498s
TL-208	1166.32	583.37	122.	392.	0.196	21.36	2.357s
BI-214	1218.31	609.37	149.	220.	0.110	30.24	1.558s
CS-137	1323.73	662.08	130.	142.	0.071	52.39	2.373s
BI-212	1453.41	726.92	138.	99.	0.050	76.60	2.093s
CS-134	1590.05	795.24	77.	43.	0.022	95.80	1.684s
AC-228	1821.96	911.20	99.	246.	0.123	29.34	1.603s
AC-228	1936.06	968.25	104.	203.	0.102	35.80	1.910s
BI-214	2240.47	1120.45	89.	61.	0.031	74.54	1.897s
K-40	2921.44	1460.92	18.	1536.	0.768	7.77	2.831s
BI-214	3528.88	1764.62	19.	44.	0.022	59.91	2.291s

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	MDA Value pCi/gm	COMMENTS
BE-7		7.5069E-02					
			477.56	7.507E-02	%(	2.507E-01 7.47E-02	G
K-40		1.4254E+01					
			1460.75	1.425E+01	*(P	2.061E-01 3.71E-01	G
MN-54		-5.5555E-03					
			834.81	-5.556E-03	%(P	3.212E-02 9.37E-03	G
CO-57		8.5376E-03					
			122.07	8.538E-03	%(P	3.298E-02 9.91E-03	G K
			136.43	6.945E-02	% P	2.445E-01 7.35E-02	G
CO-60		1.4555E-02					
			1332.51	1.456E-02	%(P	2.769E-02 8.28E-03	G K
			1173.23	1.636E-02	% P	4.133E-02 1.23E-02	G K
Sr-85		-1.1334E-02					
			514.00	-1.133E-02	%(	3.459E-02 1.04E-02	G
Kr-85		-2.8790E+02					
			513.99	-2.879E+02	%(P	7.873E+02 2.35E+02	G
Y-88		1.2194E-03					
			1836.01	1.219E-03	&(P	1.973E-02 5.02E-03	G K
			898.02	9.939E-04	% P	3.037E-02 8.60E-03	G
NB-94		-1.2261E-02					
			871.10	-1.226E-02	%(P	3.086E-02 9.26E-03	G K
			702.50	3.507E-03	% P	2.891E-02 8.41E-03	G K
Ag-108M		0.0000E+00					
			722.95	0.000E+00	&(	5.070E-02 1.49E-02	G K
			614.37	-3.024E-02	%	4.216E-02 1.30E-02	G
			433.93	6.838E-03	& P	2.739E-02 8.12E-03	G
CD-109		1.6924E-01					
			88.04	1.692E-01	%(P	1.114E+00 3.34E-01	G
SN-113		-3.5161E-03					
			391.71	-3.516E-03	%(P	3.722E-02 1.08E-02	G K
			255.04	-3.066E-01	&	1.198E+00 3.58E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	3.8962E-02						
		427.95	-1.755E-02	%(P	8.530E-02	2.51E-02	G K
		600.77	-4.141E-03	& P	1.493E-01	4.28E-02	G
		636.15	-1.177E-03	& P	2.022E-01	5.73E-02	G
		463.51	2.062E-01	*(P	2.391E-01	7.48E-02	G
		176.29	7.827E-02	& P	3.860E-01	1.15E-01	G
I-131	-9.8899E-05						
		364.48	-9.890E-05	&(	3.240E-02	9.43E-03	G K
		636.97	2.128E-02	&	3.932E-01	1.13E-01	G
		284.29	-1.075E-01	&	4.974E-01	1.48E-01	G
CS-134	1.4869E-02						
		604.66	-2.760E-04	%(P	5.929E-02	1.76E-02	G K
		795.76	3.218E-02	*(P	3.232E-02	1.04E-02	G
		569.29	7.938E-02	&	1.313E-01	4.05E-02	G
		801.84	-8.392E-02	% P	3.289E-01	9.68E-02	G
CS-137	9.2687E-02						
		661.62	9.269E-02	*(P	3.627E-02	1.66E-02	G
CE-139	1.9864E-03						
		165.85	1.986E-03	&(P	2.998E-02	8.90E-03	G
EU-152	2.4961E-02						
		121.78	2.496E-02	%(P	9.859E-02	2.96E-02	G K
		344.30	-1.954E-02	% P	9.572E-02	2.84E-02	G
		1408.08	1.951E-02	% P	1.207E-01	3.40E-02	G
		964.00	-1.062E-01	& P	3.214E-01	9.62E-02	G
		1112.07	3.239E-02	% P	2.336E-01	6.73E-02	G
		778.90	-3.097E-02	% P	2.198E-01	6.37E-02	G
EU-154	2.2681E-02						
		123.10	2.268E-02	&(P	6.424E-02	1.94E-02	G K
		1274.80	-1.681E-02	% P	1.001E-01	2.89E-02	G
		723.30	-4.353E-02	& P	1.889E-01	5.59E-02	G
		1004.80	-4.089E-02	& P	1.914E-01	5.60E-02	G
EU-155	4.5773E-02						
		86.45	4.577E-02	&(	1.295E-01	3.91E-02	G K
		105.31	3.755E-02	& P	1.302E-01	3.92E-02	G
HG-203	6.9651E-03						
		279.17	6.965E-03	%(P	3.184E-02	9.49E-03	G K
		72.87	-5.902E-01	% P	8.510E-01	2.60E-01	G
		70.83	-7.127E-01	&	1.636E+00	4.95E-01	G
		82.50	-3.431E-01	%	1.803E+00	5.41E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	2.2743E-01						
		583.14	2.274E-01	*(P	3.146E-02	1.64E-02	G
		510.72	3.113E-01	+ P	1.492E-01	6.41E-02	G
PB-212	3.8784E-01						
		238.63	3.878E-01	(P	6.423E-02	2.42E-02	G K
							Energy duplication
		77.11	3.878E-01	}	2.042E-01	5.22E-02	G
		74.81	6.765E-01	+ P	3.712E-01	1.19E-01	G
PB-214	4.3672E-01						
		351.99	4.457E-01	*(P	6.763E-02	3.22E-02	G K
		295.22	3.572E-01	- P	1.403E-01	5.40E-02	G
							Energy duplication
		77.11	2.091E-01	} P	4.193E-01	1.17E-01	G
		241.92	3.923E-01	(P	3.753E-01	1.17E-01	G
BI-212	4.9795E-01						
		727.17	4.980E-01	*(P	2.878E-01	1.29E-01	G K
		1620.56	1.599E-01	% P	6.992E-01	1.95E-01	G
		785.42	4.062E-01	% P	1.341E+00	3.96E-01	G
BI-214	2.7873E-01						
		609.32	2.470E-01	*(P	6.668E-02	2.54E-02	G K
		1764.51	3.204E-01	@(P	1.668E-01	6.53E-02	G
		1120.28	3.318E-01	(P	2.528E-01	8.36E-02	G
RA-224	-5.7642E-04						
		241.00	-5.764E-04	&(P	1.061E+00	3.16E-01	G
RA-226	7.9551E-01						
		185.99	7.955E-01	*(	8.111E-01	2.52E-01	G
AC-228	6.1758E-01						
		911.07	5.948E-01	*(P	1.184E-01	5.92E-02	G K
		968.90	8.533E-01	+ P	2.106E-01	1.03E-01	G
		338.40	6.725E-01	*(P	2.122E-01	8.81E-02	G
TH-227	-6.1822E-04						
		236.00	-6.182E-04	%(P	3.786E-01	1.13E-01	G K
		256.25	7.461E-02	% P	3.587E-01	1.07E-01	G
PA-234	-1.3965E-03						
		98.44	-1.396E-03	%(	1.206E-01	3.59E-02	G K
		946.00	-4.385E-02	%	1.681E-01	4.97E-02	G
		131.28	-4.237E-02	%	1.451E-01	4.37E-02	G
		94.67	-1.120E-01	%	2.314E-01	7.02E-02	G
		883.24	4.095E-03	%	1.894E-01	5.30E-02	G
		926.70	3.865E-02	%	2.268E-01	6.55E-02	G

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 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26 1.177E-01 &   1.944E-01 5.99E-02 G

TH-234       4.7574E-01
                           63.29 4.757E-01 %(P 1.549E+00 4.65E-01 G K
                           92.80 6.980E-01 % P 1.274E+00 3.86E-01 G
                           92.38 8.669E-01 % P 1.525E+00 4.63E-01 G

AM-241       5.7284E-03
                           59.54 5.728E-03 %(P 2.080E-01 6.20E-02 G
   ( - This peak used in the nuclide activity average.

   * - Peak is too wide, but only one peak in library.
   ! - Peak is part of a multiplet and this area went
       negative during deconvolution.
   ? - Peak is too narrow.
   @ - Peak is too wide at FW25M, but ok at FWHM.
   % - Peak fails sensitivity test.
   $ - Peak identified, but first peak of this nuclide
       failed one or more qualification tests.
   + - Peak activity higher than counting uncertainty range.
   - - Peak activity lower than counting uncertainty range.
   = - Peak outside analysis energy range.
   & - Calculated peak centroid is not close enough to the
       library energy centroid for positive identification.
   P - Peakbackground subtraction
   } - Peak is too close to another for the activity
       to be found directly.

   Nuclide Codes:                      Peak Codes:
   T - Thermal Neutron Activation      G - Gamma Ray
   F - Fast Neutron Activation         X - X-Ray
   I - Fission Product                 P - Positron Decay
   N - Naturally Occurring Isotope     S - Single-Escape
   P - Photon Reaction                 D - Double-Escape
   C - Charged Particle Reaction       K - Key Line
   M - No MDA Calculation              A - Not in Average
   R - Coincidence Corrected           C - Coincidence Peak
   H - Halflife limit exceeded

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***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	7.3249E-02	7.5069E-02	2.2423E-01	2.2427E-01	2.446E-01
K-40	#	1.4254E+01	1.4254E+01	1.1115E+00	1.3943E+00	
MN-54	#A	-5.5322E-03	-5.5555E-03	3.1138E-02	3.1140E-02	3.199E-02
CO-57	#B	8.4963E-03	8.5376E-03	2.9729E-02	2.9733E-02	3.282E-02
CO-60	#B	1.4545E-02	1.4555E-02	2.4854E-02	2.4869E-02	2.767E-02

Sr-85	#A	-1.1108E-02	-1.1334E-02	3.1118E-02	3.1125E-02	3.390E-02
Kr-85	#A	-2.8789E+02	-2.8790E+02	8.7668E+02	8.7684E+02	7.873E+02
Y-88	#B	1.2045E-03	1.2194E-03	1.5075E-02	1.5075E-02	1.949E-02
NB-94	#B	-1.2261E-02	-1.2261E-02	2.8191E-02	2.8200E-02	3.086E-02
Ag-108M	#B	0.0000E+00	0.0000E+00	4.4552E-02	4.4552E-02	5.070E-02
CD-109	#A	1.6875E-01	1.6924E-01	1.0030E+00	1.0031E+00	1.111E+00
SN-113	#B	-3.4763E-03	-3.5161E-03	5.9856E-02	5.9857E-02	3.680E-02
SB-125	#B	3.8912E-02	3.8962E-02	4.2375E-02	4.2438E-02	8.519E-02
I-131	#B	-8.4026E-05	-9.8899E-05	2.8277E-02	2.8277E-02	2.753E-02
CS-134	#B	1.4843E-02	1.4869E-02	1.4419E-02	1.4445E-02	5.919E-02
CS-137	#	9.2676E-02	9.2687E-02	4.9760E-02	5.0060E-02	
CE-139	#A	1.9675E-03	1.9864E-03	2.6710E-02	2.6711E-02	2.970E-02
EU-152	#B	2.4954E-02	2.4961E-02	8.8874E-02	8.8884E-02	9.856E-02
EU-154	#B	2.2672E-02	2.2681E-02	5.8103E-02	5.8116E-02	6.421E-02
EU-155	#B	4.5740E-02	4.5773E-02	1.1739E-01	1.1741E-01	1.294E-01
HG-203	#B	6.7720E-03	6.9651E-03	2.8482E-02	2.8485E-02	3.096E-02
TL-208	#	2.2743E-01	2.2743E-01	4.9132E-02	5.0935E-02	
PB-212		3.8784E-01	3.8784E-01	7.2569E-02	7.6098E-02	
PB-214		4.3672E-01	4.3672E-01	9.4747E-02	9.8195E-02	
BI-212	#	4.9795E-01	4.9795E-01	3.8639E-01	3.8750E-01	
BI-214	#	2.7873E-01	2.7873E-01	8.5943E-02	8.7506E-02	6.668E-02
RA-224	#A	-5.7642E-04	-5.7642E-04	1.0265E+00	1.0265E+00	1.061E+00
RA-226	#A	7.9551E-01	7.9551E-01	7.5483E-01	7.5629E-01	8.111E-01
AC-228	#	6.1758E-01	6.1758E-01	1.5238E-01	1.5669E-01	
TH-227	#B	-6.1822E-04	-6.1822E-04	1.8541E-01	1.8541E-01	3.786E-01
PA-234	#B	-1.3965E-03	-1.3965E-03	1.0760E-01	1.0760E-01	1.206E-01
TH-234	#B	4.7574E-01	4.7574E-01	1.3953E+00	1.3956E+00	1.549E+00
AM-241	#A	5.7284E-03	5.7284E-03	1.8605E-01	1.8605E-01	2.080E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (295.2 to 2000.1 keV) 1.6514406E+01 pCi/gm
Total Decayed Activity (295.2 to 2000.1 keV) 1.6514418E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JPK

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 107F_13SEPT2006_1254.An1

Sample description
FSS-OOL-05-09-010-F

Spectrum Filename: C:\GammaVision\Spectra\107F_13SEPT2006_1254.An1

Acquisition information
Start time: 13-Sep-2006 12:54:23
Live time: 2000
Real time: 2002
Dead time: 0.12 %
Detector ID: 2

Detector system
Det 107- DSPE- 634

Calibration
Filename: D7_1LSa.Clb
Detector 107 Calibration for 1 Liter Sand Marinelli

Energy Calibration
Created: 29-Oct-2004 06:48:53
Zero offset: 0.157 keV
Gain: 0.500 keV/channel
Quadratic: -1.676E-08 keV/channel^2

Efficiency Calibration
Created: 29-Oct-2004 06:51:32
Type: Polynomial
Uncertainty: 1.174 %
Coefficients: -0.279532 -4.778179 0.614896
-0.087174 0.005356 -0.000131

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.16keV)
Stop channel: 4000 (2000.15keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 1.7760E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.7760E+03) =
5.6306E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	11-Sep-2006 14:13:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	107_150K_28APR05.Pbc 01-May-2005 05:30:33
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 13 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.4978

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
75.86	252.	26.03	1.50	2.849E-02	74.81	9.600	7.008E-01	PB212
					77.11	10.700	6.058E-01	PB214
					77.11	17.500	PBC<MDA	PB212
76.55	259.	24.35	1.50	2.957E-02	74.81	9.600	7.194E-01	PB212
					77.11	10.700	6.219E-01	PB214
					77.11	17.500	PBC<MDA	PB212
76.55	263.	24.35	1.50	2.957E-02	74.81	9.600	7.219E-01	PB212
					77.11	10.700	6.219E-01	PB214
					77.11	17.500	3.872E-01	PB212
186.16	139.	29.74	1.50	3.610E-02	185.99	3.280	8.903E-01	RA226
209.41	128.	27.51	2.33	3.428E-02				
239.23	1641.	4.07	2.39	3.185E-02	236.00	11.200	3.472E+00	TH227
					238.63	43.100	8.996E-01	PB212
					241.00	3.900	1.008E+01	RA224
295.21	194.	13.51	1.34	2.768E-02				
295.21	194.	13.51	1.34	2.768E-02	295.22	19.200	2.715E-01	PB214
300.21	72.	30.85	1.34	2.734E-02				
338.15	254.	13.29	1.66	2.502E-02	338.40	12.010	6.360E-01	AC228
352.03	557.	6.67	1.38	2.426E-02	351.99	37.100	4.665E-01	PB214
462.77	60.	30.04	1.50	1.953E-02	463.51	10.000	2.353E-01	SB125
511.24	202.	12.79	3.15	1.808E-02	510.72	22.500	3.781E-01	TL208
					513.99	0.004	1.988E+03	Kr85
					514.00	99.270	PBC<MDA	Sr85
583.14	505.	7.19	2.80	1.629E-02	583.14	86.000	2.716E-01	TL208
609.59	489.	7.60	2.24	1.574E-02	609.32	46.090	5.084E-01	BI214
661.79	35.	40.75	1.11	1.477E-02	661.62	84.620	PBC<MDA	CS137
726.98	137.	14.40	1.86	1.375E-02	727.17	11.800	6.368E-01	BI212

795.16	46.	32.06	1.68	1.284E-02	795.76	85.400	PBC<MDA	CS134
911.37	372.	9.51	2.35	1.161E-02	911.07	29.000	8.308E-01	AC228

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
967.95	254.	12.23	1.85	1.110E-02	968.90	17.460	9.899E-01	AC228
1120.23	140.	17.50	3.33	9.970E-03	1120.28	15.040	7.110E-01	BI214
1460.92	1760.	2.46	2.96	8.190E-03	1460.75	10.700	1.524E+01	K40
1621.53	30.	19.62	1.05	7.569E-03	1620.56	2.750	1.115E+00	BI212
1765.09	106.	10.50	0.88	7.082E-03	1764.51	15.920	7.105E-01	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
418.45	209.41	488.	128.	0.064	82.53	2.332	AC-228	s
478.10	239.23	1741.	705.	0.352	27.54	2.393	PB-212	s
600.05	300.17	207.	72.	0.036	92.54	1.341	PB-212	lD
703.68	352.03	696.	144.	0.072	81.41	1.385	PB-214	s
1323.15	661.79	79.	35.	0.017	122.26	1.107	CS-137	l

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-212	151.40	75.86	2093.	252.	0.126	78.09	1.500s
PB-214	153.89	77.11	1930.	259.	0.129	73.06	1.500D
PB-212	153.89	77.11	1926.	263.	0.132	73.06	1.500D
RA-226	371.96	186.16	780.	139.	0.069	89.22	1.500s
PB-212	477.08	238.72	1162.	928.	0.464	18.09	1.500s
PB-214	590.15	295.26	516.	165.	0.083	61.06	1.500s
AC-228	675.91	338.15	320.	251.	0.125	39.87	1.658s
PB-214	703.75	352.07	342.	407.	0.204	23.97	1.500s
SB-125	925.14	462.77	151.	60.	0.030	90.12	1.500s
TL-208	1022.06	511.24	221.	202.	0.101	38.37	3.147s
TL-208	1165.87	583.14	203.	500.	0.250	21.58	2.802s
BI-214	1218.76	609.59	212.	485.	0.242	22.81	2.243s
BI-212	1453.54	726.98	91.	136.	0.068	43.19	1.858s
CS-134	1589.89	795.16	89.	46.	0.023	96.18	1.684s
AC-228	1822.30	911.37	176.	368.	0.184	28.53	2.353s
AC-228	1935.45	967.95	157.	252.	0.126	36.69	1.847s
BI-214	2240.02	1120.23	118.	140.	0.070	52.51	3.332s
K-40	2921.43	1460.92	30.	1755.	0.878	7.38	2.958s
BI-212	3242.68	1621.53	3.	30.	0.015	58.87	1.045s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
BI-214	3529.83	1765.09	5.	105.	0.053	31.51	0.881s

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Activity pCi/gm	Code	MDA Value pCi/gm	COMMENTS
BE-7		-1.9018E-02					
			477.56	-1.902E-02	&(	2.393E-01	6.99E-02 G
K-40		1.5237E+01					
			1460.75	1.524E+01	*(P	2.449E-01	3.76E-01 G
MN-54		1.1648E-02					
			834.81	1.165E-02	%(P	2.739E-02	8.24E-03 G
CO-57		-4.8586E-03					
			122.07	-4.859E-03	&(P	3.296E-02	9.87E-03 G K
			136.43	8.502E-02	% P	2.739E-01	8.26E-02 G
CO-60		6.7626E-03					
			1332.51	6.763E-03	%(P	3.131E-02	8.96E-03 G K
			1173.23	-1.493E-02	% P	4.603E-02	1.35E-02 G K
Sr-85		-1.7794E-02					
			514.00	-1.779E-02	%(	3.692E-02	1.12E-02 G
Kr-85		-4.3197E+02					
			513.99	-4.320E+02	%(P	8.387E+02	2.53E+02 G
Y-88		-5.6668E-03					
			1836.01	-5.667E-03	%(P	2.714E-02	7.53E-03 G K
			898.02	5.401E-04	& P	3.564E-02	1.02E-02 G
NB-94		5.1957E-03					
			871.10	5.196E-03	&(P	2.700E-02	7.88E-03 G K
			702.50	3.191E-03	% P	2.360E-02	6.83E-03 G K
Ag-108M		0.0000E+00					
			722.95	0.000E+00	%(	5.825E-02	1.72E-02 G K
			614.37	-1.737E-02	%	4.111E-02	1.24E-02 G
			433.93	-4.078E-03	% P	2.627E-02	7.69E-03 G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CD-109	1.1598E-01						
		88.04	1.160E-01	%(P	1.162E+00	3.49E-01	G
SN-113	-5.0660E-03						
		391.71	-5.066E-03	%(P	3.468E-02	1.01E-02	G K
		255.04	-1.931E-01	%	1.243E+00	3.71E-01	G
SB-125	4.9754E-02						
		427.95	-1.293E-02	&(P	8.020E-02	2.35E-02	G K
		600.77	1.787E-02	& P	1.263E-01	3.67E-02	G
		636.15	4.687E-02	% P	1.851E-01	5.43E-02	G
		463.51	2.353E-01	*(P	2.340E-01	7.40E-02	G
		176.29	8.150E-02	% P	4.370E-01	1.31E-01	G
I-131	4.7317E-03						
		364.48	4.732E-03	&(	3.141E-02	9.27E-03	G K
		636.97	1.721E-02	%	3.390E-01	9.69E-02	G
		284.29	-1.595E-01	%	4.920E-01	1.48E-01	G
CS-134	1.4824E-02						
		604.66	-2.583E-04	&(P	6.509E-02	1.93E-02	G K
		795.76	3.206E-02	*(P	3.245E-02	1.04E-02	G
		569.29	1.723E-02	%	1.735E-01	5.07E-02	G
		801.84	-1.706E-02	% P	2.999E-01	8.59E-02	G
CS-137	1.7807E-02						
		661.62	1.781E-02	%(P	3.502E-02	1.06E-02	G
CE-139	5.3209E-03						
		165.85	5.321E-03	&(P	3.339E-02	9.99E-03	G
EU-152	9.5113E-05						
		121.78	9.511E-05	&(P	8.818E-02	2.62E-02	G K
		344.30	-2.464E-04	% P	8.375E-02	2.44E-02	G
		1408.08	3.263E-03	% P	1.244E-01	3.43E-02	G
		964.00	-3.190E-03	& P	3.744E-01	1.10E-01	G
		1112.07	1.262E-02	& P	1.943E-01	5.49E-02	G
		778.90	-2.305E-03	% P	2.913E-01	8.46E-02	G
EU-154	-6.8740E-04						
		123.10	-6.874E-04	%(P	7.038E-02	2.09E-02	G K
		1274.80	-1.471E-02	& P	1.055E-01	3.05E-02	G
		723.30	-4.359E-02	% P	1.885E-01	5.59E-02	G
		1004.80	4.290E-02	& P	1.767E-01	5.20E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
EU-155	7.9920E-02						
		86.45	7.992E-02	%(	1.332E-01	4.05E-02	G K
		105.31	1.397E-04	% P	1.533E-01	4.57E-02	G
HG-203	-5.9932E-04						
		279.17	-5.993E-04	&(P	3.111E-02	9.16E-03	G K
		72.87	-1.304E-01	% P	9.616E-01	2.89E-01	G
		70.83	-4.172E-01	&	1.737E+00	5.24E-01	G
		82.50	-9.754E-01	%	2.065E+00	6.26E-01	G
TL-208	2.7160E-01						
		583.14	2.716E-01	*(P	3.753E-02	1.97E-02	G
		510.72	3.781E-01	+ P	1.346E-01	5.64E-02	G
PB-212	5.1346E-01						
		238.63	5.135E-01	*(P	8.943E-02	3.15E-02	G K
							Energy duplication
		77.11	3.872E-01	-	3.046E-01	9.43E-02	G
		74.81	7.008E-01	+ P	6.005E-01	1.85E-01	G
PB-214	3.4443E-01						
		351.99	3.444E-01	*(P	7.517E-02	2.79E-02	G K
		295.22	2.366E-01	- P	1.555E-01	4.95E-02	G
							Energy duplication
		77.11	6.219E-01	+ P	4.988E-01	1.54E-01	G
		241.92	-2.811E-01	% P	6.305E-01	1.91E-01	G
BI-212	6.3678E-01						
		727.17	6.368E-01	*(P	2.216E-01	9.25E-02	G K
		1620.56	1.115E+00	+ P	3.685E-01	2.22E-01	G
		785.42	6.022E-01	% P	1.470E+00	4.41E-01	G
BI-214	5.0839E-01						
		609.32	5.084E-01	*(P	7.404E-02	3.90E-02	G K
		1764.51	7.105E-01	+ P	8.642E-02	7.53E-02	G
		1120.28	7.110E-01	+ P	2.705E-01	1.25E-01	G
RA-224	-5.8392E-02						
		241.00	-5.839E-02	&(P	1.146E+00	3.43E-01	G
RA-226	8.9026E-01						
		185.99	8.903E-01	*(	8.535E-01	2.65E-01	G
AC-228	8.9060E-01						
		911.07	8.308E-01	*(P	1.460E-01	7.99E-02	G K
		968.90	9.899E-01	*(P	2.401E-01	1.22E-01	G
		338.40	6.360E-01	- P	2.181E-01	8.56E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TH-227	9.8292E-02						
		236.00	9.829E-02	%(P	3.998E-01	1.20E-01	G K
		256.25	-3.470E-02	& P	3.791E-01	1.12E-01	G
PA-234	-4.8584E-02						
		98.44	-4.858E-02	%(	1.186E-01	3.59E-02	G K
		946.00	-2.372E-02	&	1.542E-01	4.49E-02	G
		131.28	-1.208E-03	&	1.563E-01	4.66E-02	G
		94.67	1.288E-04	%	2.548E-01	7.62E-02	G
		883.24	6.650E-02	&	2.116E-01	6.27E-02	G
		926.70	8.986E-02	%	2.519E-01	7.52E-02	G
		569.26	2.552E-02	%	2.569E-01	7.51E-02	G
TH-234	4.9687E-01						
		63.29	4.969E-01	&(P	1.701E+00	5.12E-01	G K
		92.80	4.123E-01	% P	1.373E+00	4.13E-01	G
		92.38	6.172E-01	% P	1.572E+00	4.75E-01	G
AM-241	-1.2764E-02						
		59.54	-1.276E-02	%(P	2.223E-01	6.65E-02	G

(- This peak used in the nuclide activity average.

* - Peak is too wide, but only one peak in library.
! - Peak is part of a multiplet and this area went negative during deconvolution.
? - Peak is too narrow.
@ - Peak is too wide at FW25M, but ok at FWHM.
% - Peak fails sensitivity test.
$ - Peak identified, but first peak of this nuclide failed one or more qualification tests.
\+ - Peak activity higher than counting uncertainty range.
\- - Peak activity lower than counting uncertainty range.
= - Peak outside analysis energy range.
& - Calculated peak centroid is not close enough to the library energy centroid for positive identification.
P - Peakbackground subtraction
} - Peak is too close to another for the activity to be found directly.

Nuclide Codes:	Peak Codes:
T - Thermal Neutron Activation	G - Gamma Ray
F - Fast Neutron Activation	X - X-Ray
I - Fission Product	P - Positron Decay
N - Naturally Occurring Isotope	S - Single-Escape
P - Photon Reaction	D - Double-Escape
C - Charged Particle Reaction	K - Key Line
M - No MDA Calculation	A - Not in Average

R - Coincidence Corrected C - Coincidence Peak
H - Halflife limit exceeded

- -

***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	-1.8544E-02	-1.9018E-02	2.0969E-01	2.0970E-01	2.333E-01
K-40	#	1.5237E+01	1.5237E+01	1.1280E+00	1.4430E+00	
MN-54	#A	1.1598E-02	1.1648E-02	2.4727E-02	2.4737E-02	2.727E-02
CO-57	#B	-4.8344E-03	-4.8586E-03	3.0398E-02	3.0400E-02	3.280E-02
CO-60	#B	6.7578E-03	6.7626E-03	2.6878E-02	2.6881E-02	3.129E-02
Sr-85	#A	-1.7428E-02	-1.7794E-02	3.3593E-02	3.3609E-02	3.616E-02
Kr-85	#A	-4.3197E+02	-4.3197E+02	8.7066E+02	8.7104E+02	8.387E+02
Y-88	#B	-5.5956E-03	-5.6668E-03	3.1328E-02	3.1329E-02	2.680E-02
NB-94	#B	5.1957E-03	5.1957E-03	2.3642E-02	2.3644E-02	2.700E-02
Ag-108M	#B	0.0000E+00	0.0000E+00	5.1526E-02	5.1526E-02	5.824E-02
CD-109	#A	1.1564E-01	1.1598E-01	1.0459E+00	1.0459E+00	1.159E+00
SN-113	#B	-5.0070E-03	-5.0660E-03	4.4913E-02	4.4914E-02	3.427E-02
SB-125	#B	4.9688E-02	4.9754E-02	4.6931E-02	4.7023E-02	8.009E-02
I-131	#B	4.0011E-03	4.7317E-03	2.7798E-02	2.7799E-02	2.656E-02
CS-134	#B	1.4798E-02	1.4824E-02	1.4421E-02	1.4448E-02	6.498E-02
CS-137	#A	1.7805E-02	1.7807E-02	3.1762E-02	3.1779E-02	3.502E-02
CE-139	#A	5.2690E-03	5.3209E-03	2.9972E-02	2.9973E-02	3.307E-02
EU-152	#B	9.5085E-05	9.5113E-05	7.8587E-02	7.8587E-02	8.815E-02
EU-154	#B	-6.8710E-04	-6.8740E-04	1.4308E-01	1.4308E-01	7.035E-02
EU-155	#B	7.9861E-02	7.9920E-02	1.2160E-01	1.2168E-01	1.331E-01
HG-203	#B	-5.8223E-04	-5.9932E-04	1.6957E-01	1.6957E-01	3.023E-02
TL-208	#	2.7160E-01	2.7160E-01	5.9155E-02	6.1291E-02	
PB-212	#	5.1346E-01	5.1346E-01	9.4463E-02	9.9211E-02	8.943E-02
PB-214	#	3.4443E-01	3.4443E-01	8.3610E-02	8.6049E-02	7.517E-02
BI-212		6.3678E-01	6.3678E-01	2.7763E-01	2.8017E-01	
BI-214	#	5.0839E-01	5.0839E-01	1.1700E-01	1.2080E-01	
RA-224	#A	-5.8392E-02	-5.8392E-02	1.6609E+00	1.6609E+00	1.146E+00
RA-226	#	8.9026E-01	8.9026E-01	7.9432E-01	7.9606E-01	8.535E-01
AC-228	#	8.9060E-01	8.9060E-01	2.0899E-01	2.1551E-01	
TH-227	#B	9.8292E-02	9.8292E-02	3.6135E-01	3.6140E-01	3.998E-01
PA-234	#B	-4.8584E-02	-4.8584E-02	1.0765E-01	1.0769E-01	1.186E-01
TH-234	#B	4.9687E-01	4.9687E-01	1.5348E+00	1.5351E+00	1.701E+00
AM-241	#A	-1.2764E-02	-1.2764E-02	2.2732E-01	2.2733E-01	2.223E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.

H - Halflife limit exceeded

YAEC Chemistry Lab Spectrum name: 107F_13SEPT2006_1254.An1

---------- S U M M A R Y ----------

Total Activity (50.2 to 2000.1 keV) 1.7544432E+01 pCi/gm
Total Decayed Activity (50.2 to 2000.1 keV) 1.7544432E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JPK

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 107F_13SEPT2006_1334.An1

Sample description
FSS-OOL-05-09-018-F

Spectrum Filename: C:\GammaVision\Spectra\107F_13SEPT2006_1334.An1

Acquisition information

Start time:	13-Sep-2006 13:33:56
Live time:	2000
Real time:	2002
Dead time:	0.08 %
Detector ID:	2

Detector system
Det 107- DSPE- 634

Calibration

Filename:	D7_1LSa.Clb

Detector 107 Calibration for 1 Liter Sand Marinelli

Energy Calibration

Created:	29-Oct-2004 06:48:53
Zero offset:	0.157 keV
Gain:	0.500 keV/channel
Quadratic:	-1.676E-08 keV/channel^2

Efficiency Calibration

Created:	29-Oct-2004 06:51:32
Type:	Polynomial
Uncertainty:	1.174 %
Coefficients:	-0.279532 -4.778179 0.614896
	-0.087174 0.005356 -0.000131

Library Files

Main analysis library:	FSS_Rev_1.Lib
Library Match Width:	1.000
Peak stripping:	Library based

Analysis parameters

Analysis engine:	Env32 G53W4.20
Start channel:	100 (50.16keV)
Stop channel:	4000 (2000.15keV)
Peak rejection level:	41.667%
Peak search sensitivity:	3
Sample Size:	1.5140E+03
Activity scaling factor:	1.0000E+06/(1.0000E+00* 1.5140E+03) = 6.6050E+02
Detection limit method:	Nureg 4.16
Random error:	1.0000000E+00
Systematic error:	1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	11-Sep-2006 14:59:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	107_150K_28APR05.Pbc 01-May-2005 05:30:33
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 14 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.0339

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
76.27	509.	11.35	3.57	2.919E-02	72.87	6.400	2.651E+00	HG203
					74.81	9.600	1.648E+00	PB212
					77.11	17.500	8.778E-01	PB212
					77.11	10.700	1.422E+00	PB214
185.69	133.	26.20	1.65	3.612E-02				
185.69	133.	26.20	1.65	3.612E-02	185.99	3.280	1.003E+00	RA226
239.20	870.	5.58	2.50	3.185E-02	238.63	43.100	5.548E-01	PB212
					241.00	3.900	6.266E+00	RA224
241.99	90.	31.81	1.30	3.163E-02	241.00	3.900	PBC<MDA	RA224
					241.92	7.470	PBC<MDA	PB214
295.14	185.	15.07	1.88	2.768E-02	295.22	19.200	3.028E-01	PB214
337.96	224.	14.86	2.86	2.503E-02	338.40	12.010	6.550E-01	AC228
351.81	387.	9.02	2.48	2.427E-02	351.99	37.100	3.783E-01	PB214
510.90	152.	14.48	2.15	1.808E-02	510.72	22.500	2.594E-01	TL208
583.47	264.	9.56	2.44	1.628E-02	583.14	86.000	1.653E-01	TL208
609.47	257.	10.30	2.35	1.574E-02	609.32	46.090	3.108E-01	BI214
662.12	136.	13.55	2.08	1.476E-02	661.62	84.620	9.475E-02	CS137
726.87	65.	27.53	1.60	1.375E-02	727.17	11.800	3.496E-01	BI212
911.34	179.	10.25	1.92	1.161E-02	911.07	29.000	4.623E-01	AC228
967.63	129.	15.31	1.91	1.110E-02	968.90	17.460	5.851E-01	AC228
1120.76	34.	37.50	1.90	9.970E-03	1120.28	15.040	PBC<MDA	BI214
1460.91	1140.	3.03	2.60	8.190E-03	1460.75	10.700	1.157E+01	K40
1764.66	27.	25.46	2.29	7.084E-03	1764.51	15.920	2.113E-01	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide
1218.51	609.47	240.	128.	0.064	57.77	2.348	BI-214 s

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-212	149.29	74.81	480.	165.	0.082	59.65	1.178D
PB-212	153.89	77.11	549.	129.	0.065	66.37	1.180A
RA-226	372.01	186.18	481.	102.	0.051	95.90	1.500s
TH-227	470.88	235.62	896.	-112.	-0.056	116.81	1.500s
PB-212	476.89	238.63	363.	485.	0.243	20.70	1.297D
PB-214	483.47	241.92	376.	90.	0.045	95.44	1.299D
PB-214	589.91	295.14	232.	180.	0.090	45.21	1.877s
AC-228	675.54	337.96	248.	220.	0.110	44.57	2.861s
PB-214	703.23	351.81	224.	381.	0.191	27.07	2.477s
TL-208	1021.40	510.90	141.	118.	0.059	43.45	2.150s
TL-208	1166.53	583.47	103.	259.	0.130	28.67	2.439s
BI-214	1218.89	609.65	100.	178.	0.089	31.81	1.558s
Ag-108M	1223.81	612.11	178.	-53.	-0.027	114.50	1.561s
CS-137	1323.81	662.12	67.	133.	0.066	40.64	2.081s
BI-212	1453.31	726.87	80.	64.	0.032	82.59	1.600s
AC-228	1822.24	911.34	55.	174.	0.087	30.74	1.916s
AC-228	1934.82	967.63	75.	127.	0.063	45.93	1.907s
BI-214	2241.08	1120.76	70.	34.	0.017	112.51	1.897s
K-40	2921.41	1460.91	19.	1136.	0.568	9.10	2.597s
BI-214	3528.97	1764.66	12.	27.	0.013	76.39	2.291s

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	Peak MDA Value pCi/gm	COMMENTS
BE-7		6.1726E-02					
			477.56	6.173E-02	&(	2.459E-01 7.28E-02	G
K-40		1.1567E+01					
			1460.75	1.157E+01	*(P	2.357E-01 3.52E-01	G
MN-54		-5.8186E-04					
			834.81	-5.819E-04	&(P	2.831E-02 7.98E-03	G
CO-57		5.8142E-03					
			122.07	5.814E-03	%(P	3.303E-02 9.88E-03	G K
			136.43	-4.987E-02	% P	2.591E-01 7.75E-02	G
CO-60		3.5137E-03					
			1332.51	3.514E-03	&(P	3.317E-02 9.21E-03	G K
			1173.23	8.041E-03	% P	3.603E-02 1.04E-02	G K
Sr-85		-1.6762E-02					
			514.00	-1.676E-02	%(	3.545E-02 1.07E-02	G
Kr-85		-4.1353E+02					
			513.99	-4.135E+02	%(P	8.072E+02 2.43E+02	G
Y-88		-1.0780E-03					
			1836.01	-1.078E-03	&(P	9.768E-03 1.33E-03	G K
			898.02	-9.537E-03	% P	3.532E-02 1.03E-02	G
NB-94		-2.4110E-03					
			871.10	-2.411E-03	%(P	2.787E-02 7.94E-03	G K
			702.50	5.105E-03	% P	2.415E-02 7.03E-03	G K
Ag-108M		-8.2917E-04					
			722.95	-8.292E-04	&(	5.256E-02 1.54E-02	G K
			614.37	-3.350E-02	+	4.101E-02 1.28E-02	G
			433.93	-1.183E-03	% P	2.229E-02 6.32E-03	G
CD-109		2.7963E-01					
			88.04	2.796E-01	%(P	1.042E+00 3.13E-01	G
SN-113		9.4526E-03					
			391.71	9.453E-03	&(P	3.293E-02 9.75E-03	G K
			255.04	-3.733E-01	%	1.165E+00 3.49E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	1.2323E-02						
		427.95	1.232E-02	%(P	7.767E-02	2.27E-02	G K
		600.77	3.649E-02	% P	8.568E-02	2.55E-02	G
		636.15	2.373E-03	& P	1.813E-01	5.07E-02	G
		463.51	1.000E-01	% P	2.395E-01	7.17E-02	G
		176.29	-3.190E-02	% P	3.991E-01	1.18E-01	G
I-131	1.0038E-03						
		364.48	1.004E-03	%(	3.249E-02	9.44E-03	G K
		636.97	-4.515E-02	%	3.640E-01	1.05E-01	G
		284.29	-9.929E-02	%	4.520E-01	1.34E-01	G
CS-134	-1.5873E-02						
		604.66	-1.587E-02	%(P	3.559E-02	1.07E-02	G K
		795.76	1.449E-02	% P	2.776E-02	8.46E-03	G
		569.29	-5.476E-03	&	1.550E-01	4.44E-02	G
		801.84	-5.841E-02	% P	3.027E-01	8.77E-02	G
CS-137	9.4749E-02						
		661.62	9.475E-02	*(P	2.924E-02	1.32E-02	G
CE-139	-1.8869E-03						
		165.85	-1.887E-03	&(P	3.214E-02	9.53E-03	G
EU-152	-6.1482E-03						
		121.78	-6.148E-03	&(P	9.511E-02	2.83E-02	G K
		344.30	-1.923E-02	% P	8.861E-02	2.62E-02	G
		1408.08	4.885E-02	% P	1.129E-01	3.37E-02	G
		964.00	1.332E-02	& P	4.676E-01	1.38E-01	G
		1112.07	-5.277E-02	% P	2.714E-01	7.88E-02	G
		778.90	1.221E-02	% P	1.097E-01	2.98E-02	G
EU-154	4.3000E-04						
		123.10	4.300E-04	%(P	6.664E-02	1.97E-02	G K
		1274.80	-1.831E-02	% P	1.012E-01	2.92E-02	G
		723.30	2.469E-04	& P	1.575E-01	4.51E-02	G
		1004.80	5.313E-02	& P	1.661E-01	4.91E-02	G
EU-155	2.8181E-02						
		86.45	2.818E-02	%(	1.231E-01	3.70E-02	G K
		105.31	1.837E-02	& P	1.385E-01	4.14E-02	G
HG-203	2.2609E-03						
		279.17	2.261E-03	%(P	2.997E-02	8.81E-03	G K
		72.87	-1.872E-01	% P	8.884E-01	2.67E-01	G
		70.83	1.464E-02	%	1.485E+00	4.43E-01	G
		82.50	1.380E-02	%	1.983E+00	5.91E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	1.6531E-01						
		583.14	1.653E-01	*(P	3.179E-02	1.61E-02	G
		510.72	2.594E-01	+ P	1.272E-01	4.83E-02	G
PB-212	3.1504E-01						
		238.63	3.150E-01	(P	5.939E-02	2.24E-02	G K
							Energy duplication
		77.11	2.228E-01	}	1.929E-01	4.93E-02	G
		74.81	5.370E-01	+ P	3.421E-01	1.09E-01	G
PB-214	3.7173E-01						
		351.99	3.783E-01	*(P	7.178E-02	3.46E-02	G K
		295.22	3.028E-01	- P	1.237E-01	4.68E-02	G
							Energy duplication
		77.11	1.997E-01	} P	3.850E-01	1.05E-01	G
		241.92	3.389E-01	(P	3.517E-01	1.10E-01	G
BI-212	3.4958E-01						
		727.17	3.496E-01	*(P	2.450E-01	9.82E-02	G K
		1620.56	1.145E-01	% P	8.558E-01	2.33E-01	G
		785.42	5.832E-01	% P	1.242E+00	3.74E-01	G
BI-214	2.1420E-01						
		609.32	2.185E-01	*(P	6.053E-02	2.37E-02	G K
		1764.51	2.113E-01	@(P	1.481E-01	5.56E-02	G
		1120.28	2.039E-01	(P	2.485E-01	7.85E-02	G
RA-224	-5.5854E-02						
		241.00	-5.585E-02	&(P	9.930E-01	2.96E-01	G
RA-226	7.6878E-01						
		185.99	7.688E-01	(	7.904E-01	2.46E-01	G
AC-228	5.3857E-01						
		911.07	4.623E-01	*(P	9.851E-02	4.85E-02	G K
		968.90	5.851E-01	*(P	1.985E-01	9.11E-02	G
		338.40	6.551E-01	*(P	2.260E-01	9.87E-02	G
TH-227	-2.7889E-01						
		236.00	-2.789E-01	?(P	3.530E-01	1.08E-01	G K
		256.25	-1.131E-01	% P	3.269E-01	9.75E-02	G
PA-234	-1.7509E-02						
		98.44	-1.751E-02	%(	1.210E-01	3.62E-02	G K
		946.00	-7.030E-03	%	1.413E-01	4.00E-02	G
		131.28	-9.185E-03	%	1.412E-01	4.20E-02	G
		94.67	-5.898E-02	%	2.282E-01	6.86E-02	G
		883.24	4.706E-02	%	1.931E-01	5.61E-02	G
		926.70	-5.235E-02	&	3.128E-01	9.12E-02	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26-9.304E-03 &   2.296E-01 6.58E-02 G

TH-234       2.7185E-01
                           63.29 2.719E-01 %(P 1.502E+00 4.48E-01 G K
                           92.80 5.663E-01 % P 1.208E+00 3.64E-01 G
                           92.38 7.757E-01 % P 1.430E+00 4.34E-01 G

AM-241       6.2585E-02
                           59.54 6.259E-02 %(P 1.380E-01 4.18E-02 G
```

(- This peak used in the nuclide activity average.

* - Peak is too wide, but only one peak in library.
! - Peak is part of a multiplet and this area went negative during deconvolution.
? - Peak is too narrow.
@ - Peak is too wide at FW25M, but ok at FWHM.
% - Peak fails sensitivity test.
$ - Peak identified, but first peak of this nuclide failed one or more qualification tests.
\+ - Peak activity higher than counting uncertainty range.
\- - Peak activity lower than counting uncertainty range.
= - Peak outside analysis energy range.
& - Calculated peak centroid is not close enough to the library energy centroid for positive identification.
P - Peakbackground subtraction
} - Peak is too close to another for the activity to be found directly.

Nuclide Codes:	Peak Codes:
T - Thermal Neutron Activation	G - Gamma Ray
F - Fast Neutron Activation	X - X-Ray
I - Fission Product	P - Positron Decay
N - Naturally Occurring Isotope	S - Single-Escape
P - Photon Reaction	D - Double-Escape
C - Charged Particle Reaction	K - Key Line
M - No MDA Calculation	A - Not in Average
R - Coincidence Corrected	C - Coincidence Peak
H - Halflife limit exceeded	

\- -

***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	6.0191E-02	6.1726E-02	2.1839E-01	2.1842E-01	2.398E-01
K-40	#	1.1567E+01	1.1567E+01	1.0571E+00	1.2586E+00	
MN-54	#A	-5.7936E-04	-5.8186E-04	7.8704E-02	7.8704E-02	2.819E-02
CO-57	#B	5.7853E-03	5.8142E-03	2.9633E-02	2.9634E-02	3.287E-02
CO-60	#B	3.5113E-03	3.5137E-03	2.7630E-02	2.7631E-02	3.314E-02

Sr-85	#A	-1.6418E-02	-1.6762E-02	3.2233E-02	3.2248E-02	3.472E-02
Kr-85	#A	-4.1353E+02	-4.1353E+02	8.6160E+02	8.6195E+02	8.072E+02
Y-88	#B	-1.0645E-03	-1.0780E-03	6.4680E-03	6.4683E-03	9.646E-03
NB-94	#B	-2.4110E-03	-2.4110E-03	2.5920E-02	2.5920E-02	2.787E-02
Ag-108M	#B	-8.2915E-04	-8.2917E-04	4.6147E-02	4.6147E-02	5.256E-02
CD-109	#A	2.7880E-01	2.7963E-01	9.4042E-01	9.4055E-01	1.039E+00
SN-113	#B	9.3428E-03	9.4526E-03	2.9238E-02	2.9244E-02	3.254E-02
SB-125	#B	1.2307E-02	1.2323E-02	6.8127E-02	6.8130E-02	7.757E-02
I-131	#B	8.4914E-04	1.0038E-03	2.8307E-02	2.8307E-02	2.748E-02
CS-134	#B	-1.5844E-02	-1.5873E-02	3.3462E-02	3.3475E-02	3.553E-02
CS-137	#	9.4737E-02	9.4749E-02	3.9527E-02	3.9922E-02	
CE-139	#A	-1.8685E-03	-1.8869E-03	3.1883E-02	3.1883E-02	3.182E-02
EU-152	#B	-6.1464E-03	-6.1482E-03	8.7981E-02	8.7982E-02	9.508E-02
EU-154	#B	4.2981E-04	4.3000E-04	5.9242E-02	5.9242E-02	6.661E-02
EU-155	#B	2.8160E-02	2.8181E-02	1.1095E-01	1.1097E-01	1.230E-01
HG-203	#B	2.1965E-03	2.2609E-03	2.6440E-02	2.6441E-02	2.912E-02
TL-208	#	1.6531E-01	1.6531E-01	4.8218E-02	4.9197E-02	
PB-212		3.1504E-01	3.1504E-01	6.7338E-02	6.9862E-02	
PB-214		3.7173E-01	3.7173E-01	1.0196E-01	1.0430E-01	
BI-212	#	3.4958E-01	3.4958E-01	2.9457E-01	2.9529E-01	
BI-214	#	2.1420E-01	2.1420E-01	6.9805E-02	7.0942E-02	6.053E-02
RA-224	#A	-5.5854E-02	-5.5854E-02	1.6056E+00	1.6056E+00	9.930E-01
RA-226	#A	7.6878E-01	7.6878E-01	7.3729E-01	7.3869E-01	7.904E-01
AC-228	#	5.3857E-01	5.3857E-01	1.2972E-01	1.3356E-01	
TH-227	#A	-2.7889E-01	-2.7889E-01	3.2655E-01	3.2697E-01	3.530E-01
PA-234	#B	-1.7509E-02	-1.7509E-02	1.0846E-01	1.0847E-01	1.210E-01
TH-234	#B	2.7185E-01	2.7185E-01	1.3432E+00	1.3433E+00	1.502E+00
AM-241	#A	6.2585E-02	6.2585E-02	1.2533E-01	1.2538E-01	1.380E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (295.2 to 2000.1 keV) 1.3401808E+01 pCi/gm
Total Decayed Activity (295.2 to 2000.1 keV) 1.3401819E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JPK

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 101F_9SEP2006_1225.An1

Sample description
FSS-OOL-05-10-006-F-A

Spectrum Filename: C:\GammaVision\Spectra\101F_9SEP2006_1225.An1

Acquisition information
Start time: 09-Sep-2006 12:25:47
Live time: 2000
Real time: 2002
Dead time: 0.08 %
Detector ID: 1

Detector system
Det 101- DSPE-633

Calibration
Filename: D1_1LSa.Clb
Detector 101 1.0 Liter Marinelli Sand

Energy Calibration
Created: 03-Sep-2004 08:50:48
Zero offset: 0.244 keV
Gain: 0.500 keV/channel
Quadratic: -2.493E-08 keV/channel^2

Efficiency Calibration
Created: 03-Sep-2004 08:52:26
Type: Polynomial
Uncertainty: 0.626 %
Coefficients: -0.321775 -5.816463 0.734234
-0.099357 0.006049 -0.000149

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.23keV)
Stop channel: 4000 (1999.11keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 1.4140E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.4140E+03) =
7.0721E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	09-Sep-2006 08:48:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	101_150K_28APR05.Pbc 01-May-2005 05:24:47
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 9 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.0700

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
62.80	75.	37.24	0.72	1.087E-02				
62.80	75.	37.24	0.72	1.087E-02	63.29	3.900	PBC<MDA	TH234
77.22	135.	23.56	1.50	1.720E-02	77.11	17.500	4.277E-01	PB212
					77.11	10.700	6.802E-01	PB214
77.22	131.	23.56	1.50	1.720E-02	77.11	17.500	PBC<MDA	PB212
					77.11	10.700	6.802E-01	PB214
92.97	74.	25.06	1.02	1.992E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
186.09	92.	24.39	1.50	1.858E-02	185.99	3.280	1.438E+00	RA226
208.82	41.	38.73	1.43	1.724E-02				
238.76	212.	8.65	1.12	1.557E-02	238.63	43.100	2.927E-01	PB212
242.10	70.	19.44	1.12	1.539E-02	241.00	3.900	1.096E+00	RA224
295.32	129.	13.14	1.42	1.292E-02	295.22	19.200	4.905E-01	PB214
338.49	39.	39.77	0.86	1.135E-02	338.40	12.010	PBC<MDA	AC228
351.92	247.	9.26	1.02	1.093E-02				
351.92	247.	9.26	1.02	1.093E-02	351.99	37.100	5.787E-01	PB214
511.02	26.	25.04	1.50	7.590E-03	510.72	22.500	PBC<MDA	TL208
583.00	78.	17.84	0.85	6.686E-03				
583.00	78.	17.84	0.85	6.686E-03	583.14	86.000	1.249E-01	TL208
609.32	170.	8.92	1.50	6.413E-03	609.32	46.090	5.461E-01	BI214
911.10	15.	36.03	1.58	4.447E-03	911.07	29.000	PBC<MDA	AC228
969.38	25.	27.20	0.57	4.210E-03	968.90	17.460	3.103E-01	AC228
1120.90	52.	20.03	1.31	3.711E-03	1120.28	15.040	8.873E-01	BI214
1460.54	178.	7.68	2.00	2.943E-03	1460.75	10.700	5.346E+00	K40
1764.22	31.	17.96	0.67	2.481E-03	1764.51	15.920	7.394E-01	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
125.17	62.80	282.	75.	0.038	111.71	0.722	PA-234	l
185.29	93.06	134.	73.	0.036	76.44	1.018	TH-234	D
417.31	208.82	96.	41.	0.021	116.20	1.429	LU-177	s
477.23	238.69	62.	212.	0.106	25.95	1.122	PB-212	D
483.91	242.03	57.	70.	0.035	58.32	1.124	PB-214	D
1939.18	969.38	8.	25.	0.012	81.59	0.570	AC-228	l

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-212	153.79	77.11	437.	135.	0.067	70.69	1.499D
PB-214	153.79	77.11	440.	131.	0.066	70.69	1.499D
TH-234	185.40	92.91	301.	75.	0.038	90.19	1.499s
TH-234	185.39	92.90	296.	78.	0.039	91.81	1.499s
RA-226	372.19	186.27	166.	72.	0.036	83.79	1.499s
PB-212	477.16	238.73	156.	156.	0.078	39.78	1.499
RA-224	483.56	241.93	158.	59.	0.029	97.51	1.499
PB-214	590.42	295.33	85.	129.	0.065	39.52	1.499s
PB-214	703.87	352.04	75.	192.	0.096	28.54	1.499
TL-208	1021.98	511.02	50.	26.	0.013	75.11	1.499s
TL-208	1166.51	583.25	37.	46.	0.023	67.04	1.499s
BI-214	1218.67	609.32	21.	169.	0.084	26.76	1.505
AC-228	1822.55	911.10	13.	15.	0.008	108.10	1.578s
BI-214	2242.39	1120.90	17.	52.	0.026	60.09	1.308s
K-40	2922.10	1460.54	5.	176.	0.088	23.04	1.995s
BI-214	3529.87	1764.22	0.	31.	0.015	53.88	0.666s

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	Peak MDA Value pCi/gm	COMMENTS
BE-7		0.0000E+00					
			477.56	0.000E+00	%(	3.961E-01 1.11E-01	G
K-40		5.3460E+00					
			1460.75	5.346E+00	@(P	3.947E-01 4.16E-01	G
MN-54		4.7590E-03					
			834.81	4.759E-03	%(P	3.780E-02 1.02E-02	G
CO-57		9.1434E-03					
			122.07	9.143E-03	&(	4.023E-02 1.20E-02	G K
			136.43	0.000E+00	%	3.323E-01 9.73E-02	G
CO-60		-1.9759E-03					
			1332.51	-1.976E-03	%(P	4.647E-02 1.18E-02	G K
			1173.23	1.633E-02	& P	4.246E-02 1.25E-02	G K
Sr-85		-6.7641E-03					
			514.00	-6.764E-03	%(	4.507E-02 1.30E-02	G
Kr-85		-1.6036E+02					
			513.99	-1.604E+02	%(P	1.044E+03 2.95E+02	G
Y-88		0.0000E+00					
			1836.01	0.000E+00	%(	6.673E-02 1.69E-02	G K
			898.02	1.320E-02	% P	4.792E-02 1.38E-02	G
NB-94		3.0875E-03					
			871.10	3.087E-03	%(P	3.768E-02 1.00E-02	G K
			702.50	-5.217E-04	& P	3.466E-02 9.15E-03	G K
Ag-108M		-7.6588E-04					
			722.95	-7.659E-04	%(	4.435E-02 1.19E-02	G K
			614.37	-6.684E-03	& P	4.183E-02 1.18E-02	G
			433.93	7.148E-03	%	2.798E-02 8.06E-03	G
CD-109		-3.0502E-01					
			88.04	-3.050E-01	&(P	1.313E+00 3.92E-01	G
SN-113		9.4792E-04					
			391.71	9.479E-04	&(	5.036E-02 1.41E-02	G K
			255.04	-1.392E-01	% P	1.450E+00 4.19E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	2.2590E-02						
		427.95	2.259E-02	&(P	8.919E-02	2.57E-02	G K
		600.77	-2.741E-02	% P	2.000E-01	5.57E-02	G
		636.15	-3.445E-02	% P	3.422E-01	9.41E-02	G
		463.51	7.479E-02	% P	2.851E-01	8.13E-02	G
		176.29	-1.758E-01	% P	5.452E-01	1.62E-01	G
I-131	7.9195E-03						
		364.48	7.920E-03	&(	4.218E-02	1.22E-02	G K
		636.97	-3.837E-02	%	5.038E-01	1.38E-01	G
		284.29	1.727E-01	&	4.928E-01	1.47E-01	G
CS-134	7.1712E-03						
		604.66	7.171E-03	&(P	2.891E-02	8.13E-03	G K
		795.76	2.656E-03	% P	4.732E-02	1.27E-02	G
		569.29	-2.144E-02	& P	2.305E-01	6.32E-02	G
		801.84	1.106E-01	%	4.904E-01	1.40E-01	G
CS-137	6.3522E-03						
		661.62	6.352E-03	&(P	5.046E-02	1.41E-02	G
CE-139	4.4701E-04						
		165.85	4.470E-04	%(P	4.249E-02	1.24E-02	G
EU-152	2.1338E-02						
		121.78	2.134E-02	&(P	1.238E-01	3.67E-02	G K
		344.30	3.085E-03	% P	1.174E-01	3.30E-02	G
		1408.08	2.510E-02	% P	1.632E-01	4.16E-02	G
		964.00	-6.118E-03	% P	3.785E-01	1.01E-01	G
		1112.07	1.306E-02	& P	4.562E-01	1.24E-01	G
		778.90	-1.407E-03	% P	4.641E-01	1.29E-01	G
EU-154	-7.1874E-03						
		123.10	-7.187E-03	&(P	7.872E-02	2.31E-02	G K
		1274.80	2.795E-03	& P	1.820E-01	4.88E-02	G
		723.30	-3.225E-03	% P	3.150E-01	8.80E-02	G
		1004.80	-8.281E-04	% P	2.762E-01	7.27E-02	G
EU-155	6.9979E-02						
		86.45	6.998E-02	%(	1.408E-01	4.27E-02	G K
		105.31	3.981E-02	%	1.602E-01	4.78E-02	G
HG-203	-3.6015E-03						
		279.17	-3.601E-03	%(	3.973E-02	1.15E-02	G K
		72.87	-2.325E-01	% P	1.092E+00	3.26E-01	G
		70.83	1.783E-03	%	1.646E+00	4.85E-01	G
		82.50	-5.219E-01	&	1.841E+00	5.51E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	9.0767E-02						
		583.14	7.697E-02	@(P	5.175E-02	1.81E-02	G
		510.72	1.435E-01	*(P	1.989E-01	5.84E-02	G
PB-212	2.2220E-01						
		238.63	2.222E-01	(P	8.683E-02	3.06E-02	G K
							Energy duplication
		77.11	4.277E-01	+	3.177E-01	1.01E-01	G
		74.81	3.063E-01	& P	6.559E-01	1.98E-01	G
PB-214	4.6716E-01						
		351.99	4.517E-01	(P	1.014E-01	4.34E-02	G K
		295.22	4.970E-01	*(P	1.758E-01	6.64E-02	G
							Energy duplication
		77.11	6.802E-01	+ P	5.217E-01	1.65E-01	G
		241.92	-4.718E-02	% P	5.204E-01	1.52E-01	G
BI-212	1.8172E-01						
		727.17	1.817E-01	%(P	3.189E-01	9.85E-02	G K
		1620.56	-2.015E-01	%	1.809E+00	4.71E-01	G
		785.42	4.081E-02	& P	1.885E+00	4.96E-01	G
BI-214	5.4611E-01						
		609.32	5.461E-01	(P	7.799E-02	4.90E-02	G K
		1764.51	7.394E-01	+ P	1.783E-01	1.35E-01	G
		1120.28	8.873E-01	+ P	3.772E-01	1.79E-01	G
RA-224	9.3113E-01						
		241.00	9.311E-01	&(P	9.707E-01	3.06E-01	G
RA-226	1.1275E+00						
		185.99	1.127E+00	(	9.831E-01	3.15E-01	G
AC-228	1.1485E-01						
		911.07	1.149E-01	@(P	1.434E-01	4.64E-02	G K
		968.90	1.455E-01	% P	2.989E-01	9.04E-02	G
		338.40	2.069E-01	% P	2.768E-01	8.64E-02	G
TH-227	-8.7585E-02						
		236.00	-8.758E-02	%(P	3.755E-01	1.11E-01	G K
		256.25	8.747E-02	% P	4.647E-01	1.36E-01	G
PA-234	-5.6423E-04						
		98.44	-5.642E-04	%(	1.500E-01	4.40E-02	G K
		946.00	6.125E-02	%	2.021E-01	5.84E-02	G
		131.28	5.641E-03	%	1.406E-01	4.09E-02	G
		94.67	-4.507E-02	%	2.651E-01	7.88E-02	G
		883.24	5.170E-02	%	2.751E-01	7.54E-02	G
		926.70	-3.033E-02	&	4.861E-01	1.33E-01	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26-2.954E-02 &   3.517E-01 9.77E-02 G

TH-234       1.1945E+00
                           63.29 1.013E+00 %(P 1.948E+00 5.89E-01 G K
                           92.80 1.249E+00 *(P 1.327E+00 4.13E-01 G
                           92.38 1.406E+00 *(P 1.566E+00 4.84E-01 G

AM-241       1.0670E-02
                           59.54 1.067E-02 %(P 2.897E-01 8.55E-02 G
   ( - This peak used in the nuclide activity average.

   * - Peak is too wide, but only one peak in library.
   ! - Peak is part of a multiplet and this area went
       negative during deconvolution.
   ? - Peak is too narrow.
   @ - Peak is too wide at FW25M, but ok at FWHM.
   % - Peak fails sensitivity test.
   $ - Peak identified, but first peak of this nuclide
       failed one or more qualification tests.
   + - Peak activity higher than counting uncertainty range.
   - - Peak activity lower than counting uncertainty range.
   = - Peak outside analysis energy range.
   & - Calculated peak centroid is not close enough to the
       library energy centroid for positive identification.
   P - Peakbackground subtraction
   } - Peak is too close to another for the activity
       to be found directly.

   Nuclide Codes:                      Peak Codes:
   T - Thermal Neutron Activation      G - Gamma Ray
   F - Fast Neutron Activation         X - X-Ray
   I - Fission Product                 P - Positron Decay
   N - Naturally Occurring Isotope     S - Single-Escape
   P - Photon Reaction                 D - Double-Escape
   C - Charged Particle Reaction       K - Key Line
   M - No MDA Calculation              A - Not in Average
   R - Coincidence Corrected           C - Coincidence Peak
   H - Halflife limit exceeded

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
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***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	0.0000E+00	0.0000E+00	3.3230E-01	3.3230E-01	3.953E-01
K-40	#	5.3460E+00	5.3460E+00	1.2478E+00	1.2838E+00	
MN-54	#A	4.7574E-03	4.7590E-03	3.0670E-02	3.0671E-02	3.778E-02
CO-57	#B	9.1398E-03	9.1434E-03	3.5936E-02	3.5940E-02	4.022E-02
CO-60	#B	-1.9758E-03	-1.9759E-03	4.6080E-02	4.6080E-02	4.647E-02

Sr-85	#A	-6.7532E-03	-6.7641E-03	3.8894E-02	3.8896E-02	4.500E-02
Kr-85	#A	-1.6036E+02	-1.6036E+02	1.3749E+03	1.3749E+03	1.044E+03
Y-88	#B	0.0000E+00	0.0000E+00	5.0824E-02	5.0824E-02	6.667E-02
NB-94	#B	3.0875E-03	3.0875E-03	3.0090E-02	3.0091E-02	3.768E-02
Ag-108M	#B	-7.6588E-04	-7.6588E-04	3.5800E-02	3.5800E-02	4.435E-02
CD-109	#A	-3.0495E-01	-3.0502E-01	1.2254E+00	1.2256E+00	1.312E+00
SN-113	#B	9.4705E-04	9.4792E-04	4.2262E-02	4.2262E-02	5.031E-02
SB-125	#B	2.2588E-02	2.2590E-02	7.6987E-02	7.6998E-02	8.918E-02
I-131	#B	7.8169E-03	7.9195E-03	3.6730E-02	3.6733E-02	4.163E-02
CS-134	#B	7.1702E-03	7.1712E-03	2.4395E-02	2.4398E-02	2.891E-02
CS-137	#A	6.3522E-03	6.3522E-03	4.2209E-02	4.2211E-02	5.046E-02
CE-139	#A	4.4667E-04	4.4701E-04	3.7210E-02	3.7210E-02	4.246E-02
EU-152	#B	2.1338E-02	2.1338E-02	1.1015E-01	1.1016E-01	1.238E-01
EU-154	#B	-7.1871E-03	-7.1874E-03	9.2091E-02	9.2092E-02	7.871E-02
EU-155	#B	6.9975E-02	6.9979E-02	1.2820E-01	1.2826E-01	1.408E-01
HG-203	#B	-3.5934E-03	-3.6015E-03	3.4446E-02	3.4447E-02	3.964E-02
TL-208	#	9.0767E-02	9.0767E-02	6.3965E-02	6.4170E-02	5.175E-02
PB-212	#	2.2220E-01	2.2220E-01	9.1879E-02	9.2733E-02	8.683E-02
PB-214	#	4.6716E-01	4.6716E-01	1.1530E-01	1.1828E-01	1.014E-01
BI-212	#B	1.8172E-01	1.8172E-01	2.9552E-01	2.9570E-01	3.189E-01
BI-214		5.4611E-01	5.4611E-01	1.4712E-01	1.5032E-01	
RA-224	#A	9.3113E-01	9.3113E-01	9.1904E-01	9.2054E-01	9.707E-01
RA-226	#	1.1275E+00	1.1275E+00	9.4472E-01	9.4686E-01	9.831E-01
AC-228	#A	1.1485E-01	1.1485E-01	1.3911E-01	1.3926E-01	1.434E-01
TH-227	#B	-8.7585E-02	-8.7585E-02	3.5297E-01	3.5300E-01	3.755E-01
PA-234	#B	-5.6423E-04	-5.6423E-04	1.3199E-01	1.3199E-01	1.500E-01
TH-234	#B	1.1945E+00	1.1945E+00	8.9789E-01	9.0033E-01	1.948E+00
AM-241	#A	1.0670E-02	1.0670E-02	2.5658E-01	2.5658E-01	2.897E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (295.1 to 1999.1 keV) 5.8921618E+00 pCi/gm
Total Decayed Activity (295.1 to 1999.1 keV) 5.8921618E+00 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JJM

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 101F_11SEPT2006_1149.An1

Sample description
FSS-OOL-05-10-017-F-A

Spectrum Filename: C:\GammaVision\Spectra\101F_11SEPT2006_1149.An1

Acquisition information
Start time: 11-Sep-2006 11:51:01
Live time: 2000
Real time: 2002
Dead time: 0.08 %
Detector ID: 1

Detector system
Det 101- DSPE-633

Calibration
Filename: D1_1LSa.Clb
Detector 101 1.0 Liter Marinelli Sand

Energy Calibration
Created: 03-Sep-2004 08:50:48
Zero offset: 0.244 keV
Gain: 0.500 keV/channel
Quadratic: -2.493E-08 keV/channel^2

Efficiency Calibration
Created: 03-Sep-2004 08:52:26
Type: Polynomial
Uncertainty: 0.626 %
Coefficients: -0.321775 -5.816463 0.734234
-0.099357 0.006049 -0.000149

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.23keV)
Stop channel: 4000 (1999.11keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 1.4060E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.4060E+03) =
7.1124E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	09-Sep-2006 13:43:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	101_150K_28APR05.Pbc 01-May-2005 05:24:47
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 9 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.0717

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
74.66	69.	28.82	1.00	1.649E-02				
74.66	69.	28.82	1.00	1.649E-02	74.81	9.600	PBC<MDA	PB212
77.16	158.	13.26	1.01	1.721E-02	77.11	10.700	8.079E-01	PB214
					77.11	17.500	5.059E-01	PB212
93.13	66.	38.92	1.47	1.993E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
186.15	98.	19.39	1.27	1.857E-02	185.99	3.280	1.541E+00	RA226
238.83	235.	7.62	1.12	1.556E-02	238.63	43.100	3.271E-01	PB212
241.85	71.	19.05	1.12	1.540E-02				
295.14	148.	11.70	1.22	1.292E-02				
295.14	148.	11.70	1.22	1.292E-02	295.22	19.200	5.661E-01	PB214
338.48	42.	29.65	1.01	1.135E-02	338.40	12.010	2.843E-01	AC228
352.05	228.	8.64	1.23	1.092E-02	351.99	37.100	5.369E-01	PB214
510.85	13.	32.38	1.50	7.590E-03	510.72	22.500	PBC<MDA	TL208
583.17	42.	27.70	1.00	6.684E-03	583.14	86.000	6.558E-02	TL208
609.39	178.	9.58	1.33	6.412E-03	609.32	46.090	5.769E-01	BI214
910.97	35.	24.53	1.00	4.447E-03				
910.97	35.	24.53	1.00	4.447E-03	911.07	29.000	2.440E-01	AC228
969.66	51.	21.99	1.39	4.209E-03	968.90	17.460	6.571E-01	AC228
1120.05	51.	16.96	2.00	3.711E-03	1120.28	15.040	8.855E-01	BI214
1460.81	143.	8.36	2.13	2.942E-03	1460.75	10.700	4.296E+00	K40
1764.48	24.	20.41	0.80	2.481E-03	1764.51	15.920	5.733E-01	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide

148.88	74.65	166.	69.	0.035	86.47	1.005	BI-207	D
153.88	77.15	142.	158.	0.079	39.78	1.007	PB-214	D

Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM	Suspected	
477.36	238.92	43.	235.	0.117	22.87	1.122	PB-212	D
483.40	241.94	56.	71.	0.035	57.16	1.124	PB-214	D
1939.73	969.66	32.	36.	0.018	82.93	1.390	AC-228	s

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-214	153.79	77.11	368.	102.	0.051	82.28	1.499D
PB-212	153.79	77.11	364.	105.	0.053	82.28	1.499D
TH-234	185.11	92.76	326.	84.	0.042	84.88	1.499s
TH-234	185.13	92.78	315.	77.	0.039	95.07	1.499s
RA-226	371.80	186.07	180.	98.	0.049	65.42	1.499
PB-212	477.40	238.85	150.	185.	0.092	34.41	1.499
RA-224	483.47	241.88	142.	63.	0.032	87.46	1.499
PB-214	590.49	295.37	45.	129.	0.065	33.73	1.499
AC-228	676.34	338.28	46.	38.	0.019	84.22	1.499s
PB-214	703.70	351.95	49.	186.	0.093	26.79	1.499
TL-208	1166.41	583.20	30.	22.	0.011	112.14	1.499
BI-214	1218.81	609.39	34.	177.	0.089	28.73	1.333
AC-228	1822.51	911.08	16.	26.	0.013	81.67	1.578s
BI-214	2240.69	1120.05	7.	51.	0.026	50.89	1.999
K-40	2922.64	1460.81	2.	141.	0.070	25.09	2.132
BI-214	3530.42	1764.49	0.	16.	0.008	70.43	2.106s

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	Peak MDA Value pCi/gm	COMMENTS
BE-7		1.1026E-01					
			477.56	1.103E-01	%(	2.996E-01	8.89E-02 G
K-40		4.2958E+00					
			1460.75	4.296E+00	(P	2.975E-01	3.65E-01 G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
MN-54	1.6052E-03						
		834.81	1.605E-03	&(P	3.871E-02	1.02E-02	G
CO-57	6.6338E-03						
		122.07	6.634E-03	&(	3.841E-02	1.14E-02	G K
		136.43	4.225E-02	%	3.136E-01	9.26E-02	G
CO-60	5.6618E-04						
		1332.51	5.662E-04	%(P	5.710E-02	1.49E-02	G K
		1173.23	1.672E-02	% P	5.141E-02	1.49E-02	G K
Sr-85	-1.0611E-02						
		514.00	-1.061E-02	&(	4.920E-02	1.43E-02	G
Kr-85	-2.7498E+02						
		513.99	-2.750E+02	&(P	1.124E+03	3.25E+02	G
Y-88	-1.0115E-03						
		1836.01	-1.011E-03	%(	6.017E-02	1.50E-02	G K
		898.02	-4.087E-04	& P	3.832E-02	9.64E-03	G
NB-94	-4.7934E-03						
		871.10	-4.793E-03	&(P	4.599E-02	1.26E-02	G K
		702.50	1.439E-02	% P	4.251E-02	1.25E-02	G K
Ag-108M	-5.1300E-03						
		722.95	-5.130E-03	%(	4.634E-02	1.29E-02	G K
		614.37	-1.542E-03	% P	4.215E-02	1.15E-02	G
		433.93	2.239E-04	%	4.051E-02	1.13E-02	G
CD-109	-7.2574E-02						
		88.04	-7.257E-02	%(P	1.302E+00	3.85E-01	G
SN-113	-1.0895E-02						
		391.71	-1.090E-02	%(	5.728E-02	1.66E-02	G K
		255.04	-1.507E-01	% P	1.724E+00	5.01E-01	G
SB-125	2.5297E-02						
		427.95	2.530E-02	%(P	1.217E-01	3.52E-02	G K
		600.77	-1.780E-02	% P	2.079E-01	5.73E-02	G
		636.15	-3.337E-02	% P	3.764E-01	1.04E-01	G
		463.51	1.725E-01	% P	2.960E-01	9.08E-02	G
		176.29	-1.197E-01	% P	5.570E-01	1.64E-01	G
I-131	5.9638E-03						
		364.48	5.964E-03	&(	4.359E-02	1.25E-02	G K
		636.97	1.071E-01	&	5.793E-01	1.63E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
		284.29	1.371E-01	%	5.453E-01	1.60E-01	G
CS-134	-5.0985E-04						
		604.66	-5.099E-04	%(P	4.228E-02	1.15E-02	G K
		795.76	-8.474E-04	& P	5.345E-02	1.42E-02	G
		569.29	-4.953E-03	& P	2.252E-01	6.03E-02	G
		801.84	-3.801E-02	%	4.915E-01	1.34E-01	G
CS-137	-9.8115E-03						
		661.62	-9.811E-03	%(P	4.949E-02	1.38E-02	G
CE-139	-5.6996E-03						
		165.85	-5.700E-03	%(P	4.062E-02	1.20E-02	G
EU-152	2.3040E-02						
		121.78	2.304E-02	&(P	1.127E-01	3.34E-02	G K
		344.30	-4.895E-04	% P	1.051E-01	2.91E-02	G
		1408.08	-2.623E-02	& P	2.724E-01	7.23E-02	G
		964.00	-7.192E-03	& P	4.994E-01	1.38E-01	G
		1112.07	-7.471E-02	% P	4.339E-01	1.22E-01	G
		778.90	1.902E-02	& P	2.762E-01	7.37E-02	G
EU-154	1.7051E-04						
		123.10	1.705E-04	&(P	8.822E-02	2.58E-02	G K
		1274.80	-3.166E-02	% P	1.648E-01	4.61E-02	G
		723.30	-2.661E-02	% P	2.254E-01	6.23E-02	G
		1004.80	-3.340E-02	% P	2.716E-01	7.43E-02	G
EU-155	6.7876E-02						
		86.45	6.788E-02	%(	1.333E-01	4.05E-02	G K
		105.31	-1.556E-02	&	1.726E-01	5.10E-02	G
HG-203	-3.7119E-04						
		279.17	-3.712E-04	&(	3.937E-02	1.12E-02	G K
		72.87	-2.240E-01	& P	8.687E-01	2.58E-01	G
		70.83	-4.791E-01	&	1.815E+00	5.44E-01	G
		82.50	-6.395E-01	%	2.158E+00	6.47E-01	G
TL-208	3.6080E-02						
		583.14	3.608E-02	(P	4.755E-02	1.50E-02	G
		510.72	7.388E-02	% P	1.932E-01	5.31E-02	G
PB-212	2.8525E-01						
		238.63	2.645E-01	(P	8.572E-02	3.14E-02	G K
							Energy duplication
		77.11	3.362E-01	(	2.927E-01	9.22E-02	G
		74.81	3.713E-01	& P	5.968E-01	1.82E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
PB-214	4.7247E-01						
		351.99	4.415E-01	(P	8.380E-02	3.98E-02	G K
		295.22	5.001E-01	(P	1.310E-01	5.70E-02	G
							Energy duplication
		77.11	5.305E-01	(P	4.810E-01	1.51E-01	G
		241.92	3.564E-03	% P	5.699E-01	1.66E-01	G
BI-212	1.9265E-01						
		727.17	1.927E-01	%(P	3.292E-01	1.02E-01	G K
		1620.56	4.088E-01	&	1.358E+00	3.82E-01	G
		785.42	5.087E-01	% P	1.511E+00	4.37E-01	G
BI-214	5.7686E-01						
		609.32	5.769E-01	(P	9.666E-02	5.56E-02	G K
		1764.51	3.970E-01	- P	1.793E-01	9.57E-02	G
		1120.28	8.855E-01	+ P	2.526E-01	1.51E-01	G
RA-224	1.0084E+00						
		241.00	1.008E+00	&(P	9.303E-01	2.97E-01	G
RA-226	1.5485E+00						
		185.99	1.548E+00	(	1.029E+00	3.38E-01	G
AC-228	2.1430E-01						
		911.07	1.917E-01	(P	1.603E-01	5.60E-02	G K
		968.90	1.847E-01	% P	2.962E-01	9.25E-02	G
		338.40	2.689E-01	*(P	2.422E-01	7.98E-02	G
TH-227	-2.6673E-02						
		236.00	-2.667E-02	&(P	2.623E-01	7.58E-02	G K
		256.25	1.512E-01	& P	4.630E-01	1.38E-01	G
PA-234	-1.0638E-02						
		98.44	-1.064E-02	%(	1.326E-01	3.90E-02	G K
		946.00	2.175E-02	%	2.238E-01	6.08E-02	G
		131.28	4.458E-02	&	1.667E-01	4.97E-02	G
		94.67	-6.735E-02	%	2.580E-01	7.71E-02	G
		883.24	2.485E-02	%	2.828E-01	7.44E-02	G
		926.70	1.332E-01	%	3.736E-01	1.10E-01	G
		569.26	7.557E-03	&	3.482E-01	9.51E-02	G
TH-234	1.1012E+00						
		63.29	6.693E-01	%(P	1.831E+00	5.48E-01	G K
		92.80	1.246E+00	(P	1.375E+00	4.26E-01	G
		92.38	1.588E+00	(P	1.636E+00	5.07E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
AM-241	-3.7272E-02						
		59.54	-3.727E-02	%(P	2.577E-01	7.62E-02	G

(- This peak used in the nuclide activity average.

* - Peak is too wide, but only one peak in library.
! - Peak is part of a multiplet and this area went negative during deconvolution.
? - Peak is too narrow.
@ - Peak is too wide at FW25M, but ok at FWHM.
% - Peak fails sensitivity test.
$ - Peak identified, but first peak of this nuclide failed one or more qualification tests.
+ - Peak activity higher than counting uncertainty range.
- - Peak activity lower than counting uncertainty range.
= - Peak outside analysis energy range.
& - Calculated peak centroid is not close enough to the library energy centroid for positive identification.
P - Peakbackground subtraction
} - Peak is too close to another for the activity to be found directly.

Nuclide Codes:	Peak Codes:
T - Thermal Neutron Activation	G - Gamma Ray
F - Fast Neutron Activation	X - X-Ray
I - Fission Product	P - Positron Decay
N - Naturally Occurring Isotope	S - Single-Escape
P - Photon Reaction	D - Double-Escape
C - Charged Particle Reaction	K - Key Line
M - No MDA Calculation	A - Not in Average
R - Coincidence Corrected	C - Coincidence Peak
H - Halflife limit exceeded	

- -

***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	1.0754E-01	1.1026E-01	2.6660E-01	2.6668E-01	2.922E-01
K-40		4.2958E+00	4.2958E+00	1.0952E+00	1.1217E+00	
MN-54	#A	1.5984E-03	1.6052E-03	3.0517E-02	3.0517E-02	3.855E-02
CO-57	#B	6.6012E-03	6.6338E-03	3.4120E-02	3.4122E-02	3.822E-02
CO-60	#B	5.6579E-04	5.6618E-04	4.4643E-02	4.4643E-02	5.706E-02
Sr-85	#A	-1.0395E-02	-1.0611E-02	4.3044E-02	4.3048E-02	4.820E-02
Kr-85	#A	-2.7498E+02	-2.7498E+02	1.2562E+03	1.2563E+03	1.124E+03
Y-88	#B	-9.9892E-04	-1.0115E-03	4.5095E-02	4.5095E-02	5.943E-02
NB-94	#B	-4.7934E-03	-4.7934E-03	4.2370E-02	4.2371E-02	4.599E-02
Ag-108M	#B	-5.1299E-03	-5.1300E-03	3.8579E-02	3.8580E-02	4.634E-02
CD-109	#A	-7.2361E-02	-7.2574E-02	1.3705E+00	1.3705E+00	1.298E+00

SN-113	#B	-1.0770E-02	-1.0895E-02	4.9889E-02	4.9893E-02	5.662E-02
SB-125	#B	2.5263E-02	2.5297E-02	1.0567E-01	1.0568E-01	1.215E-01
I-131	#B	5.0530E-03	5.9638E-03	3.7389E-02	3.7391E-02	3.694E-02
CS-134	#B	-5.0895E-04	-5.0985E-04	1.1524E-01	1.1524E-01	4.220E-02
CS-137	#A	-9.8103E-03	-9.8115E-03	5.8556E-02	5.8559E-02	4.948E-02
CE-139	#A	-5.6446E-03	-5.6996E-03	3.8484E-02	3.8485E-02	4.022E-02
EU-152	#B	2.3033E-02	2.3040E-02	1.0029E-01	1.0029E-01	1.126E-01
EU-154	#B	1.7044E-04	1.7051E-04	7.7486E-02	7.7486E-02	8.818E-02
EU-155	#B	6.7826E-02	6.7876E-02	1.2149E-01	1.2155E-01	1.332E-01
HG-203	#B	-3.6072E-04	-3.7119E-04	3.3690E-02	3.3690E-02	3.826E-02
TL-208	#A	3.6080E-02	3.6080E-02	4.4915E-02	4.4961E-02	4.755E-02
PB-212	#	2.8525E-01	2.8525E-01	1.0142E-01	1.0269E-01	8.572E-02
PB-214	#	4.7247E-01	4.7247E-01	1.2791E-01	1.3067E-01	8.380E-02
BI-212	#B	1.9265E-01	1.9265E-01	3.0602E-01	3.0621E-01	3.292E-01
BI-214		5.7686E-01	5.7686E-01	1.6678E-01	1.6993E-01	
RA-224	#	1.0084E+00	1.0084E+00	8.9183E-01	8.9365E-01	9.303E-01
RA-226	#	1.5485E+00	1.5485E+00	1.0131E+00	1.0168E+00	1.029E+00
AC-228	#	2.1430E-01	2.1430E-01	1.3385E-01	1.3439E-01	1.603E-01
TH-227	#B	-2.6673E-02	-2.6673E-02	2.7209E-01	2.7209E-01	2.623E-01
PA-234	#B	-1.0638E-02	-1.0638E-02	1.1688E-01	1.1688E-01	1.326E-01
TH-234	#B	1.1012E+00	1.1012E+00	1.0380E+00	1.0398E+00	1.831E+00
AM-241	#A	-3.7271E-02	-3.7272E-02	2.6519E-01	2.6520E-01	2.577E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (295.1 to 1999.1 keV) 4.8726625E+00 pCi/gm
Total Decayed Activity (295.1 to 1999.1 keV) 4.8726625E+00 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JPK

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 101F_12SEP2006_1435.An1

Sample description
FSS-OOL-05-10-011-F

Spectrum Filename: C:\GammaVision\Spectra\101F_12SEP2006_1435.An1

Acquisition information
Start time: 12-Sep-2006 14:35:07
Live time: 2000
Real time: 2001
Dead time: 0.07 %
Detector ID: 1

Detector system
Det 101- DSPE-633

Calibration
Filename: D1_1LSa.Clb
Detector 101 1.0 Liter Marinelli Sand

Energy Calibration
Created: 03-Sep-2004 08:50:48
Zero offset: 0.244 keV
Gain: 0.500 keV/channel
Quadratic: -2.493E-08 keV/channel^2

Efficiency Calibration
Created: 03-Sep-2004 08:52:26
Type: Polynomial
Uncertainty: 0.626 %
Coefficients: -0.321775 -5.816463 0.734234
-0.099357 0.006049 -0.000149

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.23keV)
Stop channel: 4000 (1999.11keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 1.9280E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.9280E+03) =
5.1867E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	09-Sep-2006 10:50:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	101_150K_28APR05.Pbc 01-May-2005 05:24:47
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 11 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.2264

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
74.81	132.	30.90	1.50	1.654E-02	74.81	9.600	PBC<MDA	PB212
77.12	192.	20.70	1.50	1.720E-02	77.11	10.700	7.302E-01	PB214
					77.11	17.500	PBC<MDA	PB212
77.12	196.	20.70	1.50	1.720E-02	77.11	10.700	7.302E-01	PB214
					77.11	17.500	4.552E-01	PB212
93.01	99.	35.20	1.50	1.989E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
93.03	95.	35.72	1.50	1.985E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
186.46	76.	28.53	1.30	1.856E-02	185.99	3.280	8.740E-01	RA226
209.51	58.	34.83	0.79	1.720E-02				
238.88	553.	5.02	1.12	1.557E-02	238.63	43.100	5.705E-01	PB212
242.25	109.	17.57	1.12	1.539E-02	241.00	3.900	1.263E+00	RA224
					241.92	7.470	PBC<MDA	PB214
295.51	149.	12.26	1.10	1.291E-02	295.22	19.200	4.160E-01	PB214
338.89	123.	18.29	1.24	1.133E-02	338.40	12.010	6.217E-01	AC228
352.13	255.	8.01	1.01	1.092E-02	351.99	37.100	4.372E-01	PB214
511.09	81.	21.91	1.51	7.585E-03	510.72	22.500	2.667E-01	TL208
583.13	188.	9.36	1.62	6.685E-03	583.14	86.000	2.261E-01	TL208
609.61	146.	11.03	1.12	6.410E-03	609.32	46.090	3.448E-01	BI214
728.34	37.	26.16	0.99	5.435E-03	727.17	11.800	3.920E-01	BI212
795.49	21.	37.05	1.50	5.016E-03	795.76	85.400	PBC<MDA	CS134
911.71	109.	12.57	1.71	4.444E-03	911.07	29.000	5.812E-01	AC228
968.61	88.	15.87	1.75	4.213E-03				
968.61	88.	15.87	1.75	4.213E-03	968.90	17.460	8.299E-01	AC228
1120.60	35.	37.04	1.92	3.711E-03	1120.28	15.040	4.423E-01	BI214
1461.18	374.	5.28	1.81	2.942E-03	1460.75	10.700	8.280E+00	K40

1765.10	33.	17.41	1.10	2.481E-03	1764.51	15.920	5.778E-01	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide
418.69	209.51	175.	58.	0.029	104.48	0.795	AC-228

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-212	149.18	74.81	833.	132.	0.066	92.70	1.499
PB-214	153.79	77.11	725.	192.	0.096	62.09	1.499D
PB-212	153.79	77.11	721.	196.	0.098	62.09	1.499D
TH-234	185.64	93.03	668.	95.	0.047	107.15	1.499s
TH-234	185.60	93.01	644.	99.	0.050	105.60	1.499s
RA-226	371.97	186.16	309.	86.	0.043	92.49	1.499
PB-212	477.39	238.84	293.	469.	0.234	20.46	1.499
RA-224	483.62	241.96	335.	106.	0.053	78.50	1.499
PB-214	590.72	295.49	135.	152.	0.076	39.90	1.499
AC-228	676.88	338.55	114.	94.	0.047	55.96	1.499s
PB-214	704.09	352.15	73.	223.	0.112	25.50	1.499
TL-208	1022.12	511.09	94.	65.	0.032	65.73	1.507s
TL-208	1166.28	583.13	46.	185.	0.093	28.07	1.621s
BI-214	1219.27	609.61	44.	145.	0.073	33.10	1.118
BI-212	1456.83	728.34	21.	36.	0.018	78.48	0.987s
CS-134	1591.20	795.49	22.	21.	0.011	111.15	1.502s
AC-228	1823.47	911.56	25.	95.	0.047	37.21	1.578s
AC-228	1939.01	969.30	35.	65.	0.032	53.00	1.616
BI-214	2241.79	1120.60	37.	35.	0.018	111.13	1.924
K-40	2923.38	1461.18	7.	372.	0.186	15.84	1.807
BI-214	3531.64	1765.10	0.	33.	0.016	52.22	1.099s

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	Peak MDA Value pCi/gm	COMMENTS
BE-7		1.6628E-01					
			477.56	1.663E-01	&(	2.476E-01 7.79E-02	G
K-40		8.2797E+00					
			1460.75	8.280E+00	(P	3.364E-01 4.40E-01	G
MN-54		-6.1380E-04					
			834.81	-6.138E-04	%(P	4.078E-02 1.11E-02	G
CO-57		-2.8814E-03					
			122.07	-2.881E-03	%(	3.256E-02 9.62E-03	G K
			136.43	-7.798E-02	%	3.456E-01 1.03E-01	G
CO-60		6.4990E-03					
			1332.51	6.499E-03	%(P	4.987E-02 1.38E-02	G K
			1173.23	-2.957E-04	% P	5.086E-02 1.38E-02	G K
Sr-85		-1.7228E-02					
			514.00	-1.723E-02	&(	5.031E-02 1.50E-02	G
Kr-85		-4.0996E+02					
			513.99	-4.100E+02	&(P	1.128E+03 3.36E+02	G
Y-88		4.4995E-03					
			1836.01	4.499E-03	%(	3.747E-02 9.63E-03	G K
			898.02	-5.421E-03	& P	4.771E-02 1.34E-02	G
NB-94		-1.9559E-03					
			871.10	-1.956E-03	&(P	4.629E-02 1.29E-02	G K
			702.50	-1.384E-03	% P	4.868E-02 1.38E-02	G K
Ag-108M		8.5682E-04					
			722.95	8.568E-04	%(	3.479E-02 9.46E-03	G K
			614.37	-1.087E-02	% P	4.714E-02 1.38E-02	G
			433.93	6.131E-04	%	3.502E-02 9.94E-03	G
CD-109		8.2790E-01					
			88.04	8.279E-01	&(P	1.139E+00 3.49E-01	G
SN-113		2.8108E-04					
			391.71	2.811E-04	%(	4.740E-02 1.35E-02	G K
			255.04	-4.427E-01	% P	1.774E+00 5.29E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	1.8938E-02						
		427.95	1.894E-02	&(P	1.074E-01	3.12E-02	G K
		600.77	3.564E-02	% P	1.967E-01	5.67E-02	G
		636.15	6.298E-02	% P	2.327E-01	6.70E-02	G
		463.51	1.512E-01	% P	3.227E-01	9.72E-02	G
		176.29	-1.399E-01	& P	5.423E-01	1.62E-01	G
I-131	7.6995E-04						
		364.48	7.699E-04	%(	4.875E-02	1.39E-02	G K
		636.97	-4.420E-02	%	6.473E-01	1.82E-01	G
		284.29	-7.599E-03	%	7.372E-01	2.15E-01	G
CS-134	1.4435E-02						
		604.66	-3.803E-03	%(P	4.481E-02	1.28E-02	G K
		795.76	3.528E-02	(P	4.066E-02	1.33E-02	G
		569.29	-3.677E-03	% P	2.217E-01	6.15E-02	G
		801.84	0.000E+00	%	4.440E-01	1.21E-01	G
CS-137	-9.3273E-03						
		661.62	-9.327E-03	%(P	4.903E-02	1.40E-02	G
CE-139	1.3002E-02						
		165.85	1.300E-02	&(P	4.371E-02	1.31E-02	G
EU-152	-1.2414E-02						
		121.78	-1.241E-02	%(P	1.338E-01	3.98E-02	G K
		344.30	-1.440E-02	& P	1.303E-01	3.79E-02	G
		1408.08	5.601E-02	% P	1.737E-01	5.00E-02	G
		964.00	1.152E-01	% P	3.253E-01	9.61E-02	G
		1112.07	-3.502E-02	% P	3.715E-01	1.03E-01	G
		778.90	-7.008E-02	% P	3.372E-01	9.73E-02	G
EU-154	1.2260E-02						
		123.10	1.226E-02	&(P	8.662E-02	2.58E-02	G K
		1274.80	2.661E-02	% P	1.215E-01	3.44E-02	G
		723.30	-6.838E-02	% P	2.324E-01	6.82E-02	G
		1004.80	7.449E-02	& P	1.976E-01	5.85E-02	G
EU-155	2.8296E-02						
		86.45	2.830E-02	&(	1.256E-01	3.76E-02	G K
		105.31	4.942E-03	%	1.703E-01	5.05E-02	G
HG-203	5.6880E-03						
		279.17	5.688E-03	%(	4.461E-02	1.31E-02	G K
		72.87	-3.172E-01	% P	1.026E+00	3.08E-01	G
		70.83	6.861E-02	%	1.744E+00	5.19E-01	G
		82.50	-4.825E-01	%	2.148E+00	6.44E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	2.3449E-01						
		583.14	2.261E-01	@(P	4.166E-02	2.14E-02	G
		510.72	2.667E-01	*(P	1.966E-01	7.29E-02	G
PB-212	4.7943E-01						
		238.63	4.893E-01	(P	8.610E-02	3.38E-02	G K
							Energy duplication
		77.11	4.552E-01	(	2.976E-01	9.42E-02	G
		74.81	5.817E-01	& P	6.057E-01	1.87E-01	G
PB-214	4.0152E-01						
		351.99	3.864E-01	(P	7.349E-02	3.31E-02	G K
		295.22	4.307E-01	(P	1.607E-01	5.80E-02	G
							Energy duplication
		77.11	7.302E-01	+ P	4.879E-01	1.54E-01	G
		241.92	6.622E-02	% P	6.957E-01	2.07E-01	G
BI-212	3.9202E-01						
		727.17	3.920E-01	*(P	2.631E-01	1.05E-01	G K
		1620.56	-2.307E-01	%	1.744E+00	4.75E-01	G
		785.42	5.808E-01	% P	2.388E+00	6.96E-01	G
BI-214	3.6878E-01						
		609.32	3.448E-01	(P	7.940E-02	3.83E-02	G K
		1764.51	5.778E-01	+ P	1.308E-01	1.02E-01	G
		1120.28	4.423E-01	(P	3.890E-01	1.66E-01	G
RA-224	1.2292E+00						
		241.00	1.229E+00	&(P	1.024E+00	3.24E-01	G
RA-226	9.9003E-01						
		185.99	9.900E-01	(	9.735E-01	3.05E-01	G
AC-228	5.3892E-01						
		911.07	5.152E-01	@(P	1.424E-01	6.52E-02	G K
		968.90	6.178E-01	(P	2.885E-01	1.10E-01	G
		338.40	4.815E-01	*(P	2.698E-01	9.19E-02	G
TH-227	-1.3833E-01						
		236.00	-1.383E-01	%(P	3.704E-01	1.12E-01	G K
		256.25	-1.582E-02	& P	5.098E-01	1.49E-01	G
PA-234	-1.2359E-02						
		98.44	-1.236E-02	&(	1.509E-01	4.49E-02	G K
		946.00	0.000E+00	%	2.880E-01	8.07E-02	G
		131.28	0.000E+00	&	1.803E-01	5.33E-02	G
		94.67	-1.068E-01	%	2.912E-01	8.79E-02	G
		883.24	5.658E-02	&	3.205E-01	9.08E-02	G
		926.70	-3.896E-02	%	4.221E-01	1.19E-01	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26-9.441E-04 %   3.262E-01 9.09E-02 G

TH-234       9.6178E-01
                           63.29 5.805E-01 %(P 1.818E+00 5.45E-01 G K
                           92.80 1.167E+00  (P 1.420E+00 4.36E-01 G
                           92.38 1.301E+00  (P 1.692E+00 5.18E-01 G

AM-241      -9.4761E-04
                           59.54-9.476E-04 &(P 2.228E-01 6.57E-02 G
   ( - This peak used in the nuclide activity average.

   * - Peak is too wide, but only one peak in library.
   ! - Peak is part of a multiplet and this area went
       negative during deconvolution.
   ? - Peak is too narrow.
   @ - Peak is too wide at FW25M, but ok at FWHM.
   % - Peak fails sensitivity test.
   $ - Peak identified, but first peak of this nuclide
       failed one or more qualification tests.
   + - Peak activity higher than counting uncertainty range.
   - - Peak activity lower than counting uncertainty range.
   = - Peak outside analysis energy range.
   & - Calculated peak centroid is not close enough to the
       library energy centroid for positive identification.
   P - Peakbackground subtraction
   } - Peak is too close to another for the activity
       to be found directly.

   Nuclide Codes:                      Peak Codes:
   T - Thermal Neutron Activation      G - Gamma Ray
   F - Fast Neutron Activation         X - X-Ray
   I - Fission Product                 P - Positron Decay
   N - Naturally Occurring Isotope     S - Single-Escape
   P - Photon Reaction                 D - Double-Escape
   C - Charged Particle Reaction       K - Key Line
   M - No MDA Calculation              A - Not in Average
   R - Coincidence Corrected           C - Coincidence Peak
   H - Halflife limit exceeded

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
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***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	1.5961E-01	1.6628E-01	2.3373E-01	2.3392E-01	2.376E-01
K-40		8.2797E+00	8.2797E+00	1.3198E+00	1.4003E+00	
MN-54	#A	-6.0951E-04	-6.1380E-04	2.7787E-02	2.7787E-02	4.049E-02
CO-57	#B	-2.8582E-03	-2.8814E-03	2.8858E-02	2.8858E-02	3.230E-02
CO-60	#B	6.4916E-03	6.4990E-03	4.1510E-02	4.1512E-02	4.982E-02

Sr-85	#A	-1.6656E-02	-1.7228E-02	4.5110E-02	4.5120E-02	4.864E-02
Kr-85	#A	-4.0995E+02	-4.0996E+02	1.1400E+03	1.1402E+03	1.128E+03
Y-88	#B	4.4081E-03	4.4995E-03	2.8882E-02	2.8884E-02	3.671E-02
NB-94	#B	-1.9559E-03	-1.9559E-03	4.7543E-02	4.7543E-02	4.629E-02
Ag-108M	#B	8.5678E-04	8.5682E-04	2.8372E-02	2.8372E-02	3.479E-02
CD-109	#A	8.2391E-01	8.2790E-01	1.0478E+00	1.0488E+00	1.133E+00
SN-113	#B	2.7579E-04	2.8108E-04	4.0399E-02	4.0399E-02	4.651E-02
SB-125	#B	1.8898E-02	1.8938E-02	9.3580E-02	9.3586E-02	1.071E-01
I-131	#B	5.8652E-04	7.6995E-04	4.1826E-02	4.1826E-02	3.714E-02
CS-134	#B	1.4393E-02	1.4435E-02	1.6356E-02	1.6377E-02	4.468E-02
CS-137	#A	-9.3255E-03	-9.3273E-03	5.4864E-02	5.4866E-02	4.902E-02
CE-139	#A	1.2797E-02	1.3002E-02	3.9347E-02	3.9354E-02	4.302E-02
EU-152	#B	-1.2408E-02	-1.2414E-02	1.3790E-01	1.3790E-01	1.338E-01
EU-154	#B	1.2252E-02	1.2260E-02	7.7393E-02	7.7396E-02	8.656E-02
EU-155	#B	2.8262E-02	2.8296E-02	1.1288E-01	1.1289E-01	1.255E-01
HG-203	#B	5.4271E-03	5.6880E-03	3.9413E-02	3.9415E-02	4.256E-02
TL-208	#	2.3449E-01	2.3449E-01	6.6665E-02	6.7969E-02	
PB-212	#	4.7943E-01	4.7943E-01	9.9372E-02	1.0300E-01	8.610E-02
PB-214	#	4.0152E-01	4.0152E-01	9.6107E-02	9.8749E-02	7.349E-02
BI-212	#	3.9202E-01	3.9202E-01	3.1348E-01	3.1426E-01	
BI-214		3.6878E-01	3.6878E-01	1.2299E-01	1.2474E-01	
RA-224	#	1.2292E+00	1.2292E+00	9.7146E-01	9.7394E-01	1.024E+00
RA-226	#	9.9003E-01	9.9003E-01	9.1572E-01	9.1743E-01	9.735E-01
AC-228	#	5.3892E-01	5.3892E-01	1.5651E-01	1.5944E-01	1.424E-01
TH-227	#B	-1.3833E-01	-1.3833E-01	3.4316E-01	3.4325E-01	3.704E-01
PA-234	#B	-1.2359E-02	-1.2359E-02	1.3456E-01	1.3457E-01	1.509E-01
TH-234	#B	9.6178E-01	9.6178E-01	1.0447E+00	1.0460E+00	1.818E+00
AM-241	#A	-9.4760E-04	-9.4761E-04	5.5001E-01	5.5001E-01	2.228E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (50.2 to 1999.1 keV) 9.2750254E+00 pCi/gm
Total Decayed Activity (50.2 to 1999.1 keV) 9.2750254E+00 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JJM

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 101F_12SEPT2006_1053.An1

Sample description
FSS-OOL-05-10-007-F

Spectrum Filename: C:\GammaVision\Spectra\101F_12SEPT2006_1053.An1

Acquisition information

Start time:	12-Sep-2006 10:53:21
Live time:	2000
Real time:	2002
Dead time:	0.08 %
Detector ID:	1

Detector system
Det 101- DSPE-633

Calibration

Filename:	D1_1LSa.Clb

Detector 101 1.0 Liter Marinelli Sand

Energy Calibration

Created:	03-Sep-2004 08:50:48
Zero offset:	0.244 keV
Gain:	0.500 keV/channel
Quadratic:	-2.493E-08 keV/channel^2

Efficiency Calibration

Created:	03-Sep-2004 08:52:26
Type:	Polynomial
Uncertainty:	0.626 %
Coefficients:	-0.321775 -5.816463 0.734234
	-0.099357 0.006049 -0.000149

Library Files

Main analysis library:	FSS_Rev_1.Lib
Library Match Width:	1.000
Peak stripping:	Library based

Analysis parameters

Analysis engine:	Env32 G53W4.20
Start channel:	100 (50.23keV)
Stop channel:	4000 (1999.11keV)
Peak rejection level:	41.667%
Peak search sensitivity:	3
Sample Size:	1.8860E+03
Activity scaling factor:	1.0000E+06/(1.0000E+00* 1.8860E+03) = 5.3022E+02
Detection limit method:	Nureg 4.16
Random error:	1.0000000E+00
Systematic error:	1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	09-Sep-2006 08:00:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	101_150K_28APR05.Pbc 01-May-2005 05:24:47
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 11 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.0845

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
74.77	130.	32.58	1.50	1.654E-02				
74.77	130.	32.58	1.50	1.654E-02	74.81	9.600	PBC<MDA	PB212
77.17	258.	16.39	1.50	1.720E-02	77.11	17.500	6.145E-01	PB212
					77.11	10.700	9.906E-01	PB214
77.17	255.	16.39	1.50	1.720E-02	77.11	17.500	6.057E-01	PB212
					77.11	10.700	9.906E-01	PB214
92.93	92.	38.73	1.50	1.989E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
92.95	87.	39.25	1.50	1.985E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
186.01	93.	26.51	1.78	1.858E-02	185.99	3.280	1.093E+00	RA226
209.03	70.	37.49	1.29	1.723E-02				
238.85	569.	4.92	1.12	1.556E-02	238.63	43.100	6.005E-01	PB212
242.10	88.	21.28	1.12	1.539E-02	241.00	3.900	PBC<MDA	RA224
					241.92	7.470	PBC<MDA	PB214
270.55	55.	31.92	1.14	1.399E-02				
277.54	52.	32.24	1.29	1.367E-02				
277.54	52.	32.24	1.29	1.367E-02	279.17	81.500	3.508E-02	HG203
295.48	143.	11.52	1.16	1.292E-02	295.22	19.200	4.066E-01	PB214
338.15	118.	16.53	1.30	1.136E-02				
338.15	118.	16.53	1.30	1.136E-02	338.40	12.010	6.088E-01	AC228
351.94	249.	9.49	1.21	1.093E-02				
351.94	249.	9.49	1.21	1.093E-02	351.99	37.100	4.360E-01	PB214
462.86	52.	30.64	1.81	8.353E-03				
462.86	52.	30.64	1.81	8.353E-03	463.51	10.000	4.317E-01	SB125
510.75	90.	17.05	1.32	7.590E-03	510.72	22.500	3.104E-01	TL208
583.26	166.	11.82	1.23	6.683E-03	583.14	86.000	2.043E-01	TL208

609.37	161.	10.67	1.57	6.412E-03	609.32	46.090	3.869E-01	BI214
911.26	118.	10.67	1.47	4.446E-03	911.07	29.000	6.481E-01	AC228
968.21	100.	18.10	1.18	4.215E-03				
968.21	100.	18.10	1.18	4.215E-03	968.90	17.460	9.692E-01	AC228
1120.19	61.	21.05	0.76	3.711E-03	1120.28	15.040	7.808E-01	BI214
1460.96	475.	4.65	1.94	2.942E-03	1460.75	10.700	1.075E+01	K40
1764.21	29.	20.37	1.28	2.481E-03	1764.51	15.920	5.326E-01	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
417.74	209.03	256.	70.	0.035	112.46	1.285	AC-228	
477.41	238.91	107.	569.	0.284	14.76	1.122	PB-212	D
483.89	242.15	130.	88.	0.044	63.84	1.124	PB-214	D
540.82	270.55	109.	55.	0.027	95.76	1.139	AC-228	s
1936.84	968.21	113.	43.	0.021	115.86	1.176	SB-124	s

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-212	149.11	74.77	911.	130.	0.065	97.73	1.499
PB-212	153.79	77.11	767.	258.	0.129	49.18	1.499D
PB-214	153.79	77.11	771.	255.	0.127	49.18	1.499D
TH-234	185.43	92.93	677.	92.	0.046	116.20	1.499s
RA-226	372.21	186.28	357.	95.	0.048	89.46	1.499s
PB-212	477.33	238.82	302.	463.	0.231	20.84	1.499
RA-224	483.32	241.81	328.	84.	0.042	95.87	1.499
HG-203	554.97	277.62	120.	49.	0.024	104.63	1.499s
PB-214	590.58	295.42	120.	142.	0.071	40.61	1.499s
AC-228	676.64	338.43	100.	103.	0.051	49.61	1.499
PB-214	703.90	352.05	97.	223.	0.111	27.20	1.499s
SB-125	925.82	462.96	50.	41.	0.020	83.93	1.499s
TL-208	1021.44	510.75	72.	74.	0.037	51.16	1.315s
TL-208	1166.53	583.26	69.	164.	0.082	35.46	1.234s
BI-214	1218.77	609.37	50.	160.	0.080	32.00	1.567
AC-228	1823.05	911.35	21.	110.	0.055	32.86	1.578
AC-228	1938.64	969.11	39.	60.	0.030	57.96	1.616s
BI-214	2240.96	1120.19	24.	61.	0.030	63.14	0.764s
K-40	2922.93	1460.96	6.	473.	0.236	13.96	1.941
BI-214	3529.85	1764.21	3.	29.	0.015	61.10	1.276s

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Code	MDA Value pCi/gm		COMMENTS
BE-7		-4.8537E-02						
			477.56	-4.854E-02	%(	3.454E-01	9.97E-02	G
K-40		1.0754E+01						
			1460.75	1.075E+01	(P	3.316E-01	5.03E-01	G
MN-54		7.8405E-03						
			834.81	7.840E-03	&(P	5.159E-02	1.48E-02	G
CO-57		-4.8888E-04						
			122.07	-4.889E-04	%(	4.332E-02	1.28E-02	G K
			136.43	1.923E-03	%	3.497E-01	1.03E-01	G
CO-60		2.2322E-03						
			1332.51	2.232E-03	&(P	4.856E-02	1.31E-02	G K
			1173.23	2.043E-03	% P	6.493E-02	1.81E-02	G K
Sr-85		-1.5706E-02						
			514.00	-1.571E-02	&(	5.466E-02	1.63E-02	G
Kr-85		-3.7670E+02						
			513.99	-3.767E+02	&(P	1.226E+03	3.63E+02	G
Y-88		0.0000E+00						
			1836.01	0.000E+00	&(	9.368E-02	2.59E-02	G K
			898.02	-1.640E-03	& P	4.131E-02	1.12E-02	G
NB-94		8.6064E-03						
			871.10	8.606E-03	&(P	2.750E-02	7.94E-03	G K
			702.50	1.770E-02	% P	3.781E-02	1.15E-02	G K
Ag-108M		1.7976E-04						
			722.95	1.798E-04	&(	4.683E-02	1.30E-02	G K
			614.37	1.918E-04	% P	3.969E-02	1.10E-02	G
			433.93	-5.521E-03	%	3.892E-02	1.13E-02	G
CD-109		-4.4044E-02						
			88.04	-4.404E-02	%(P	1.230E+00	3.66E-01	G
SN-113		1.6345E-02						
			391.71	1.635E-02	%(	5.134E-02	1.53E-02	G K
			255.04	9.712E-02	& P	1.440E+00	4.20E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	1.3786E-01						
		427.95	6.643E-02	%(P	1.158E-01	3.55E-02	G K
		600.77	2.287E-02	& P	2.095E-01	5.97E-02	G
		636.15	-2.958E-03	& P	4.462E-01	1.27E-01	G
		463.51	3.493E-01	(P	3.056E-01	1.01E-01	G
		176.29	-2.398E-02	% P	4.951E-01	1.45E-01	G
I-131	9.2084E-03						
		364.48	9.208E-03	&(	4.868E-02	1.42E-02	G K
		636.97	-3.669E-04	&	6.350E-01	1.75E-01	G
		284.29	1.581E-01	%	7.419E-01	2.20E-01	G
CS-134	-4.6433E-03						
		604.66	-4.643E-03	%(P	4.955E-02	1.42E-02	G K
		795.76	-2.490E-03	% P	6.052E-02	1.70E-02	G
		569.29	-5.771E-02	% P	2.594E-01	7.54E-02	G
		801.84	1.185E-01	%	4.753E-01	1.38E-01	G
CS-137	6.9335E-03						
		661.62	6.934E-03	&(P	4.923E-02	1.41E-02	G
CE-139	-1.5108E-04						
		165.85	-1.511E-04	%(P	4.539E-02	1.34E-02	G
EU-152	-5.5236E-03						
		121.78	-5.524E-03	%(P	1.279E-01	3.79E-02	G K
		344.30	2.320E-02	% P	1.222E-01	3.59E-02	G
		1408.08	7.906E-02	% P	1.816E-01	5.45E-02	G
		964.00	-4.226E-02	% P	4.677E-01	1.34E-01	G
		1112.07	-4.234E-02	% P	4.097E-01	1.15E-01	G
		778.90	-7.882E-02	% P	3.568E-01	1.03E-01	G
EU-154	1.1681E-02						
		123.10	1.168E-02	%(P	9.140E-02	2.72E-02	G K
		1274.80	-7.903E-03	& P	1.675E-01	4.63E-02	G
		723.30	3.130E-02	& P	2.127E-01	6.07E-02	G
		1004.80	-2.287E-02	% P	2.915E-01	8.15E-02	G
EU-155	1.4285E-02						
		86.45	1.429E-02	&(	1.378E-01	4.11E-02	G K
		105.31	9.682E-03	&	1.733E-01	5.14E-02	G
HG-203	3.2968E-02						
		279.17	3.297E-02	&(	3.638E-02	1.15E-02	G K
		72.87	-2.541E-01	% P	9.337E-01	2.80E-01	G
		70.83	1.079E+00	&	1.484E+00	4.56E-01	G
		82.50	-5.817E-01	%	2.356E+00	7.08E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	2.0432E-01						
		583.14	2.043E-01	@(P	5.165E-02	2.45E-02	G
		510.72	3.104E-01	+ P	1.773E-01	6.44E-02	G
PB-212	5.1110E-01						
		238.63	4.941E-01	(P	8.938E-02	3.48E-02	G K
							Energy duplication
		77.11	6.145E-01	+	3.136E-01	1.01E-01	G
		74.81	5.876E-01	&(P	6.471E-01	1.99E-01	G
PB-214	3.9999E-01						
		351.99	3.941E-01	@(P	8.612E-02	3.60E-02	G K
		295.22	4.115E-01	@(P	1.555E-01	5.64E-02	G
							Energy duplication
		77.11	9.906E-01	+ P	5.141E-01	1.65E-01	G
		241.92	2.436E-01	% P	6.075E-01	1.83E-01	G
BI-212	1.8787E-01						
		727.17	1.879E-01	%(P	3.282E-01	1.01E-01	G K
		1620.56	-1.145E-01	%	1.415E+00	3.65E-01	G
		785.42	6.755E-01	% P	2.302E+00	6.76E-01	G
BI-214	3.8689E-01						
		609.32	3.869E-01	(P	8.678E-02	4.16E-02	G K
		1764.51	5.326E-01	+ P	1.864E-01	1.10E-01	G
		1120.28	7.808E-01	+ P	3.290E-01	1.65E-01	G
RA-224	1.0040E+00						
		241.00	1.004E+00	(P	1.036E+00	3.24E-01	G
RA-226	1.1221E+00						
		185.99	1.122E+00	*(	1.067E+00	3.35E-01	G
AC-228	5.8948E-01						
		911.07	6.121E-01	(P	1.341E-01	6.82E-02	G K
		968.90	5.860E-01	@(P	3.115E-01	1.15E-01	G
		338.40	5.398E-01	(P	2.594E-01	9.12E-02	G
TH-227	-4.7095E-02						
		236.00	-4.709E-02	%(P	3.355E-01	9.93E-02	G K
		256.25	6.442E-04	% P	5.147E-01	1.50E-01	G
PA-234	-2.9803E-03						
		98.44	-2.980E-03	%(	1.730E-01	5.14E-02	G K
		946.00	-2.154E-02	&	2.701E-01	7.63E-02	G
		131.28	4.761E-02	&	1.727E-01	5.18E-02	G
		94.67	-6.780E-02	%	2.878E-01	8.64E-02	G
		883.24	7.866E-02	%	3.365E-01	9.68E-02	G
		926.70	1.578E-03	%	4.291E-01	1.18E-01	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26-8.218E-02 %   3.824E-01 1.12E-01 G

TH-234       8.8105E-01
                           63.29 7.111E-01 %(P 1.807E+00 5.44E-01 G K
                           92.80 1.102E+00  (P 1.489E+00 4.56E-01 G
                           92.38 1.220E+00 % P 1.767E+00 5.39E-01 G

AM-241      -3.7658E-02
                           59.54-3.766E-02 %(P 2.670E-01 7.96E-02 G
   ( - This peak used in the nuclide activity average.

   * - Peak is too wide, but only one peak in library.
   ! - Peak is part of a multiplet and this area went
       negative during deconvolution.
   ? - Peak is too narrow.
   @ - Peak is too wide at FW25M, but ok at FWHM.
   % - Peak fails sensitivity test.
   $ - Peak identified, but first peak of this nuclide
       failed one or more qualification tests.
   + - Peak activity higher than counting uncertainty range.
   - - Peak activity lower than counting uncertainty range.
   = - Peak outside analysis energy range.
   & - Calculated peak centroid is not close enough to the
       library energy centroid for positive identification.
   P - Peakbackground subtraction
   } - Peak is too close to another for the activity
       to be found directly.

   Nuclide Codes:                      Peak Codes:
   T - Thermal Neutron Activation      G - Gamma Ray
   F - Fast Neutron Activation         X - X-Ray
   I - Fission Product                 P - Positron Decay
   N - Naturally Occurring Isotope     S - Single-Escape
   P - Photon Reaction                 D - Double-Escape
   C - Charged Particle Reaction       K - Key Line
   M - No MDA Calculation              A - Not in Average
   R - Coincidence Corrected           C - Coincidence Peak
   H - Halflife limit exceeded

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
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***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	-4.6611E-02	-4.8537E-02	2.9904E-01	2.9905E-01	3.317E-01
K-40		1.0754E+01	1.0754E+01	1.5079E+00	1.6257E+00	
MN-54	#A	7.7864E-03	7.8405E-03	4.4379E-02	4.4381E-02	5.124E-02
CO-57	#B	-4.8498E-04	-4.8888E-04	3.8474E-02	3.8474E-02	4.297E-02
CO-60	#B	2.2297E-03	2.2322E-03	3.9190E-02	3.9190E-02	4.850E-02

Sr-85	#A	-1.5191E-02	-1.5706E-02	4.8778E-02	4.8786E-02	5.287E-02
Kr-85	#A	-3.7669E+02	-3.7670E+02	1.2506E+03	1.2507E+03	1.226E+03
Y-88	#B	0.0000E+00	0.0000E+00	7.7694E-02	7.7694E-02	9.179E-02
NB-94	#B	8.6064E-03	8.6064E-03	2.3815E-02	2.3820E-02	2.750E-02
Ag-108M	#B	1.7975E-04	1.7976E-04	3.9099E-02	3.9099E-02	4.683E-02
CD-109	#A	-4.3834E-02	-4.4044E-02	1.3530E+00	1.3530E+00	1.224E+00
SN-113	#B	1.6041E-02	1.6345E-02	4.5789E-02	4.5798E-02	5.039E-02
SB-125	#F	1.3756E-01	1.3786E-01	1.1982E-01	1.2007E-01	1.156E-01
I-131	#B	7.0364E-03	9.2084E-03	4.2695E-02	4.2698E-02	3.720E-02
CS-134	#B	-4.6300E-03	-4.6433E-03	5.7854E-02	5.7854E-02	4.941E-02
CS-137	#A	6.9321E-03	6.9335E-03	4.2175E-02	4.2177E-02	4.922E-02
CE-139	#A	-1.4872E-04	-1.5108E-04	2.6301E-02	2.6301E-02	4.468E-02
EU-152	#B	-5.5210E-03	-5.5236E-03	1.5846E-01	1.5846E-01	1.278E-01
EU-154	#B	1.1673E-02	1.1681E-02	8.1654E-02	8.1656E-02	9.134E-02
EU-155	#B	1.4268E-02	1.4285E-02	1.2325E-01	1.2326E-01	1.377E-01
HG-203	#A	3.1473E-02	3.2968E-02	3.4496E-02	3.4546E-02	3.473E-02
TL-208	#	2.0432E-01	2.0432E-01	7.3503E-02	7.4404E-02	
PB-212	#	5.1110E-01	5.1110E-01	1.0792E-01	1.1172E-01	8.938E-02
PB-214	#	3.9999E-01	3.9999E-01	9.8875E-02	1.0143E-01	8.612E-02
BI-212	#B	1.8787E-01	1.8787E-01	3.0280E-01	3.0299E-01	3.282E-01
BI-214		3.8689E-01	3.8689E-01	1.2466E-01	1.2656E-01	
RA-224	#A	1.0040E+00	1.0040E+00	9.7065E-01	9.7231E-01	1.036E+00
RA-226	#	1.1221E+00	1.1221E+00	1.0038E+00	1.0058E+00	1.067E+00
AC-228	#	5.8948E-01	5.8948E-01	1.6585E-01	1.6916E-01	1.341E-01
TH-227	#B	-4.7095E-02	-4.7095E-02	3.2135E-01	3.2136E-01	3.355E-01
PA-234	#B	-2.9803E-03	-2.9803E-03	1.5413E-01	1.5413E-01	1.730E-01
TH-234	#B	8.8105E-01	8.8105E-01	1.0928E+00	1.0938E+00	1.807E+00
AM-241	#A	-3.7658E-02	-3.7658E-02	2.6631E-01	2.6632E-01	2.670E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (270.1 to 1999.1 keV) 1.1344769E+01 pCi/gm
Total Decayed Activity (270.1 to 1999.1 keV) 1.1344769E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JPK

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 101F_12SEPT2006_1134.An1

Sample description
FSS-OOL-05-10-006-F

Spectrum Filename: C:\GammaVision\Spectra\101F_12SEPT2006_1134.An1

Acquisition information

Start time:	12-Sep-2006 11:34:07
Live time:	2000
Real time:	2001
Dead time:	0.07 %
Detector ID:	1

Detector system
Det 101- DSPE-633

Calibration

Filename:	D1_1LSa.Clb

Detector 101 1.0 Liter Marinelli Sand

Energy Calibration

Created:	03-Sep-2004 08:50:48
Zero offset:	0.244 keV
Gain:	0.500 keV/channel
Quadratic:	-2.493E-08 keV/channel^2

Efficiency Calibration

Created:	03-Sep-2004 08:52:26
Type:	Polynomial
Uncertainty:	0.626 %
Coefficients:	-0.321775 -5.816463 0.734234
	-0.099357 0.006049 -0.000149

Library Files

Main analysis library:	FSS_Rev_1.Lib
Library Match Width:	1.000
Peak stripping:	Library based

Analysis parameters

Analysis engine:	Env32 G53W4.20
Start channel:	100 (50.23keV)
Stop channel:	4000 (1999.11keV)
Peak rejection level:	41.667%
Peak search sensitivity:	3
Sample Size:	2.0250E+03
Activity scaling factor:	1.0000E+06/(1.0000E+00* 2.0250E+03) = 4.9383E+02
Detection limit method:	Nureg 4.16
Random error:	1.0000000E+00
Systematic error:	1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	09-Sep-2006 08:42:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	101_150K_28APR05.Pbc 01-May-2005 05:24:47
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 12 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.0795

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
74.42	107.	26.09	1.00	1.651E-02				
74.42	107.	26.09	1.00	1.651E-02	74.81	9.600	PBC<MDA	PB212
77.21	294.	9.42	1.01	1.731E-02	77.11	17.500	6.515E-01	PB212
					77.11	10.700	1.052E+00	PB214
92.77	126.	27.10	1.25	1.989E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	1.334E+00	TH234
185.77	110.	21.57	1.25	1.860E-02	185.99	3.280	1.209E+00	RA226
209.73	54.	34.74	1.20	1.719E-02				
238.85	436.	5.84	1.12	1.557E-02	238.63	43.100	4.271E-01	PB212
241.94	95.	18.57	1.12	1.540E-02	241.00	3.900	1.044E+00	RA224
					241.92	7.470	PBC<MDA	PB214
270.78	49.	38.69	1.20	1.398E-02				
295.61	156.	12.61	1.08	1.290E-02	295.22	19.200	4.138E-01	PB214
338.39	107.	20.58	1.33	1.135E-02				
338.39	107.	20.58	1.33	1.135E-02	338.40	12.010	5.131E-01	AC228
352.09	318.	8.80	1.26	1.092E-02	351.99	37.100	5.195E-01	PB214
462.64	52.	32.71	1.11	8.357E-03				
462.64	52.	32.71	1.11	8.357E-03	463.51	10.000	4.069E-01	SB125
510.71	89.	19.47	2.00	7.591E-03	510.72	22.500	2.851E-01	TL208
583.58	126.	10.96	1.34	6.680E-03	583.14	86.000	1.429E-01	TL208
609.42	198.	9.00	1.48	6.412E-03	609.32	46.090	4.441E-01	BI214
726.51	46.	30.72	1.27	5.447E-03				
726.51	46.	30.72	1.27	5.447E-03	727.17	11.800	4.657E-01	BI212
911.85	67.	17.73	1.88	4.443E-03	911.07	29.000	3.360E-01	AC228
968.33	80.	20.31	1.20	4.214E-03				
968.33	80.	20.31	1.20	4.214E-03	968.90	17.460	7.203E-01	AC228
1120.45	38.	21.58	0.80	3.710E-03	1120.28	15.040	4.546E-01	BI214

1460.92	345.	5.46	1.67	2.942E-03	1460.75	10.700	7.268E+00	K40
1764.64	53.	13.74	1.46	2.481E-03	1764.51	15.920	8.879E-01	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
148.42	74.72	334.	107.	0.053	78.27	1.005	BI-207	D
153.99	77.50	236.	294.	0.147	28.25	1.007	PB-214	D
419.14	209.73	149.	54.	0.027	104.23	1.203	NP-239	
477.40	238.81	106.	436.	0.218	17.53	1.122	PB-212	D
483.59	241.90	108.	95.	0.047	55.72	1.124	PB-214	D
541.28	270.78	132.	49.	0.025	116.06	1.203	AC-228	s
1453.17	726.51	40.	46.	0.023	92.15	1.267	J-132	l
1937.08	968.33	69.	54.	0.027	77.64	1.202	SB-124	s

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-212	149.08	74.76	810.	99.	0.050	118.56	1.499
PB-212	153.79	77.11	679.	238.	0.119	50.36	1.499D
PB-214	153.79	77.11	683.	234.	0.117	50.36	1.499D
TH-234	185.43	92.93	610.	111.	0.056	89.28	1.499s
TH-234	185.36	92.89	585.	117.	0.059	87.02	1.499s
RA-226	371.19	185.77	208.	110.	0.055	64.71	1.253s
PB-212	477.23	238.77	334.	351.	0.176	26.73	1.499
PB-214	590.81	295.53	128.	156.	0.078	38.48	1.499
AC-228	676.58	338.40	106.	91.	0.045	56.11	1.499D
PB-214	703.94	352.07	97.	283.	0.141	22.95	1.499
SB-125	926.88	463.49	52.	28.	0.014	114.36	1.499
TL-208	1021.37	510.71	82.	73.	0.036	58.40	1.999s
TL-208	1167.17	583.58	28.	123.	0.062	32.88	1.343s
BI-214	1218.88	609.42	45.	197.	0.098	27.01	1.481
AC-228	1823.68	911.66	31.	56.	0.028	55.84	1.578
BI-214	2241.49	1120.45	13.	38.	0.019	64.73	0.798s
K-40	2922.85	1460.92	5.	343.	0.171	16.39	1.670
BI-214	3530.71	1764.64	0.	53.	0.026	41.21	1.457s

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	MDA Value pCi/gm	COMMENTS
BE-7		1.9292E-02					
			477.56	1.929E-02	%(	3.020E-01 8.57E-02	G
K-40		7.2684E+00					
			1460.75	7.268E+00	(P	2.801E-01 4.00E-01	G
MN-54		1.1773E-02					
			834.81	1.177E-02	&(P	3.234E-02 9.52E-03	G
CO-57		-3.0250E-04					
			122.07	-3.025E-04	%(	3.978E-02 1.18E-02	G K
			136.43	-3.601E-02	&	3.204E-01 9.53E-02	G
CO-60		1.8522E-03					
			1332.51	1.852E-03	%(P	4.332E-02 1.16E-02	G K
			1173.23	-6.079E-03	% P	4.318E-02 1.20E-02	G K
Sr-85		-1.5805E-02					
			514.00	-1.580E-02	%(	4.646E-02 1.39E-02	G
Kr-85		-3.7713E+02					
			513.99	-3.771E+02	%(P	1.043E+03 3.10E+02	G
Y-88		-5.5197E-03					
			1836.01	-5.520E-03	%(	4.014E-02 1.06E-02	G K
			898.02	-9.700E-03	% P	4.847E-02 1.39E-02	G
NB-94		2.1402E-03					
			871.10	2.140E-03	%(P	3.073E-02 8.31E-03	G K
			702.50	8.402E-03	& P	3.505E-02 1.02E-02	G K
Ag-108M		-3.9088E-03					
			722.95	-3.909E-03	&(	4.352E-02 1.23E-02	G K
			614.37	-1.862E-02	& P	4.615E-02 1.38E-02	G
			433.93	1.610E-02	%	2.986E-02 9.14E-03	G
CD-109		1.7137E-03					
			88.04	1.714E-03	%(P	1.149E+00 3.41E-01	G
SN-113		-1.2388E-02					
			391.71	-1.239E-02	%(	5.101E-02 1.50E-02	G K
			255.04	-2.263E-02	& P	1.271E+00 3.68E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	8.3291E-02						
		427.95	3.425E-02	%(P	9.303E-02	2.77E-02	G K
		600.77	3.465E-02	& P	1.747E-01	5.03E-02	G
		636.15	-5.193E-02	& P	2.658E-01	7.56E-02	G
		463.51	2.284E-01	(P	2.901E-01	9.15E-02	G
		176.29	-1.083E-02	% P	4.580E-01	1.34E-01	G
I-131	-3.4270E-03						
		364.48	-3.427E-03	%(	4.968E-02	1.44E-02	G K
		636.97	-7.121E-02	%	5.355E-01	1.51E-01	G
		284.29	2.083E-02	&	5.762E-01	1.67E-01	G
CS-134	-1.1003E-02						
		604.66	-1.100E-02	&(P	4.589E-02	1.34E-02	G K
		795.76	8.598E-03	% P	4.480E-02	1.28E-02	G
		569.29	-1.698E-02	% P	2.103E-01	5.91E-02	G
		801.84	7.570E-03	%	3.838E-01	1.04E-01	G
CS-137	8.7540E-03						
		661.62	8.754E-03	%(P	4.042E-02	1.16E-02	G
CE-139	-1.3254E-02						
		165.85	-1.325E-02	%(P	3.999E-02	1.20E-02	G
EU-152	9.8003E-03						
		121.78	9.800E-03	&(P	1.007E-01	2.98E-02	G K
		344.30	-3.231E-02	% P	1.188E-01	3.51E-02	G
		1408.08	1.959E-02	& P	2.183E-01	5.93E-02	G
		964.00	2.944E-03	% P	4.144E-01	1.17E-01	G
		1112.07	-1.377E-02	% P	2.974E-01	8.02E-02	G
		778.90	-2.748E-02	& P	2.849E-01	7.98E-02	G
EU-154	-1.4267E-02						
		123.10	-1.427E-02	%(P	8.529E-02	2.54E-02	G K
		1274.80	3.656E-02	% P	1.134E-01	3.31E-02	G
		723.30	-1.695E-02	& P	1.990E-01	5.59E-02	G
		1004.80	-1.379E-03	& P	2.375E-01	6.44E-02	G
EU-155	-5.6880E-03						
		86.45	-5.688E-03	%(	1.354E-01	4.03E-02	G K
		105.31	3.642E-02	&	1.464E-01	4.38E-02	G
HG-203	-3.6383E-03						
		279.17	-3.638E-03	&(	4.040E-02	1.18E-02	G K
		72.87	-7.243E-02	% P	8.781E-01	2.61E-01	G
		70.83	1.398E-02	%	1.943E+00	5.79E-01	G
		82.50	-2.165E-01	&	2.019E+00	6.02E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	1.4293E-01						
		583.14	1.429E-01	*(P	3.171E-02	1.60E-02	G
		510.72	2.851E-01	+ P	1.755E-01	6.78E-02	G
PB-212	3.6163E-01						
		238.63	3.490E-01	(P	8.735E-02	3.16E-02	G K
							Energy duplication
		77.11	5.277E-01	+	2.752E-01	8.86E-02	G
		74.81	4.181E-01	&(P	5.687E-01	1.74E-01	G
PB-214	4.4982E-01						
		351.99	4.652E-01	(P	7.985E-02	3.58E-02	G K
		295.22	4.201E-01	(P	1.492E-01	5.45E-02	G
							Energy duplication
		77.11	8.495E-01	+ P	4.513E-01	1.45E-01	G
		241.92	-5.673E-02	% P	6.455E-01	1.92E-01	G
BI-212	2.1070E-01						
		727.17	2.107E-01	%(P	3.312E-01	1.03E-01	G K
		1620.56	-1.105E-01	%	1.041E+00	2.61E-01	G
		785.42	9.794E-01	% P	1.451E+00	4.61E-01	G
BI-214	4.4668E-01						
		609.32	4.441E-01	(P	7.694E-02	4.02E-02	G K
		1764.51	8.879E-01	+ P	1.245E-01	1.23E-01	G
		1120.28	4.546E-01	(P	2.332E-01	9.91E-02	G
RA-224	6.9673E-01						
		241.00	6.967E-01	%(P	9.825E-01	3.02E-01	G
RA-226	1.2087E+00						
		185.99	1.209E+00	@(	7.648E-01	2.61E-01	G
AC-228	3.3381E-01						
		911.07	2.884E-01	(P	1.473E-01	5.55E-02	G K
		968.90	2.273E-01	% P	3.423E-01	1.06E-01	G
							Energy duplication
		338.40	4.434E-01	@(P	2.485E-01	8.49E-02	G
TH-227	-1.0659E-01						
		236.00	-1.066E-01	&(P	3.842E-01	1.15E-01	G K
		256.25	-6.520E-03	% P	4.718E-01	1.37E-01	G
PA-234	-9.4663E-04						
		98.44	-9.466E-04	&(	1.326E-01	3.92E-02	G K
		946.00	1.764E-02	&	1.568E-01	4.28E-02	G
		131.28	3.270E-03	%	1.373E-01	4.04E-02	G
		94.67	-5.819E-02	%	2.617E-01	7.85E-02	G
		883.24	-2.533E-02	%	2.974E-01	8.21E-02	G
		926.70	3.863E-03	&	3.561E-01	9.70E-02	G

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 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26-2.086E-02 %   3.096E-01 8.74E-02 G

TH-234       1.0333E+00
                           63.29 5.424E-01 %(P 1.648E+00 4.94E-01 G K
                           92.80 1.311E+00  (P 1.290E+00 4.00E-01 G
                           92.38 1.455E+00  (P 1.541E+00 4.75E-01 G

AM-241       2.0642E-03
                           59.54 2.064E-03 %(P 2.249E-01 6.65E-02 G
   ( - This peak used in the nuclide activity average.

   * - Peak is too wide, but only one peak in library.
   ! - Peak is part of a multiplet and this area went
       negative during deconvolution.
   ? - Peak is too narrow.
   @ - Peak is too wide at FW25M, but ok at FWHM.
   % - Peak fails sensitivity test.
   $ - Peak identified, but first peak of this nuclide
       failed one or more qualification tests.
   + - Peak activity higher than counting uncertainty range.
   - - Peak activity lower than counting uncertainty range.
   = - Peak outside analysis energy range.
   & - Calculated peak centroid is not close enough to the
       library energy centroid for positive identification.
   P - Peakbackground subtraction
   } - Peak is too close to another for the activity
       to be found directly.

   Nuclide Codes:                      Peak Codes:
   T - Thermal Neutron Activation      G - Gamma Ray
   F - Fast Neutron Activation         X - X-Ray
   I - Fission Product                 P - Positron Decay
   N - Naturally Occurring Isotope     S - Single-Escape
   P - Photon Reaction                 D - Double-Escape
   C - Charged Particle Reaction       K - Key Line
   M - No MDA Calculation              A - Not in Average
   R - Coincidence Corrected           C - Coincidence Peak
   H - Halflife limit exceeded

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
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***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	1.8526E-02	1.9292E-02	2.5724E-01	2.5724E-01	2.900E-01
K-40		7.2684E+00	7.2684E+00	1.1995E+00	1.2679E+00	
MN-54	#A	1.1692E-02	1.1773E-02	2.8572E-02	2.8580E-02	3.212E-02
CO-57	#B	-3.0008E-04	-3.0250E-04	3.5319E-02	3.5319E-02	3.947E-02
CO-60	#B	1.8502E-03	1.8522E-03	3.4727E-02	3.4727E-02	4.327E-02

Sr-85	#A	-1.5286E-02	-1.5805E-02	4.1630E-02	4.1639E-02	4.494E-02
Kr-85	#A	-3.7712E+02	-3.7713E+02	1.0570E+03	1.0573E+03	1.043E+03
Y-88	#B	-5.4088E-03	-5.5197E-03	3.1799E-02	3.1800E-02	3.934E-02
NB-94	#B	2.1402E-03	2.1402E-03	2.4935E-02	2.4935E-02	3.073E-02
Ag-108M	#B	-3.9086E-03	-3.9088E-03	3.6943E-02	3.6944E-02	4.352E-02
CD-109	#A	1.7055E-03	1.7137E-03	1.0235E+00	1.0235E+00	1.144E+00
SN-113	#B	-1.2158E-02	-1.2388E-02	4.5135E-02	4.5141E-02	5.006E-02
SB-125	#B	8.3113E-02	8.3291E-02	1.0009E-01	1.0020E-01	9.283E-02
I-131	#B	-2.6189E-03	-3.4270E-03	4.3084E-02	4.3084E-02	3.796E-02
CS-134	#B	-1.0971E-02	-1.1003E-02	4.5355E-02	4.5360E-02	4.576E-02
CS-137	#A	8.7523E-03	8.7540E-03	3.4844E-02	3.4848E-02	4.041E-02
CE-139	#A	-1.3047E-02	-1.3254E-02	3.6815E-02	3.6822E-02	3.936E-02
EU-152	#B	9.7958E-03	9.8003E-03	8.9475E-02	8.9476E-02	1.006E-01
EU-154	#B	-1.4257E-02	-1.4267E-02	8.4301E-02	8.4304E-02	8.523E-02
EU-155	#B	-5.6812E-03	-5.6880E-03	1.2090E-01	1.2090E-01	1.353E-01
HG-203	#B	-3.4733E-03	-3.6383E-03	3.5517E-02	3.5518E-02	3.857E-02
TL-208	#	1.4293E-01	1.4293E-01	4.7909E-02	4.8585E-02	
PB-212	#	3.6163E-01	3.6163E-01	9.8340E-02	1.0044E-01	8.735E-02
PB-214	#	4.4982E-01	4.4982E-01	1.0180E-01	1.0493E-01	7.985E-02
BI-212	#B	2.1070E-01	2.1070E-01	3.0848E-01	3.0871E-01	3.312E-01
BI-214		4.4668E-01	4.4668E-01	1.2133E-01	1.2392E-01	
RA-224	#A	6.9673E-01	6.9673E-01	9.0591E-01	9.0676E-01	9.825E-01
RA-226	#	1.2087E+00	1.2087E+00	7.8221E-01	7.8518E-01	
AC-228	#	3.3381E-01	3.3381E-01	1.3593E-01	1.3723E-01	1.473E-01
TH-227	#B	-1.0659E-01	-1.0659E-01	3.5638E-01	3.5643E-01	3.842E-01
PA-234	#B	-9.4663E-04	-9.4663E-04	1.1755E-01	1.1755E-01	1.326E-01
TH-234	#B	1.0333E+00	1.0333E+00	9.4660E-01	9.4834E-01	1.648E+00
AM-241	#A	2.0642E-03	2.0642E-03	1.9950E-01	1.9950E-01	2.249E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (270.6 to 1999.1 keV) 9.0667868E+00 pCi/gm
Total Decayed Activity (270.6 to 1999.1 keV) 9.0667906E+00 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JPK

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 101F_13SEPT2006_0818.An1

Sample description
FSS-OOL-05-10-010-F

Spectrum Filename: C:\GammaVision\Spectra\101F_13SEPT2006_0818.An1

Acquisition information
Start time: 13-Sep-2006 08:18:34
Live time: 2000
Real time: 2002
Dead time: 0.10 %
Detector ID: 1

Detector system
Det 101- DSPE-633

Calibration
Filename: D1_1LSa.Clb
Detector 101 1.0 Liter Marinelli Sand

Energy Calibration
Created: 03-Sep-2004 08:50:48
Zero offset: 0.244 keV
Gain: 0.500 keV/channel
Quadratic: -2.493E-08 keV/channel^2

Efficiency Calibration
Created: 03-Sep-2004 08:52:26
Type: Polynomial
Uncertainty: 0.626 %
Coefficients: -0.321775 -5.816463 0.734234
-0.099357 0.006049 -0.000149

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.23keV)
Stop channel: 4000 (1999.11keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 1.8910E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.8910E+03) =
5.2882E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	09-Sep-2006 10:25:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	101_150K_28APR05.Pbc 01-May-2005 05:24:47
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 13 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.0944

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
74.73	157.	28.28	1.50	1.654E-02				
74.73	157.	28.28	1.50	1.654E-02	74.81	9.600	7.083E-01	PB212
77.07	252.	17.68	1.50	1.720E-02	77.11	17.500	5.974E-01	PB212
					77.11	10.700	9.627E-01	PB214
77.07	248.	17.68	1.50	1.720E-02	77.11	17.500	5.886E-01	PB212
					77.11	10.700	9.627E-01	PB214
86.81	86.	30.46	1.01	1.917E-02	86.45	32.740	9.804E-02	EU155
90.08	103.	26.28	1.02	1.960E-02				
93.22	124.	21.64	1.02	1.995E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
186.19	93.	28.87	1.72	1.857E-02	185.99	3.280	1.090E+00	RA226
238.77	538.	5.32	1.12	1.557E-02	238.63	43.100	5.661E-01	PB212
241.88	94.	23.06	1.12	1.541E-02	241.00	3.900	PBC<MDA	RA224
					241.92	7.470	PBC<MDA	PB214
276.99	43.	37.49	1.06	1.370E-02				
295.34	157.	17.07	1.11	1.292E-02	295.22	19.200	4.483E-01	PB214
338.59	131.	16.44	1.12	1.134E-02	338.40	12.010	6.732E-01	AC228
351.94	298.	8.41	1.13	1.093E-02				
351.94	298.	8.41	1.13	1.093E-02	351.99	37.100	5.219E-01	PB214
462.67	57.	28.93	1.14	8.357E-03				
462.67	57.	28.93	1.14	8.357E-03	463.51	10.000	4.781E-01	SB125
477.37	27.	39.68	1.50	8.102E-03	477.56	10.300	PBC<MDA	BE7
510.72	64.	23.26	1.00	7.591E-03	510.72	22.500	2.028E-01	TL208
583.20	171.	10.97	1.32	6.684E-03	583.14	86.000	2.100E-01	TL208
609.22	199.	8.70	1.35	6.414E-03	609.32	46.090	4.785E-01	BI214
727.35	43.	33.19	1.28	5.442E-03	727.17	11.800	PBC<MDA	BI212
910.69	125.	11.10	1.61	4.448E-03	911.07	29.000	6.841E-01	AC228

968.38	92.	16.83	1.36	4.214E-03	968.90	17.460	8.918E-01	AC228
1120.92	66.	25.35	1.52	3.711E-03	1120.28	15.040	8.440E-01	BI214
1460.59	535.	4.48	2.18	2.943E-03	1460.75	10.700	1.210E+01	K40
1764.54	32.	17.68	1.70	2.481E-03	1764.51	15.920	5.710E-01	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide
173.19	86.93	297.	86.	0.043	91.38	1.013	TB-160 lD
179.74	90.21	312.	103.	0.051	78.83	1.016	PB-214 lD
477.23	238.67	140.	538.	0.269	15.95	1.122	PB-212 D
483.47	241.78	187.	94.	0.047	69.17	1.124	PB-214 D

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-212	149.03	74.73	982.	157.	0.079	84.85	1.499s
PB-212	153.79	77.11	864.	252.	0.126	53.04	1.499D
PB-214	153.79	77.11	868.	248.	0.124	53.04	1.499D
TH-234	185.35	92.89	785.	126.	0.063	89.91	1.499s
TH-234	185.38	92.90	738.	137.	0.069	83.80	1.499s
RA-226	371.94	186.14	363.	89.	0.045	95.87	1.499s
PB-212	477.27	238.79	374.	485.	0.243	21.38	1.499
PB-214	590.49	295.37	199.	133.	0.066	51.32	1.499
AC-228	676.96	338.59	125.	128.	0.064	49.32	1.117
PB-214	703.60	351.90	120.	242.	0.121	26.95	1.499
SB-125	926.40	463.25	75.	46.	0.023	87.46	1.499
BE-7	954.66	477.37	44.	27.	0.014	119.05	1.499s
TL-208	1021.37	510.72	76.	48.	0.024	69.79	0.996
TL-208	1166.42	583.20	65.	169.	0.084	32.91	1.321
BI-214	1218.48	609.22	43.	198.	0.099	26.10	1.354s
BI-212	1454.40	727.13	73.	77.	0.039	73.58	1.321
AC-228	1821.72	910.69	23.	123.	0.062	33.31	1.610s
AC-228	1937.17	968.38	41.	92.	0.046	50.49	1.364
BI-214	2242.44	1120.92	53.	66.	0.033	76.04	1.518s
K-40	2922.19	1460.59	15.	533.	0.267	13.43	2.176
BI-214	3530.52	1764.54	0.	32.	0.016	53.03	1.699

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Code	MDA Value pCi/gm		COMMENTS
BE-7		2.4469E-01						
			477.56	2.447E-01	*(	3.045E-01	9.71E-02	G
K-40		1.2101E+01						
			1460.75	1.210E+01	(P	4.695E-01	5.44E-01	G
MN-54		1.4852E-03						
			834.81	1.485E-03	&(P	4.193E-02	1.15E-02	G
CO-57		6.3651E-03						
			122.07	6.365E-03	%(	4.457E-02	1.33E-02	G K
			136.43	-3.638E-02	%	3.672E-01	1.09E-01	G
CO-60		2.9598E-02						
			1332.51	2.960E-02	%(P	4.018E-02	1.32E-02	G K
			1173.23	-1.373E-03	% P	5.431E-02	1.49E-02	G K
Sr-85		-1.3201E-02						
			514.00	-1.320E-02	%(	4.401E-02	1.31E-02	G
Kr-85		-3.1834E+02						
			513.99	-3.183E+02	%(P	9.812E+02	2.89E+02	G
Y-88		1.3536E-02						
			1836.01	1.354E-02	&(	4.042E-02	1.17E-02	G K
			898.02	2.518E-03	& P	4.850E-02	1.34E-02	G
NB-94		-2.9057E-03						
			871.10	-2.906E-03	%(P	4.064E-02	1.12E-02	G K
			702.50	9.995E-03	& P	3.934E-02	1.15E-02	G K
Ag-108M		1.9688E-02						
			722.95	1.969E-02	%(	4.318E-02	1.31E-02	G K
			614.37	6.610E-03	% P	4.532E-02	1.30E-02	G
			433.93	1.130E-02	%	3.527E-02	1.05E-02	G
CD-109		3.8357E-02						
			88.04	3.836E-02	&(P	1.219E+00	3.62E-01	G
SN-113		9.6679E-03						
			391.71	9.668E-03	%(	6.253E-02	1.83E-02	G K
			255.04	-1.485E-01	& P	1.806E+00	5.31E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	1.0536E-01						
		427.95	6.061E-03	%(P	1.095E-01	3.12E-02	G K
		600.77	-3.284E-02	% P	2.236E-01	6.43E-02	G
		636.15	7.984E-02	% P	3.242E-01	9.42E-02	G
		463.51	3.993E-01	(P	3.702E-01	1.20E-01	G
		176.29	-2.089E-02	% P	5.733E-01	1.69E-01	G
I-131	2.4849E-03						
		364.48	2.485E-03	&(	7.011E-02	2.04E-02	G K
		636.97	3.114E-01	%	5.820E-01	1.79E-01	G
		284.29	-1.690E-01	&	8.487E-01	2.52E-01	G
CS-134	-4.3364E-03						
		604.66	-4.336E-03	%(P	1.090E-01	3.22E-02	G K
		795.76	1.879E-02	% P	4.587E-02	1.37E-02	G
		569.29	2.212E-02	& P	2.173E-01	6.14E-02	G
		801.84	2.045E-02	&	4.810E-01	1.34E-01	G
CS-137	1.1900E-02						
		661.62	1.190E-02	%(P	4.718E-02	1.37E-02	G
CE-139	-1.2274E-02						
		165.85	-1.227E-02	&(P	4.649E-02	1.39E-02	G
EU-152	2.3324E-02						
		121.78	2.332E-02	%(P	1.315E-01	3.93E-02	G K
		344.30	-2.996E-03	% P	1.225E-01	3.51E-02	G
		1408.08	5.223E-02	% P	2.133E-01	6.04E-02	G
		964.00	9.373E-02	& P	4.167E-01	1.21E-01	G
		1112.07	-5.752E-02	% P	4.337E-01	1.23E-01	G
		778.90	-4.503E-03	% P	3.148E-01	8.68E-02	G
EU-154	8.2187E-03						
		123.10	8.219E-03	&(P	9.876E-02	2.94E-02	G K
		1274.80	1.042E-02	% P	1.686E-01	4.68E-02	G
		723.30	7.428E-02	& P	2.188E-01	6.47E-02	G
		1004.80	-3.042E-02	% P	3.044E-01	8.59E-02	G
EU-155	3.6557E-03						
		86.45	3.656E-03	%(	1.731E-01	5.16E-02	G K
		105.31	2.105E-02	%	1.835E-01	5.47E-02	G
HG-203	-1.3088E-02						
		279.17	-1.309E-02	%(	5.080E-02	1.52E-02	G K
		72.87	-4.639E-01	% P	1.227E+00	3.70E-01	G
		70.83	-3.858E-02	%	1.886E+00	5.61E-01	G
		82.50	3.294E-01	%	2.371E+00	7.09E-01	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments

TL-208       2.0851E-01
                          583.14 2.100E-01  (P 5.010E-02 2.34E-02 G
                          510.72 2.028E-01  (P 1.808E-01 6.28E-02 G

PB-212       5.3988E-01
                          238.63 5.165E-01  (P 9.877E-02 3.73E-02 G K
                                                          Energy duplication
                           77.11 5.974E-01  (  3.316E-01 1.06E-01 G
                           74.81 7.083E-01 & P 6.694E-01 2.07E-01 G

PB-214       4.1136E-01
                          351.99 4.263E-01  (P 9.473E-02 3.86E-02 G K
                          295.22 3.825E-01  (P 1.974E-01 6.63E-02 G
                                                          Energy duplication
                           77.11 9.627E-01 + P 5.435E-01 1.73E-01 G
                          241.92-5.055E-03 % P 7.122E-01 2.11E-01 G

BI-212       8.6033E-01
                          727.17 8.603E-01  (P 4.722E-01 2.13E-01 G K
                         1620.56 4.900E-01 &   1.286E+00 3.80E-01 G
                          785.42 4.829E-01 % P 2.054E+00 5.94E-01 G

BI-214       5.0222E-01
                          609.32 4.785E-01  (P 8.053E-02 4.19E-02 G K
                         1764.51 5.710E-01  (P 1.333E-01 1.02E-01 G
                         1120.28 8.440E-01 + P 4.694E-01 2.15E-01 G

RA-224       8.1663E-01
                          241.00 8.166E-01 %(P 1.193E+00 3.66E-01 G

RA-226       1.0472E+00
                          185.99 1.047E+00  (  1.072E+00 3.35E-01 G

AC-228       7.4388E-01
                          911.07 6.841E-01 *(P 1.377E-01 7.71E-02 G K
                          968.90 8.918E-01  (P 3.170E-01 1.51E-01 G
                          338.40 6.732E-01  (P 2.869E-01 1.13E-01 G

TH-227      -6.6915E-02
                          236.00-6.692E-02 &(P 3.375E-01 1.00E-01 G K
                          256.25-8.767E-02 % P 4.495E-01 1.32E-01 G

PA-234      -6.5282E-03
                           98.44-6.528E-03 %(  1.597E-01 4.74E-02 G K
                          946.00-1.404E-02 %   2.408E-01 6.71E-02 G
                          131.28 7.235E-02 &   1.723E-01 5.21E-02 G
                           94.67-9.554E-02 %   3.053E-01 9.20E-02 G
                          883.24 3.389E-02 %   3.510E-01 9.81E-02 G
                          926.70 5.616E-02 %   4.035E-01 1.14E-01 G
```

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 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26 3.699E-02 &   3.196E-01 9.08E-02 G

TH-234       1.3586E+00
                           63.29 8.696E-01 %(P 1.989E+00 6.00E-01 G K
                           92.80 1.644E+00 *(P 1.548E+00 4.80E-01 G
                           92.38 1.767E+00 *(P 1.867E+00 5.75E-01 G

AM-241       2.7300E-02
                           59.54 2.730E-02 %(P 2.666E-01 7.94E-02 G
   ( - This peak used in the nuclide activity average.

   * - Peak is too wide, but only one peak in library.
   ! - Peak is part of a multiplet and this area went
       negative during deconvolution.
   ? - Peak is too narrow.
   @ - Peak is too wide at FW25M, but ok at FWHM.
   % - Peak fails sensitivity test.
   $ - Peak identified, but first peak of this nuclide
       failed one or more qualification tests.
   + - Peak activity higher than counting uncertainty range.
   - - Peak activity lower than counting uncertainty range.
   = - Peak outside analysis energy range.
   & - Calculated peak centroid is not close enough to the
       library energy centroid for positive identification.
   P - Peakbackground subtraction
   } - Peak is too close to another for the activity
       to be found directly.

   Nuclide Codes:                      Peak Codes:
   T - Thermal Neutron Activation      G - Gamma Ray
   F - Fast Neutron Activation         X - X-Ray
   I - Fission Product                 P - Positron Decay
   N - Naturally Occurring Isotope     S - Single-Escape
   P - Photon Reaction                 D - Double-Escape
   C - Charged Particle Reaction       K - Key Line
   M - No MDA Calculation              A - Not in Average
   R - Coincidence Corrected           C - Coincidence Peak
   H - Halflife limit exceeded

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
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***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	2.3258E-01	2.4469E-01	2.9130E-01	2.9163E-01	2.894E-01
K-40		1.2101E+01	1.2101E+01	1.6320E+00	1.7695E+00	
MN-54	#A	1.4723E-03	1.4852E-03	3.4643E-02	3.4643E-02	4.157E-02
CO-57	#B	6.3015E-03	6.3651E-03	3.9884E-02	3.9885E-02	4.413E-02
CO-60	#B	2.9556E-02	2.9598E-02	3.9467E-02	3.9503E-02	4.013E-02

Sr-85	#A	-1.2660E-02	-1.3201E-02	3.9153E-02	3.9160E-02	4.221E-02
Kr-85	#A	-3.1833E+02	-3.1834E+02	1.0206E+03	1.0208E+03	9.812E+02
Y-88	#B	1.3196E-02	1.3536E-02	3.5041E-02	3.5049E-02	3.941E-02
NB-94	#B	-2.9057E-03	-2.9057E-03	3.8800E-02	3.8800E-02	4.064E-02
Ag-108M	#B	1.9686E-02	1.9688E-02	3.9169E-02	3.9185E-02	4.318E-02
CD-109	#A	3.8128E-02	3.8357E-02	1.0874E+00	1.0874E+00	1.212E+00
SN-113	#B	9.4428E-03	9.6679E-03	5.4997E-02	5.4999E-02	6.108E-02
SB-125	#B	1.0508E-01	1.0536E-01	9.5022E-02	9.5208E-02	1.092E-01
I-131	#B	1.7735E-03	2.4849E-03	6.1164E-02	6.1164E-02	5.004E-02
CS-134	#B	-4.3208E-03	-4.3364E-03	1.3391E-01	1.3392E-01	1.086E-01
CS-137	#A	1.1897E-02	1.1900E-02	4.1137E-02	4.1143E-02	4.717E-02
CE-139	#A	-1.2034E-02	-1.2274E-02	4.2820E-02	4.2826E-02	4.558E-02
EU-152	#B	2.3311E-02	2.3324E-02	1.1783E-01	1.1784E-01	1.314E-01
EU-154	#B	8.2116E-03	8.2187E-03	8.8174E-02	8.8175E-02	9.868E-02
EU-155	#B	3.6503E-03	3.6557E-03	1.5493E-01	1.5493E-01	1.729E-01
HG-203	#B	-1.2348E-02	-1.3088E-02	4.5460E-02	4.5466E-02	4.793E-02
TL-208		2.0851E-01	2.0851E-01	6.9585E-02	7.0575E-02	
PB-212	#	5.3988E-01	5.3988E-01	1.1690E-01	1.2081E-01	9.877E-02
PB-214	#	4.1136E-01	4.1136E-01	1.1176E-01	1.1416E-01	9.473E-02
BI-212		8.6033E-01	8.6033E-01	6.3859E-01	6.4044E-01	
BI-214		5.0222E-01	5.0222E-01	1.3183E-01	1.3485E-01	
RA-224	#A	8.1663E-01	8.1663E-01	1.0966E+00	1.0976E+00	1.193E+00
RA-226	#A	1.0472E+00	1.0472E+00	1.0039E+00	1.0057E+00	1.072E+00
AC-228		7.4388E-01	7.4388E-01	1.9602E-01	2.0048E-01	
TH-227	#B	-6.6915E-02	-6.6915E-02	3.1739E-01	3.1741E-01	3.375E-01
PA-234	#B	-6.5282E-03	-6.5282E-03	1.4223E-01	1.4223E-01	1.597E-01
TH-234	#B	1.3586E+00	1.3586E+00	1.1100E+00	1.1126E+00	1.989E+00
AM-241	#A	2.7299E-02	2.7300E-02	2.3810E-01	2.3810E-01	2.665E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (276.6 to 1999.1 keV) 1.4415548E+01 pCi/gm
Total Decayed Activity (276.6 to 1999.1 keV) 1.4415548E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JPK

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 101F_13SEPT2006_0858.An1

Sample description
FSS-OOL-05-10-008-F

Spectrum Filename: C:\GammaVision\Spectra\101F_13SEPT2006_0858.An1

Acquisition information
Start time: 13-Sep-2006 08:58:28
Live time: 2000
Real time: 2002
Dead time: 0.10 %
Detector ID: 1

Detector system
Det 101- DSPE-633

Calibration
Filename: D1_1LSa.Clb
Detector 101 1.0 Liter Marinelli Sand

Energy Calibration
Created: 03-Sep-2004 08:50:48
Zero offset: 0.244 keV
Gain: 0.500 keV/channel
Quadratic: -2.493E-08 keV/channel^2

Efficiency Calibration
Created: 03-Sep-2004 08:52:26
Type: Polynomial
Uncertainty: 0.626 %
Coefficients: -0.321775 -5.816463 0.734234
-0.099357 0.006049 -0.000149

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.23keV)
Stop channel: 4000 (1999.11keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 1.8910E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.8910E+03) =
5.2882E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	09-Sep-2006 10:07:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	101_150K_28APR05.Pbc 01-May-2005 05:24:47
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 14 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.1400

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
74.76	176.	23.11	1.50	1.654E-02	70.83	3.520	2.503E+00	HG203
					74.81	9.600	7.912E-01	PB212
77.06	254.	15.92	1.50	1.720E-02	77.11	10.700	9.846E-01	PB214
					77.11	17.500	6.020E-01	PB212
77.06	257.	15.92	1.50	1.720E-02	77.11	10.700	9.846E-01	PB214
					77.11	17.500	6.108E-01	PB212
89.66	64.	37.89	1.02	1.956E-02				
93.16	104.	24.33	1.02	1.995E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
185.97	148.	20.58	1.72	1.858E-02	185.99	3.280	1.738E+00	RA226
238.77	480.	5.68	1.12	1.558E-02				
238.77	480.	5.68	1.12	1.558E-02	238.63	43.100	5.039E-01	PB212
241.80	82.	24.35	1.12	1.541E-02	241.00	3.900	PBC<MDA	RA224
246.37	45.	39.40	1.50	1.540E-02	241.92	7.470	PBC<MDA	PB214
270.06	60.	36.09	1.25	1.401E-02				
295.12	192.	11.01	1.09	1.292E-02				
295.12	192.	11.01	1.09	1.292E-02	295.22	19.200	5.480E-01	PB214
300.60	56.	33.24	1.03	1.270E-02				
338.25	122.	19.40	1.21	1.135E-02	338.40	12.010	6.281E-01	AC228
351.94	253.	10.02	1.23	1.093E-02				
351.94	253.	10.02	1.23	1.093E-02	351.99	37.100	4.426E-01	PB214
463.38	45.	36.31	1.44	8.344E-03				
463.38	45.	36.31	1.44	8.344E-03	463.51	10.000	3.741E-01	SB125
511.15	89.	19.41	1.81	7.584E-03	510.72	22.500	3.045E-01	TL208
					513.99	0.004	1.930E+03	Kr85
					514.00	99.270	8.840E-02	Sr85
583.00	177.	10.80	1.24	6.686E-03	583.14	86.000	2.172E-01	TL208

609.25	192.	12.37	1.54	6.413E-03	609.32	46.090	4.615E-01	BI214
727.69	42.	26.64	1.13	5.439E-03	727.17	11.800	4.598E-01	BI212
794.72	25.	32.67	1.50	5.016E-03	795.76	85.400	4.105E-02	CS134
910.94	98.	12.26	1.81	4.447E-03	911.07	29.000	5.350E-01	AC228
968.94	50.	25.77	1.17	4.212E-03	968.90	17.460	4.808E-01	AC228
1120.72	64.	24.32	1.38	3.710E-03	1120.28	15.040	8.171E-01	BI214

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
1460.59	396.	5.16	1.68	2.943E-03	1460.75	10.700	8.946E+00	K40
1764.58	19.	29.60	2.11	2.481E-03	1764.51	15.920	3.380E-01	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
178.91	89.89	261.	64.	0.032	113.67	1.015	PB-214	lD
477.24	238.62	131.	480.	0.240	17.03	1.122	PB-212	D
483.31	241.65	160.	82.	0.041	73.06	1.124	PB-214	D
539.84	270.06	166.	60.	0.030	108.27	1.247	AC-228	
600.96	300.60	119.	56.	0.028	91.06	1.030	PB-212	s

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-212	149.09	74.76	790.	176.	0.088	69.32	1.499
PB-214	153.79	77.11	715.	254.	0.127	47.77	1.499D
PB-212	153.79	77.11	711.	257.	0.129	47.77	1.499D
TH-234	185.33	92.87	669.	123.	0.062	85.30	1.499s
TH-234	185.31	92.86	643.	128.	0.064	84.03	1.499s
RA-226	371.59	185.97	301.	148.	0.074	61.74	1.720s
PB-212	477.17	238.73	329.	400.	0.200	23.98	1.499
RA-224	483.32	241.81	355.	69.	0.035	119.74	1.499
PB-214	492.45	246.37	142.	45.	0.023	118.21	1.499
PB-214	590.28	295.27	125.	158.	0.079	37.73	1.499
AC-228	676.28	338.25	148.	120.	0.060	58.19	1.210
PB-214	703.74	351.97	80.	250.	0.125	24.07	1.499
TL-208	1022.23	511.15	83.	73.	0.036	58.23	1.813s
TL-208	1166.02	583.00	63.	175.	0.087	32.40	1.241s
BI-214	1218.54	609.25	94.	191.	0.095	37.11	1.541
BI-212	1455.53	727.69	33.	41.	0.021	79.92	1.127
CS-134	1589.67	794.72	21.	25.	0.012	98.00	1.502s
AC-228	1822.23	910.94	21.	97.	0.048	36.77	1.810
AC-228	1938.38	968.98	32.	42.	0.021	71.79	1.616
BI-214	2242.04	1120.72	41.	64.	0.032	72.95	1.377s
K-40	2922.19	1460.59	8.	394.	0.197	15.47	1.678
BI-214	3530.60	1764.58	7.	19.	0.009	88.81	2.106

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	Peak MDA Value pCi/gm	COMMENTS
BE-7		2.6988E-02					
			477.56	2.699E-02	%(	3.135E-01 8.91E-02	G
K-40		8.9456E+00					
			1460.75	8.946E+00	(P	3.584E-01 4.64E-01	G
MN-54		-2.4090E-03					
			834.81	-2.409E-03	%(P	4.692E-02 1.30E-02	G
CO-57		-2.8789E-03					
			122.07	-2.879E-03	%(	4.373E-02 1.30E-02	G K
			136.43	1.182E-01	&	3.491E-01 1.05E-01	G
CO-60		3.2583E-03					
			1332.51	3.258E-03	%(P	3.850E-02 1.02E-02	G K
			1173.23	-2.799E-03	& P	5.672E-02 1.57E-02	G K
Sr-85		7.7530E-04					
			514.00	7.753E-04	%(	4.093E-02 1.16E-02	G
Kr-85		-2.2271E+00					
			513.99	-2.227E+00	%(P	9.343E+02 2.64E+02	G
Y-88		0.0000E+00					
			1836.01	0.000E+00	%(	5.115E-02 1.30E-02	G K
			898.02	-2.477E-03	% P	4.431E-02 1.21E-02	G
NB-94		-3.0186E-03					
			871.10	-3.019E-03	&(P	3.454E-02 9.41E-03	G K
			702.50	-2.864E-03	% P	3.746E-02 1.05E-02	G K
Ag-108M		7.9730E-03					
			722.95	7.973E-03	&(	4.292E-02 1.23E-02	G K
			614.37	8.227E-03	& P	3.920E-02 1.13E-02	G
			433.93	-1.639E-03	&	4.373E-02 1.26E-02	G
CD-109		-5.0869E-02					
			88.04	-5.087E-02	&(P	1.206E+00 3.58E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SN-113	0.0000E+00						
		391.71	0.000E+00	%(	6.795E-02	1.97E-02	G K
		255.04	-1.032E-01	% P	1.690E+00	4.95E-01	G
SB-125	3.6503E-03						
		427.95	3.650E-03	&(P	1.141E-01	3.25E-02	G K
		600.77	5.492E-02	% P	2.026E-01	5.93E-02	G
		636.15	-2.952E-03	% P	4.089E-01	1.15E-01	G
		463.51	2.595E-01	% P	3.529E-01	1.10E-01	G
		176.29	1.332E-01	& P	5.702E-01	1.70E-01	G
I-131	1.1790E-02						
		364.48	1.179E-02	&(	6.004E-02	1.77E-02	G K
		636.97	2.645E-01	%	6.084E-01	1.83E-01	G
		284.29	-1.438E-01	&	8.199E-01	2.42E-01	G
CS-134	8.4997E-03						
		604.66	-1.998E-02	&(P	5.765E-02	1.72E-02	G K
		795.76	4.105E-02	*(P	4.039E-02	1.36E-02	G
		569.29	5.788E-02	% P	2.004E-01	5.85E-02	G
		801.84	-3.769E-02	&	5.660E-01	1.60E-01	G
CS-137	1.0332E-02						
		661.62	1.033E-02	%(P	4.100E-02	1.18E-02	G
CE-139	-1.8654E-04						
		165.85	-1.865E-04	&(P	4.528E-02	1.34E-02	G
EU-152	-4.1977E-03						
		121.78	-4.198E-03	%(P	1.255E-01	3.72E-02	G K
		344.30	-1.819E-03	% P	1.455E-01	4.21E-02	G
		1408.08	6.793E-02	% P	1.360E-01	4.20E-02	G
		964.00	1.830E-01	% P	3.667E-01	1.11E-01	G
		1112.07	-1.529E-03	% P	4.472E-01	1.24E-01	G
		778.90	1.041E-02	% P	3.859E-01	1.09E-01	G
EU-154	-1.7242E-02						
		123.10	-1.724E-02	%(P	9.862E-02	2.95E-02	G K
		1274.80	-1.537E-02	% P	1.740E-01	4.88E-02	G
		723.30	-9.692E-02	& P	2.960E-01	8.78E-02	G
		1004.80	7.897E-02	& P	2.578E-01	7.54E-02	G
EU-155	8.6430E-03						
		86.45	8.643E-03	&(	1.320E-01	3.92E-02	G K
		105.31	2.206E-02	&	1.798E-01	5.36E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
HG-203	-2.4669E-03						
		279.17	-2.467E-03	&(	4.498E-02	1.32E-02	G K
		72.87	-4.879E-01	% P	1.166E+00	3.52E-01	G
		70.83	-1.290E+00	&	1.950E+00	5.96E-01	G
		82.50	-2.986E-01	&	1.793E+00	5.34E-01	G
TL-208	2.1720E-01						
		583.14	2.172E-01	@(P	4.945E-02	2.38E-02	G
		510.72	3.045E-01	+ P	1.892E-01	7.22E-02	G
PB-212	4.2538E-01						
		238.63	4.254E-01	(P	9.291E-02	3.45E-02	G K
							Energy duplication
		77.11	6.108E-01	+	3.014E-01	9.73E-02	G
		74.81	7.912E-01	& P	6.016E-01	1.88E-01	G
PB-214	4.4575E-01						
		351.99	4.403E-01	(P	7.826E-02	3.56E-02	G K
		295.22	4.562E-01	(P	1.576E-01	5.80E-02	G
							Energy duplication
		77.11	9.846E-01	+ P	4.942E-01	1.59E-01	G
		241.92	2.815E-01	- P	3.617E-01	1.13E-01	G
BI-212	4.5978E-01						
		727.17	4.598E-01	(P	3.265E-01	1.25E-01	G K
		1620.56	1.715E-01	&	1.520E+00	4.03E-01	G
		785.42	2.124E-01	% P	1.866E+00	5.22E-01	G
BI-214	4.6155E-01						
		609.32	4.615E-01	(P	1.159E-01	5.74E-02	G K
		1764.51	3.380E-01	- P	2.704E-01	1.02E-01	G
		1120.28	8.171E-01	+ P	4.176E-01	2.00E-01	G
RA-224	8.2018E-01						
		241.00	8.202E-01	(P	1.073E+00	3.31E-01	G
RA-226	1.7376E+00						
		185.99	1.738E+00	*(	9.794E-01	3.58E-01	G
AC-228	5.6226E-01						
		911.07	5.350E-01	(P	1.347E-01	6.68E-02	G K
		968.90	4.103E-01	- P	2.827E-01	9.99E-02	G
		338.40	6.281E-01	(P	3.116E-01	1.24E-01	G
TH-227	-1.0908E-01						
		236.00	-1.091E-01	&(P	3.974E-01	1.19E-01	G K
		256.25	1.377E-02	% P	5.059E-01	1.48E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
PA-234	9.5647E-03						
		98.44	9.565E-03	%(	1.494E-01	4.43E-02	G K
		946.00	6.969E-03	%	2.539E-01	7.06E-02	G
		131.28	-1.763E-02	%	1.921E-01	5.72E-02	G
		94.67	-1.017E-01	%	2.857E-01	8.62E-02	G
		883.24	-1.594E-02	&	3.540E-01	9.78E-02	G
		926.70	1.159E-01	%	3.808E-01	1.11E-01	G
		569.26	9.002E-02	%	2.944E-01	8.65E-02	G
TH-234	1.1181E+00						
		63.29	4.025E-01	%(P	1.898E+00	5.66E-01	G K
		92.80	1.529E+00	(P	1.447E+00	4.49E-01	G
		92.38	1.724E+00	(P	1.726E+00	5.33E-01	G
AM-241	-6.0710E-04						
		59.54	-6.071E-04	%(P	2.516E-01	7.44E-02	G

(- This peak used in the nuclide activity average.

* - Peak is too wide, but only one peak in library.
! - Peak is part of a multiplet and this area went negative during deconvolution.
? - Peak is too narrow.
@ - Peak is too wide at FW25M, but ok at FWHM.
% - Peak fails sensitivity test.
$ - Peak identified, but first peak of this nuclide failed one or more qualification tests.
+ - Peak activity higher than counting uncertainty range.
- - Peak activity lower than counting uncertainty range.
= - Peak outside analysis energy range.
& - Calculated peak centroid is not close enough to the library energy centroid for positive identification.
P - Peakbackground subtraction
} - Peak is too close to another for the activity to be found directly.

Nuclide Codes:	Peak Codes:
T - Thermal Neutron Activation	G - Gamma Ray
F - Fast Neutron Activation	X - X-Ray
I - Fission Product	P - Positron Decay
N - Naturally Occurring Isotope	S - Single-Escape
P - Photon Reaction	D - Double-Escape
C - Charged Particle Reaction	K - Key Line
M - No MDA Calculation	A - Not in Average
R - Coincidence Corrected	C - Coincidence Peak
H - Halflife limit exceeded	

- -

***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	2.5638E-02	2.6988E-02	2.6728E-01	2.6728E-01	2.978E-01
K-40		8.9456E+00	8.9456E+00	1.3916E+00	1.4806E+00	
MN-54	#A	-2.3879E-03	-2.4090E-03	6.6625E-02	6.6625E-02	4.651E-02
CO-57	#B	-2.8499E-03	-2.8789E-03	3.8964E-02	3.8964E-02	4.329E-02
CO-60	#B	3.2537E-03	3.2583E-03	3.0548E-02	3.0549E-02	3.845E-02
Sr-85	#A	7.4322E-04	7.7530E-04	3.4906E-02	3.4906E-02	3.924E-02
Kr-85	#A	-2.2271E+00	-2.2271E+00	9.4175E+02	9.4175E+02	9.342E+02
Y-88	#B	0.0000E+00	0.0000E+00	3.8954E-02	3.8955E-02	4.985E-02
NB-94	#B	-3.0186E-03	-3.0186E-03	3.2372E-02	3.2372E-02	3.454E-02
Ag-108M	#B	7.9725E-03	7.9730E-03	3.6942E-02	3.6945E-02	4.291E-02
CD-109	#A	-5.0563E-02	-5.0869E-02	1.2892E+00	1.2892E+00	1.199E+00
SN-113	#B	0.0000E+00	0.0000E+00	5.9008E-02	5.9008E-02	6.636E-02
SB-125	#B	3.6405E-03	3.6503E-03	9.7611E-02	9.7611E-02	1.138E-01
I-131	#B	8.3855E-03	1.1790E-02	5.2961E-02	5.2966E-02	4.270E-02
CS-134	#B	8.4688E-03	8.4997E-03	8.4712E-03	8.4848E-03	5.744E-02
CS-137	#A	1.0329E-02	1.0332E-02	3.5493E-02	3.5498E-02	4.099E-02
CE-139	#A	-1.8286E-04	-1.8654E-04	3.8423E-01	3.8423E-01	4.438E-02
EU-152	#B	-4.1953E-03	-4.1977E-03	1.7292E-01	1.7292E-01	1.254E-01
EU-154	#B	-1.7227E-02	-1.7242E-02	9.6543E-02	9.6547E-02	9.853E-02
EU-155	#B	8.6300E-03	8.6430E-03	1.1770E-01	1.1770E-01	1.318E-01
HG-203	#B	-2.3260E-03	-2.4669E-03	3.9461E-02	3.9461E-02	4.241E-02
TL-208	#	2.1720E-01	2.1720E-01	7.1336E-02	7.2384E-02	
PB-212	#	4.2538E-01	4.2538E-01	1.0359E-01	1.0634E-01	9.291E-02
PB-214	#	4.4575E-01	4.4575E-01	1.0076E-01	1.0386E-01	7.826E-02
BI-212		4.5978E-01	4.5978E-01	3.7349E-01	3.7440E-01	
BI-214		4.6155E-01	4.6155E-01	1.7226E-01	1.7423E-01	
RA-224	#A	8.2018E-01	8.2018E-01	9.9224E-01	9.9333E-01	1.073E+00
RA-226	#	1.7376E+00	1.7376E+00	1.0728E+00	1.0773E+00	
AC-228		5.6226E-01	5.6226E-01	1.9710E-01	1.9965E-01	
TH-227	#B	-1.0908E-01	-1.0908E-01	3.6890E-01	3.6895E-01	3.974E-01
PA-234	#B	9.5647E-03	9.5647E-03	1.3299E-01	1.3299E-01	1.494E-01
TH-234	#B	1.1181E+00	1.1181E+00	9.8500E-01	9.8695E-01	1.898E+00
AM-241	#A	-6.0709E-04	-6.0710E-04	4.1175E-01	4.1175E-01	2.516E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (269.6 to 1999.1 keV) 1.2383985E+01 pCi/gm
Total Decayed Activity (269.6 to 1999.1 keV) 1.2383993E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JPK

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 102F_9SEP2006_1121.An1

Sample description
FSS-OOL-05-10-011-F-A

Spectrum Filename: C:\GammaVision\Spectra\102F_9SEP2006_1121.An1

Acquisition information
Start time: 09-Sep-2006 11:21:29
Live time: 2000
Real time: 2011
Dead time: 0.54 %
Detector ID: 3

Detector system
Det 102 - DSPP-468

Calibration
Filename: D2_1LSa.Clb
DET 102 1 Liter Sand Geometry

Energy Calibration
Created: 15-Jan-2005 03:09:29
Zero offset: 0.220 keV
Gain: 0.500 keV/channel
Quadratic: -6.435E-08 keV/channel^2

Efficiency Calibration
Created: 15-Jan-2005 06:48:10
Type: Polynomial
Uncertainty: 0.497 %
Coefficients: -0.294180 -5.980622 0.744607
-0.096737 0.005214 -0.000120

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.22keV)
Stop channel: 4000 (1999.02keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 1.3900E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.3900E+03) =
7.1942E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	09-Sep-2006 10:50:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	102_150K_28APR05.Pbc 01-May-2005 05:27:47
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 9 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.5566

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
76.64	134.	24.47	1.05	9.403E-03				
76.64	134.	24.47	1.05	9.403E-03	77.11	10.700	1.271E+00	PB214
					77.11	17.500	7.773E-01	PB212
185.92	54.	29.42	1.69	1.627E-02				
185.92	54.	29.42	1.69	1.627E-02	185.99	3.280	PBC<MDA	RA226
238.96	152.	10.68	1.21	1.379E-02	238.63	43.100	2.481E-01	PB212
242.68	61.	24.16	1.22	1.362E-02	241.00	3.900	PBC<MDA	RA224
					241.92	7.470	5.788E-01	PB214
295.78	133.	17.48	1.31	1.144E-02	295.22	19.200	5.887E-01	PB214
352.47	237.	9.02	1.32	9.666E-03	351.99	37.100	6.412E-01	PB214
511.44	32.	29.62	1.50	6.695E-03	510.72	22.500	2.034E-01	TL208
583.88	65.	17.90	1.50	5.883E-03	583.14	86.000	1.240E-01	TL208
610.14	155.	11.26	1.27	5.642E-03	604.66	97.600	2.710E-01	CS134
					609.32	46.090	5.780E-01	BI214
1121.64	62.	16.71	0.88	3.280E-03	1120.28	15.040	1.217E+00	BI214
1462.86	131.	8.93	2.02	2.618E-03				
1767.15	21.	21.82	1.17	2.222E-03				

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
2926.64	1462.86	3.	130.	0.065	27.03	2.019	K-40	M
3535.76	1767.15	0.	21.	0.010	65.47	1.166	XE-138	s

s - Peak fails shape tests.

D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.
M - Peak is close to a library peak.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-214	153.80	77.11	435.	100.	0.050	93.45	1.500D
PB-212	153.80	77.11	435.	100.	0.050	93.45	1.500D
RA-226	371.63	186.01	138.	44.	0.022	109.04	1.500s
PB-212	477.60	238.99	184.	119.	0.059	55.83	1.500
RA-224	483.96	242.16	167.	74.	0.037	80.18	1.500
PB-214	483.97	242.17	165.	74.	0.037	81.94	1.500
PB-214	591.21	295.78	70.	111.	0.055	42.94	1.500
PB-214	704.54	352.43	48.	209.	0.104	25.02	1.500
TL-208	1022.66	511.44	28.	32.	0.016	88.86	1.500s
TL-208	1167.79	583.98	21.	51.	0.026	55.89	1.499
BI-214	1220.13	610.14	39.	155.	0.077	33.78	1.272
BI-214	2243.67	1121.64	10.	62.	0.031	50.14	0.883s

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

Nuclide Name	Nuclide Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	MDA Value pCi/gm	COMMENTS
BE-7		3.2367E-02					
			477.56	3.237E-02	&(	3.351E-01 9.32E-02	G
K-40		4.5044E-02					
			1460.75	4.504E-02	%(P	2.968E-01 7.19E-02	G
MN-54		-6.0495E-03					
			834.81	-6.050E-03	&(P	5.076E-02 1.39E-02	G
CO-57		1.0338E-03					
			122.07	1.034E-03	%(	4.698E-02 1.37E-02	G K
			136.43	2.095E-02	%	3.771E-01 1.11E-01	G
CO-60		-2.5626E-03					
			1332.51	-2.563E-03	&(P	5.788E-02 1.49E-02	G K
			1173.23	-7.409E-03	%	5.932E-02 1.62E-02	G K

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
Sr-85	-1.8119E-03						
		514.00	-1.812E-03	&(	4.613E-02	1.29E-02	G
Kr-85	-4.1942E+01						
		513.99	-4.194E+01	&(	1.065E+03	2.98E+02	G
Y-88	-2.9895E-05						
		1836.01	-2.990E-05	%(P	3.357E-02	4.56E-03	G K
		898.02	-2.271E-03	% P	6.012E-02	1.59E-02	G
NB-94	-5.8867E-03						
		871.10	-5.887E-03	%(	4.165E-02	1.13E-02	G K
		702.50	4.038E-03	%	4.177E-02	1.14E-02	G K
Ag-108M	-1.5251E-03						
		722.95	-1.525E-03	&(	4.297E-02	1.14E-02	G K
		614.37	-4.041E-02	& P	7.736E-02	2.36E-02	G
		433.93	0.000E+00	&	4.438E-02	1.23E-02	G
CD-109	-2.4947E-01						
		88.04	-2.495E-01	%(P	2.232E+00	6.63E-01	G
SN-113	5.2400E-03						
		391.71	5.240E-03	%(	6.141E-02	1.75E-02	G K
		255.04	-2.855E-01	&	1.676E+00	4.90E-01	G
SB-125	3.9479E-03						
		427.95	3.948E-03	%(P	1.044E-01	2.83E-02	G K
		600.77	3.277E-03	% P	2.229E-01	6.02E-02	G
		636.15	-6.022E-02	& P	3.689E-01	1.03E-01	G
		463.51	-2.042E-02	% P	3.686E-01	9.83E-02	G
		176.29	4.125E-02	& P	4.443E-01	1.28E-01	G
I-131	8.7238E-03						
		364.48	8.724E-03	&(	4.178E-02	1.21E-02	G K
		636.97	0.000E+00	&	3.671E-01	9.11E-02	G
		284.29	9.674E-02	&	5.670E-01	1.65E-01	G
CS-134	-1.5280E-03						
		604.66	-1.528E-03	%(	4.326E-02	1.18E-02	G K
		795.76	9.299E-03	%	4.350E-02	1.21E-02	G
		569.29	-8.661E-02	%	3.144E-01	9.19E-02	G
		801.84	7.612E-02	% P	4.572E-01	1.26E-01	G
CS-137	1.4666E-03						
		661.62	1.467E-03	%(	4.495E-02	1.20E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CE-139	-1.0720E-03						
		165.85	-1.072E-03	&(P	5.332E-02	1.56E-02	G
EU-152	6.2165E-04						
		121.78	6.217E-04	%(P	1.374E-01	4.00E-02	G K
		344.30	-1.961E-02	%	1.326E-01	3.82E-02	G
		1408.08	6.506E-02	%	2.068E-01	5.90E-02	G
		964.00	-6.725E-02	% P	4.567E-01	1.28E-01	G
		1112.07	0.000E+00	%	5.759E-01	1.57E-01	G
		778.90	9.167E-03	& P	3.217E-01	8.47E-02	G
EU-154	-9.0817E-04						
		123.10	-9.082E-04	&(P	1.032E-01	3.02E-02	G K
		1274.80	2.949E-02	%	1.493E-01	4.11E-02	G
		723.30	-4.021E-03	& P	1.948E-01	5.04E-02	G
		1004.80	0.000E+00	&	4.505E-01	1.24E-01	G
EU-155	-4.1803E-03						
		86.45	-4.180E-03	&(P	2.561E-01	7.54E-02	G K
		105.31	-7.787E-03	&	1.732E-01	5.04E-02	G
HG-203	-5.3855E-03						
		279.17	-5.385E-03	&(P	4.318E-02	1.25E-02	G K
		72.87	-1.685E-01	&	1.685E+00	4.99E-01	G
		70.83	-1.309E+00	&	3.626E+00	1.09E+00	G
		82.50	-4.354E-01	%	3.883E+00	1.15E+00	G
TL-208	9.7945E-02						
		583.14	9.794E-02	(P	4.579E-02	1.84E-02	G
		510.72	2.034E-01	+	1.761E-01	6.02E-02	G
PB-212	1.9374E-01						
		238.63	1.937E-01	(	1.078E-01	3.61E-02	G K
							Energy duplication
		77.11	5.819E-01	+	5.814E-01	1.81E-01	G
		74.81	3.936E-01	& P	1.215E+00	3.65E-01	G
PB-214	5.3918E-01						
		351.99	5.651E-01	(P	9.463E-02	4.72E-02	G K
		295.22	4.891E-01	(	1.845E-01	7.00E-02	G
							Energy duplication
		77.11	9.518E-01	+	9.510E-01	2.96E-01	G
		241.92	7.007E-01	&	5.961E-01	1.91E-01	G
BI-212	6.9985E-02						
		727.17	6.998E-02	%(	3.632E-01	1.02E-01	G K
		1620.56	-4.949E-02	% P	1.087E+00	1.47E-01	G
		785.42	-2.902E-01	% P	2.431E+00	6.71E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
BI-214	5.7799E-01						
		609.32	5.780E-01	(	1.191E-01	6.52E-02	G K
		1764.51	-2.378E-03	% P	4.602E-01	1.17E-01	G
		1120.28	1.217E+00	+	3.464E-01	2.04E-01	G
RA-224	1.3517E+00						
		241.00	1.352E+00	&(P	1.144E+00	3.67E-01	G
RA-226	8.0876E-01						
		185.99	8.088E-01	(P	1.046E+00	3.23E-01	G
AC-228	-2.4331E-02						
		911.07	-2.433E-02	%(P	1.888E-01	5.18E-02	G K
		968.90	1.907E-03	% P	3.202E-01	8.50E-02	G
		338.40	2.058E-01	%	3.193E-01	9.90E-02	G
TH-227	-1.0571E-01						
		236.00	-1.057E-01	&(P	4.258E-01	1.27E-01	G K
		256.25	-2.338E-02	&	5.467E-01	1.58E-01	G
PA-234	4.4054E-02						
		98.44	4.405E-02	%(	2.463E-01	7.33E-02	G K
		946.00	-3.757E-02	%	2.474E-01	6.82E-02	G
		131.28	5.574E-04	%	1.995E-01	5.82E-02	G
		94.67	-1.864E-01	%	4.875E-01	1.47E-01	G
		883.24	9.439E-03	%	3.702E-01	9.68E-02	G
		926.70	3.585E-04	%	3.849E-01	9.80E-02	G
		569.26	-1.235E-01	%	4.615E-01	1.35E-01	G
TH-234	9.6535E-01						
		63.29	9.653E-01	%(P	4.695E+00	1.40E+00	G K
		92.80	1.456E+00	%	2.360E+00	7.21E-01	G
		92.38	1.668E+00	% P	2.809E+00	8.57E-01	G
AM-241	1.1634E-01						
		59.54	1.163E-01	%(	6.951E-01	2.07E-01	G

(- This peak used in the nuclide activity average.

* - Peak is too wide, but only one peak in library.
! - Peak is part of a multiplet and this area went negative during deconvolution.
? - Peak is too narrow.
@ - Peak is too wide at FW25M, but ok at FWHM.
% - Peak fails sensitivity test.
$ - Peak identified, but first peak of this nuclide failed one or more qualification tests.

+ - Peak activity higher than counting uncertainty range.
- - Peak activity lower than counting uncertainty range.
= - Peak outside analysis energy range.
& - Calculated peak centroid is not close enough to the library energy centroid for positive identification.
P - Peakbackground subtraction
} - Peak is too close to another for the activity to be found directly.

Nuclide Codes:	Peak Codes:
T - Thermal Neutron Activation	G - Gamma Ray
F - Fast Neutron Activation	X - X-Ray
I - Fission Product	P - Positron Decay
N - Naturally Occurring Isotope	S - Single-Escape
P - Photon Reaction	D - Double-Escape
C - Charged Particle Reaction	K - Key Line
M - No MDA Calculation	A - Not in Average
R - Coincidence Corrected	C - Coincidence Peak
H - Halflife limit exceeded	

- -

***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	3.2358E-02	3.2367E-02	2.7950E-01	2.7951E-01	3.350E-01
K-40	A	4.5044E-02	4.5044E-02	2.1567E-01	2.1568E-01	2.968E-01
MN-54	#A	-6.0492E-03	-6.0495E-03	4.9053E-02	4.9054E-02	5.076E-02
CO-57	#B	1.0337E-03	1.0338E-03	4.1179E-02	4.1180E-02	4.697E-02
CO-60	#B	-2.5625E-03	-2.5626E-03	5.5263E-02	5.5263E-02	5.788E-02
Sr-85	#A	-1.8115E-03	-1.8119E-03	3.8680E-02	3.8680E-02	4.612E-02
Kr-85	#A	-4.1942E+01	-4.1942E+01	8.9278E+02	8.9279E+02	1.065E+03
Y-88	#B	-2.9891E-05	-2.9895E-05	1.7937E-04	1.7938E-04	3.357E-02
NB-94	#B	-5.8867E-03	-5.8867E-03	3.3952E-02	3.3954E-02	4.165E-02
Ag-108M	#B	-1.5251E-03	-1.5251E-03	3.4077E-02	3.4077E-02	4.297E-02
CD-109	#A	-2.4946E-01	-2.4947E-01	2.5498E+00	2.5498E+00	2.232E+00
SN-113	#B	5.2393E-03	5.2400E-03	5.2409E-02	5.2410E-02	6.141E-02
SB-125	#B	3.9479E-03	3.9479E-03	8.4861E-02	8.4862E-02	1.044E-01
I-131	#B	8.7074E-03	8.7238E-03	3.6289E-02	3.6293E-02	4.170E-02
CS-134	#B	-1.5279E-03	-1.5280E-03	3.5409E-02	3.5409E-02	4.326E-02
CS-137	#A	1.4666E-03	1.4666E-03	3.5906E-02	3.5906E-02	4.495E-02
CE-139	#A	-1.0719E-03	-1.0720E-03	8.5231E-02	8.5232E-02	5.331E-02
EU-152	#B	6.2165E-04	6.2165E-04	1.2013E-01	1.2013E-01	1.374E-01
EU-154	#B	-9.0817E-04	-9.0817E-04	1.7636E-01	1.7636E-01	1.032E-01
EU-155	#B	-4.1803E-03	-4.1803E-03	5.8518E-01	5.8518E-01	2.560E-01
HG-203	#B	-5.3837E-03	-5.3855E-03	3.8780E-02	3.8781E-02	4.316E-02
TL-208	#	9.7945E-02	9.7945E-02	5.5173E-02	5.5446E-02	4.579E-02
PB-212	#	1.9374E-01	1.9374E-01	1.0817E-01	1.0871E-01	1.078E-01
PB-214	#	5.3918E-01	5.3918E-01	1.3404E-01	1.3741E-01	9.463E-02
BI-212	#B	6.9985E-02	6.9985E-02	3.0650E-01	3.0653E-01	3.632E-01

BI-214	5.7799E-01	5.7799E-01	1.9523E-01	1.9790E-01

RA-224	#	1.3517E+00	1.3517E+00	1.1007E+00	1.1034E+00	1.144E+00
RA-226	#A	8.0876E-01	8.0876E-01	9.7049E-01	9.7155E-01	1.046E+00
AC-228	#B	-2.4331E-02	-2.4331E-02	1.8262E-01	1.8263E-01	1.888E-01
TH-227	#B	-1.0571E-01	-1.0571E-01	3.9279E-01	3.9284E-01	4.258E-01
PA-234	#B	4.4054E-02	4.4054E-02	2.2005E-01	2.2006E-01	2.463E-01
TH-234	#B	9.6535E-01	9.6535E-01	4.2004E+00	4.2007E+00	4.695E+00
AM-241	#A	1.1634E-01	1.1634E-01	6.2030E-01	6.2033E-01	6.951E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (1766.8 to 1999.0 keV) 5.7799488E-01 pCi/gm
Total Decayed Activity (1766.8 to 1999.0 keV) 5.7799488E-01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JJM

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 102F_9SEP2006_1200.An1

Sample description
FSS-OOL-05-10-003-F WET

Spectrum Filename: C:\GammaVision\Spectra\102F_9SEP2006_1200.An1

Acquisition information
Start time: 09-Sep-2006 12:00:58
Live time: 2000
Real time: 2019
Dead time: 0.94 %
Detector ID: 3

Detector system
Det 102 - DSPP-468

Calibration
Filename: D2_1LSa.Clb
DET 102 1 Liter Sand Geometry

Energy Calibration
Created: 15-Jan-2005 03:09:29
Zero offset: 0.220 keV
Gain: 0.500 keV/channel
Quadratic: -6.435E-08 keV/channel^2

Efficiency Calibration
Created: 15-Jan-2005 06:48:10
Type: Polynomial
Uncertainty: 0.497 %
Coefficients: -0.294180 -5.980622 0.744607
-0.096737 0.005214 -0.000120

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.22keV)
Stop channel: 4000 (1999.02keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 1.9660E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.9660E+03) =
5.0865E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	09-Sep-2006 08:25:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	102_150K_28APR05.Pbc 01-May-2005 05:27:47
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 14 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.8030

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
77.24	174.	24.68	1.50	9.541E-03	77.11	10.700	1.171E+00	PB214
					77.11	17.500	7.160E-01	PB212
					82.50	2.240	4.852E+00	HG203
77.24	174.	24.68	1.50	9.541E-03	77.11	10.700	1.171E+00	PB214
					77.11	17.500	7.160E-01	PB212
					82.50	2.240	4.852E+00	HG203
88.08	99.	39.58	1.07	1.236E-02	88.04	3.790	PBC<MDA	CD109
186.44	71.	38.75	1.50	1.627E-02	185.99	3.280	PBC<MDA	RA226
239.00	562.	5.22	1.22	1.379E-02	238.63	43.100	6.490E-01	PB212
242.08	83.	28.85	1.22	1.365E-02	241.00	3.900	PBC<MDA	RA224
					241.92	7.470	5.601E-01	PB214
270.72	65.	31.77	0.84	1.241E-02				
295.74	137.	12.42	1.26	1.145E-02	295.22	19.200	4.276E-01	PB214
338.97	120.	17.08	1.32	1.004E-02	338.40	12.010	6.855E-01	AC228
352.47	235.	11.73	1.19	9.666E-03	351.99	37.100	4.491E-01	PB214
463.71	32.	35.42	0.85	7.362E-03	463.51	10.000	PBC<MDA	SB125
511.56	112.	15.91	1.59	6.684E-03	510.72	22.500	5.106E-01	TL208
583.89	158.	10.36	1.82	5.883E-03	583.14	86.000	2.141E-01	TL208
610.32	151.	10.42	1.44	5.641E-03	609.32	46.090	3.997E-01	BI214
728.57	58.	24.88	0.99	4.786E-03	727.17	11.800	7.023E-01	BI212
912.35	112.	14.71	1.25	3.917E-03	911.07	29.000	6.755E-01	AC228
965.20	20.	38.96	1.72	3.730E-03	964.00	14.580	PBC<MDA	EU152
1462.87	488.	4.65	2.11	2.618E-03	1460.75	10.700	1.195E+01	K40

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
477.62	238.92	149.	562.	0.281	15.66	1.215	PB-212	D
483.79	242.00	246.	83.	0.042	86.54	1.217	PB-214	D
541.08	270.72	153.	65.	0.033	95.30	0.844	AC-228	
1930.66	965.23	19.	20.	0.010	114.61	1.715	AC-228	D
1940.95	970.40	16.	69.	0.035	43.48	1.719	AC-228	lD

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-214	153.80	77.11	834.	174.	0.087	74.04	1.500D
PB-212	153.80	77.11	834.	174.	0.087	74.04	1.500D
RA-226	372.49	186.44	392.	71.	0.035	116.26	1.500s
PB-212	477.52	238.94	349.	488.	0.244	21.17	1.500
PB-214	591.20	295.77	152.	139.	0.069	45.46	1.500s
AC-228	677.63	338.97	104.	120.	0.060	51.24	1.318s
PB-214	704.66	352.49	100.	205.	0.102	29.42	1.500
SB-125	927.23	463.74	53.	33.	0.017	100.98	1.500s
TL-208	1022.89	511.56	62.	112.	0.056	47.72	1.586s
TL-208	1167.62	583.89	41.	158.	0.079	31.07	1.816s
BI-214	1220.49	610.32	41.	151.	0.076	31.26	1.438
BI-212	1457.10	728.57	39.	58.	0.029	74.63	0.991s
AC-228	1824.85	912.35	42.	112.	0.056	44.14	1.247
EU-152	1932.04	965.92	16.	22.	0.011	99.03	1.714
AC-228	1938.01	968.90	16.	-19.	-0.010	112.19	1.718D
K-40	2926.71	1462.90	8.	472.	0.236	14.05	2.042

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Activity pCi/gm	Code	MDA Value pCi/gm	COMMENTS
BE-7		1.0060E-01					
			477.56	1.006E-01	&(	3.496E-01 1.03E-01	G
K-40		1.1563E+01					
			1460.75	1.156E+01	(P	3.947E-01 5.42E-01	G
MN-54		-7.1574E-03					
			834.81	-7.157E-03	%(P	5.706E-02 1.63E-02	G
CO-57		1.5247E-03					
			122.07	1.525E-03	%(	5.279E-02 1.57E-02	G K
			136.43	6.611E-03	&	3.714E-01 1.10E-01	G
CO-60		-6.3773E-03					
			1332.51	-6.377E-03	%(P	5.418E-02 1.49E-02	G K
			1173.23	7.466E-03	&	5.338E-02 1.50E-02	G K
Sr-85		-1.0745E-02					
			514.00	-1.074E-02	&(	4.890E-02 1.44E-02	G
Kr-85		-2.4852E+02					
			513.99	-2.485E+02	&(	1.127E+03 3.31E+02	G
Y-88		6.4284E-03					
			1836.01	6.428E-03	%(P	4.570E-02 1.21E-02	G K
			898.02	1.463E-02	% P	3.796E-02 1.12E-02	G
NB-94		-4.8633E-03					
			871.10	-4.863E-03	%(	4.707E-02 1.32E-02	G K
			702.50	-3.179E-04	&	3.163E-02 8.48E-03	G K
Ag-108M		-8.0190E-03					
			722.95	-8.019E-03	&(	5.142E-02 1.47E-02	G K
			614.37	-2.280E-02	& P	6.316E-02 1.89E-02	G
			433.93	-1.905E-04	&	3.211E-02 8.95E-03	G
CD-109		-1.0001E-01					
			88.04	-1.000E-01	%(P	2.084E+00 6.21E-01	G
SN-113		-5.9091E-03					
			391.71	-5.909E-03	&(	5.625E-02 1.63E-02	G K
			255.04	-4.293E-01	%	1.677E+00 4.99E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	7.1122E-02						
		427.95	-9.730E-03	%(P	1.104E-01	3.11E-02	G K
		600.77	-6.712E-02	% P	2.449E-01	7.19E-02	G
		636.15	1.335E-01	% P	2.816E-01	8.54E-02	G
		463.51	3.104E-01	(P	3.413E-01	1.09E-01	G
		176.29	1.003E-01	% P	6.132E-01	1.82E-01	G
I-131	-8.8431E-03						
		364.48	-8.843E-03	&(	4.149E-02	1.22E-02	G K
		636.97	1.924E-01	%	4.515E-01	1.36E-01	G
		284.29	-7.726E-04	%	5.546E-01	1.60E-01	G
CS-134	1.2710E-02						
		604.66	1.271E-02	&(	3.697E-02	1.09E-02	G K
		795.76	2.005E-02	%	5.201E-02	1.55E-02	G
		569.29	2.599E-02	%	2.409E-01	6.84E-02	G
		801.84	-1.256E-01	% P	6.075E-01	1.76E-01	G
CS-137	9.7050E-03						
		661.62	9.705E-03	%(	5.007E-02	1.44E-02	G
CE-139	6.9543E-03						
		165.85	6.954E-03	%(P	4.231E-02	1.26E-02	G
EU-152	6.3142E-02						
		121.78	-4.533E-02	%(P	1.517E-01	4.55E-02	G K
		344.30	-1.195E-02	%	1.284E-01	3.73E-02	G
		1408.08	-3.845E-02	&	2.418E-01	6.70E-02	G
		964.00	2.807E-01	(P	2.731E-01	9.36E-02	G
		1112.07	3.645E-03	&	4.155E-01	1.14E-01	G
		778.90	-7.663E-02	& P	4.039E-01	1.17E-01	G
EU-154	1.1944E-02						
		123.10	1.194E-02	&(P	1.051E-01	3.13E-02	G K
		1274.80	-2.401E-02	%	1.884E-01	5.33E-02	G
		723.30	-2.470E-02	& P	2.098E-01	5.90E-02	G
		1004.80	-6.507E-02	&	3.755E-01	1.08E-01	G
EU-155	2.4399E-03						
		86.45	2.440E-03	&(P	1.838E-01	5.43E-02	G K
		105.31	4.287E-02	%	2.401E-01	7.18E-02	G
HG-203	1.2934E-02						
		279.17	1.293E-02	%(P	4.650E-02	1.39E-02	G K
		72.87	-4.632E-01	%	1.951E+00	5.87E-01	G
		70.83	-8.321E-01	%	2.906E+00	8.73E-01	G
		82.50	9.908E-02	%	2.638E+00	7.79E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	2.1412E-01						
		583.14	2.141E-01	@(P	4.427E-02	2.23E-02	G
		510.72	5.106E-01	+	1.799E-01	8.13E-02	G
PB-212	5.6370E-01						
		238.63	5.637E-01	(	1.036E-01	3.98E-02	G K
							Energy duplication
		77.11	7.160E-01	+	5.652E-01	1.77E-01	G
		74.81	6.837E-01	& P	1.151E+00	3.50E-01	G
PB-214	4.0592E-01						
		351.99	3.918E-01	(P	9.442E-02	3.85E-02	G K
		295.22	4.331E-01	(	1.876E-01	6.56E-02	G
							Energy duplication
		77.11	1.171E+00	+	9.245E-01	2.89E-01	G
		241.92	5.526E-02	%	6.871E-01	2.04E-01	G
BI-212	7.0231E-01						
		727.17	7.023E-01	(	3.874E-01	1.75E-01	G K
		1620.56	1.175E-01	% P	1.518E+00	3.86E-01	G
		785.42	-4.609E-01	& P	2.298E+00	6.61E-01	G
BI-214	3.9968E-01						
		609.32	3.997E-01	(	8.554E-02	4.17E-02	G K
		1764.51	-4.201E-03	& P	4.149E-01	1.10E-01	G
		1120.28	3.063E-01	&	4.432E-01	1.39E-01	G
RA-224	4.8388E-02						
		241.00	4.839E-02	&(P	1.223E+00	3.61E-01	G
RA-226	9.1164E-01						
		185.99	9.116E-01	(P	1.223E+00	3.76E-01	G
AC-228	6.7843E-01						
		911.07	6.755E-01	(P	1.994E-01	9.97E-02	G K
		968.90	-2.042E-01	- P	2.280E-01	7.62E-02	G
		338.40	6.855E-01	@(	2.864E-01	1.17E-01	G
TH-227	-9.3987E-02						
		236.00	-9.399E-02	%(P	3.889E-01	1.16E-01	G K
		256.25	-4.884E-02	%	5.105E-01	1.50E-01	G
PA-234	-2.0216E-03						
		98.44	-2.022E-03	%(	2.480E-01	7.37E-02	G K
		946.00	6.166E-02	&	2.401E-01	6.95E-02	G
		131.28	-3.885E-02	&	2.237E-01	6.68E-02	G
		94.67	0.000E+00	%	4.417E-01	1.31E-01	G
		883.24	2.761E-02	%	3.793E-01	1.05E-01	G
		926.70	6.264E-03	%	3.879E-01	1.05E-01	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26 3.818E-02 %   3.574E-01 1.02E-01 G

TH-234      -4.1494E-02
                           63.29-4.149E-02 %(P 3.549E+00 1.05E+00 G K
                           92.80 1.238E+00 %   2.355E+00 7.16E-01 G
                           92.38 1.347E+00 & P 2.730E+00 8.28E-01 G

AM-241       1.2754E-01
                           59.54 1.275E-01 %(  5.792E-01 1.73E-01 G
   ( - This peak used in the nuclide activity average.

   * - Peak is too wide, but only one peak in library.
   ! - Peak is part of a multiplet and this area went
       negative during deconvolution.
   ? - Peak is too narrow.
   @ - Peak is too wide at FW25M, but ok at FWHM.
   % - Peak fails sensitivity test.
   $ - Peak identified, but first peak of this nuclide
       failed one or more qualification tests.
   + - Peak activity higher than counting uncertainty range.
   - - Peak activity lower than counting uncertainty range.
   = - Peak outside analysis energy range.
   & - Calculated peak centroid is not close enough to the
       library energy centroid for positive identification.
   P - Peakbackground subtraction
   } - Peak is too close to another for the activity
       to be found directly.

   Nuclide Codes:                      Peak Codes:
   T - Thermal Neutron Activation      G - Gamma Ray
   F - Fast Neutron Activation         X - X-Ray
   I - Fission Product                 P - Positron Decay
   N - Naturally Occurring Isotope     S - Single-Escape
   P - Photon Reaction                 D - Double-Escape
   C - Charged Particle Reaction       K - Key Line
   M - No MDA Calculation              A - Not in Average
   R - Coincidence Corrected           C - Coincidence Peak
   H - Halflife limit exceeded

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
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***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	1.0040E-01	1.0060E-01	3.0924E-01	3.0929E-01	3.489E-01
K-40		1.1563E+01	1.1563E+01	1.6246E+00	1.7494E+00	3.947E-01
MN-54	#A	-7.1550E-03	-7.1574E-03	5.3834E-02	5.3835E-02	5.704E-02
CO-57	#B	1.5241E-03	1.5247E-03	4.6958E-02	4.6958E-02	5.277E-02
CO-60	#B	-6.3769E-03	-6.3773E-03	4.7508E-02	4.7510E-02	5.417E-02

Sr-85	#A	-1.0728E-02	-1.0745E-02	4.3135E-02	4.3139E-02	4.882E-02
Kr-85	#A	-2.4852E+02	-2.4852E+02	9.9440E+02	9.9450E+02	1.127E+03
Y-88	#B	6.4221E-03	6.4284E-03	3.6314E-02	3.6315E-02	4.566E-02
NB-94	#B	-4.8633E-03	-4.8633E-03	3.9635E-02	3.9635E-02	4.707E-02
Ag-108M	#B	-8.0189E-03	-8.0190E-03	4.4235E-02	4.4237E-02	5.142E-02
CD-109	#A	-9.9986E-02	-1.0001E-01	2.9012E+00	2.9012E+00	2.083E+00
SN-113	#B	-5.9038E-03	-5.9091E-03	4.8850E-02	4.8851E-02	5.620E-02
SB-125	#B	7.1114E-02	7.1122E-02	7.5156E-02	7.5262E-02	1.104E-01
I-131	#B	-8.7295E-03	-8.8431E-03	3.6529E-02	3.6533E-02	4.096E-02
CS-134	#B	1.2708E-02	1.2710E-02	3.2838E-02	3.2846E-02	3.697E-02
CS-137	#A	9.7050E-03	9.7050E-03	4.3345E-02	4.3348E-02	5.007E-02
CE-139	#A	6.9490E-03	6.9543E-03	3.7687E-02	3.7689E-02	4.228E-02
EU-152	#B	6.3141E-02	6.3142E-02	6.3174E-02	6.3271E-02	1.517E-01
EU-154	#B	1.1943E-02	1.1944E-02	9.3802E-02	9.3805E-02	1.051E-01
EU-155	#B	2.4398E-03	2.4399E-03	1.6286E-01	1.6286E-01	1.838E-01
HG-203	#B	1.2905E-02	1.2934E-02	4.1598E-02	4.1604E-02	4.640E-02
TL-208	#	2.1412E-01	2.1412E-01	6.6689E-02	6.7763E-02	
PB-212	#	5.6370E-01	5.6370E-01	1.1931E-01	1.2344E-01	1.036E-01
PB-214	#	4.0592E-01	4.0592E-01	1.0996E-01	1.1229E-01	9.442E-02
BI-212		7.0231E-01	7.0231E-01	5.2415E-01	5.2563E-01	
BI-214		3.9968E-01	3.9968E-01	1.2493E-01	1.2693E-01	
RA-224	#A	4.8388E-02	4.8388E-02	1.0838E+00	1.0838E+00	1.223E+00
RA-226	#A	9.1164E-01	9.1164E-01	1.1267E+00	1.1278E+00	1.223E+00
AC-228		6.7843E-01	6.7843E-01	2.2962E-01	2.3275E-01	
TH-227	#B	-9.3987E-02	-9.3987E-02	3.5783E-01	3.5787E-01	3.889E-01
PA-234	#B	-2.0216E-03	-2.0216E-03	2.2118E-01	2.2118E-01	2.480E-01
TH-234	#B	-4.1494E-02	-4.1494E-02	5.7223E+00	5.7223E+00	3.549E+00
AM-241	#A	1.2754E-01	1.2754E-01	5.1990E-01	5.1995E-01	5.792E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (1119.8 to 1999.0 keV) 1.3557239E+01 pCi/gm
Total Decayed Activity (1119.8 to 1999.0 keV) 1.3557239E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JJM

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 102F_9SEP2006_1249.An1

Sample description
FSS-OOL-05-10-007-F WET

Spectrum Filename: C:\GammaVision\Spectra\102F_9SEP2006_1249.An1

Acquisition information
Start time: 09-Sep-2006 12:49:40
Live time: 2000
Real time: 2018
Dead time: 0.88 %
Detector ID: 3

Detector system
Det 102 - DSPP-468

Calibration
Filename: D2_1LSa.Clb
DET 102 1 Liter Sand Geometry

Energy Calibration
Created: 15-Jan-2005 03:09:29
Zero offset: 0.220 keV
Gain: 0.500 keV/channel
Quadratic: -6.435E-08 keV/channel^2

Efficiency Calibration
Created: 15-Jan-2005 06:48:10
Type: Polynomial
Uncertainty: 0.497 %
Coefficients: -0.294180 -5.980622 0.744607
-0.096737 0.005214 -0.000120

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.22keV)
Stop channel: 4000 (1999.02keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 1.9700E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.9700E+03) =
5.0761E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	09-Sep-2006 09:53:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	102_150K_28APR05.Pbc 01-May-2005 05:27:47
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 10 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.6355

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
77.20	157.	24.87	1.50	9.541E-03	77.11	10.700	1.054E+00	PB214
					77.11	17.500	6.447E-01	PB212
77.20	157.	24.87	1.50	9.541E-03	77.11	10.700	1.054E+00	PB214
					77.11	17.500	6.447E-01	PB212
129.29	81.	31.40	1.28	1.716E-02				
186.02	90.	31.57	1.69	1.627E-02	185.99	3.280	PBC<MDA	RA226
239.00	464.	5.73	1.22	1.379E-02	238.63	43.100	5.354E-01	PB212
					241.92	7.470	3.123E+00	PB214
242.16	71.	24.94	1.22	1.365E-02				
270.07	93.	22.16	1.61	1.243E-02				
295.66	86.	18.31	1.35	1.145E-02	295.22	19.200	2.680E-01	PB214
339.17	139.	16.23	1.29	1.004E-02	338.40	12.010	7.909E-01	AC228
352.37	269.	8.83	0.93	9.668E-03	351.99	37.100	5.137E-01	PB214
511.56	49.	25.98	1.50	6.695E-03	510.72	22.500	2.244E-01	TL208
					513.99	0.004	1.182E+03	Kr85
					514.00	99.270	5.125E-02	Sr85
584.06	148.	10.86	1.56	5.881E-03	583.14	86.000	1.999E-01	TL208
610.26	164.	11.74	1.45	5.641E-03	609.32	46.090	4.315E-01	BI214
728.27	22.	37.10	1.55	4.794E-03	727.17	11.800	PBC<MDA	BI212
912.70	96.	11.93	1.91	3.916E-03	911.07	29.000	5.776E-01	AC228
969.69	88.	16.89	1.30	3.715E-03	968.90	17.460	9.338E-01	AC228
1462.92	429.	4.83	1.92	2.617E-03				

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide

258.17	129.29	267.	81.	0.040	92.21	1.281	AC-228	s
477.64	238.95	122.	464.	0.232	17.19	1.215	PB-212	D

Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM	Suspected	
483.95	242.10	120.	71.	0.035	74.82	1.217	PB-214	D
539.79	270.07	126.	93.	0.046	66.49	1.607	AC-228	s
1939.59	969.69	70.	49.	0.025	83.88	1.304	AC-228	s
2244.09	1121.85	28.	48.	0.024	74.42	1.197	TA-182	l
2926.75	1462.92	4.	425.	0.212	14.71	1.920	K-40	M

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.
M - Peak is close to a library peak.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-214	153.80	77.11	683.	157.	0.078	74.60	1.500D
PB-212	153.80	77.11	683.	157.	0.078	74.60	1.500D
RA-226	372.63	186.51	339.	87.	0.044	90.44	1.500s
PB-212	477.63	239.00	265.	383.	0.191	23.69	1.500
PB-214	477.59	238.98	106.	442.	0.221	17.34	1.500s
PB-214	591.17	295.76	146.	86.	0.043	67.85	1.500
AC-228	678.01	339.17	113.	139.	0.070	48.69	1.288s
PB-214	704.62	352.47	77.	221.	0.111	26.23	1.500s
TL-208	1022.90	511.56	57.	49.	0.025	77.94	1.500s
TL-208	1168.08	584.12	33.	135.	0.068	31.32	1.499
BI-214	1220.37	610.26	57.	164.	0.082	35.22	1.445
BI-212	1456.50	728.27	24.	22.	0.011	111.29	1.554s
AC-228	1825.53	912.70	11.	96.	0.048	35.79	1.910s
AC-228	1940.79	970.29	28.	39.	0.020	74.78	1.718

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	Peak MDA Value pCi/gm	COMMENTS
BE-7		1.0519E-01					
			477.56	1.052E-01	%(	3.082E-01 9.14E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
K-40	1.0274E-01						
		1460.75	1.027E-01	%(P	4.190E-01	1.18E-01	G
MN-54	-4.9759E-03						
		834.81	-4.976E-03	%(P	5.095E-02	1.44E-02	G
CO-57	1.0551E-02						
		122.07	1.055E-02	%(	4.867E-02	1.46E-02	G K
		136.43	-3.982E-02	&	3.688E-01	1.10E-01	G
CO-60	1.9060E-03						
		1332.51	1.906E-03	%(P	5.797E-02	1.57E-02	G K
		1173.23	-3.812E-04	%	6.452E-02	1.78E-02	G K
Sr-85	-1.7990E-04						
		514.00	-1.799E-04	%(	4.566E-02	1.30E-02	G
Kr-85	-3.4327E+00						
		513.99	-3.433E+00	%(	1.052E+03	3.00E+02	G
Y-88	-3.8058E-03						
		1836.01	-3.806E-03	%(P	4.164E-02	1.06E-02	G K
		898.02	1.043E-03	% P	4.964E-02	1.35E-02	G
NB-94	-1.2418E-03						
		871.10	-1.242E-03	&(	3.679E-02	9.89E-03	G K
		702.50	4.338E-03	%	4.121E-02	1.16E-02	G K
Ag-108M	-7.8166E-03						
		722.95	-7.817E-03	%(	4.596E-02	1.31E-02	G K
		614.37	-3.524E-03	& P	5.114E-02	1.45E-02	G
		433.93	8.407E-03	%	3.164E-02	9.26E-03	G
CD-109	1.0724E-01						
		88.04	1.072E-01	%(P	2.007E+00	5.98E-01	G
SN-113	-6.4432E-03						
		391.71	-6.443E-03	%(	5.580E-02	1.62E-02	G K
		255.04	1.512E-03	&	1.642E+00	4.78E-01	G
SB-125	2.0843E-05						
		427.95	2.084E-05	%(P	1.068E-01	2.99E-02	G K
		600.77	4.551E-02	& P	1.905E-01	5.51E-02	G
		636.15	-7.844E-02	% P	4.193E-01	1.22E-01	G
		463.51	1.022E-01	% P	3.603E-01	1.06E-01	G
		176.29	-1.387E-02	& P	5.721E-01	1.68E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
I-131	9.4992E-03						
		364.48	9.499E-03	&(	4.701E-02	1.38E-02	G K
		636.97	0.000E+00	&	5.716E-01	1.59E-01	G
		284.29	-1.033E-01	%	5.945E-01	1.75E-01	G
CS-134	1.4211E-02						
		604.66	1.421E-02	%(	3.806E-02	1.13E-02	G K
		795.76	8.087E-03	%	5.541E-02	1.58E-02	G
		569.29	-2.813E-02	%	2.378E-01	6.77E-02	G
		801.84	-1.606E-02	% P	5.817E-01	1.63E-01	G
CS-137	-6.1769E-03						
		661.62	-6.177E-03	%(	4.949E-02	1.41E-02	G
CE-139	-1.9245E-03						
		165.85	-1.925E-03	%(P	4.725E-02	1.39E-02	G
EU-152	2.6859E-02						
		121.78	2.686E-02	%(P	1.443E-01	4.31E-02	G K
		344.30	9.564E-04	%	1.249E-01	3.58E-02	G
		1408.08	-3.552E-02	&	2.631E-01	7.30E-02	G
		964.00	6.570E-02	% P	2.297E-01	6.57E-02	G
		1112.07	2.585E-02	&	3.936E-01	1.09E-01	G
		778.90	3.850E-02	& P	3.025E-01	8.48E-02	G
EU-154	1.9317E-03						
		123.10	1.932E-03	&(P	1.002E-01	2.96E-02	G K
		1274.80	-2.780E-02	%	1.976E-01	5.62E-02	G
		723.30	-3.962E-02	% P	2.109E-01	6.02E-02	G
		1004.80	-5.247E-02	&	3.034E-01	8.65E-02	G
EU-155	-8.2241E-03						
		86.45	-8.224E-03	&(P	2.026E-01	5.99E-02	G K
		105.31	5.808E-02	%	2.233E-01	6.70E-02	G
HG-203	-6.4724E-05						
		279.17	-6.472E-05	&(P	4.500E-02	1.31E-02	G K
		72.87	-3.821E-02	%	1.178E+00	3.47E-01	G
		70.83	2.749E-02	%	3.654E+00	1.09E+00	G
		82.50	-5.197E-01	%	3.557E+00	1.06E+00	G
TL-208	1.9170E-01						
		583.14	1.831E-01	(P	3.983E-02	1.92E-02	G
		510.72	2.244E-01	*(	1.730E-01	5.83E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
PB-212	4.4105E-01						
		238.63	4.410E-01	(	9.056E-02	3.48E-02	G K
							Energy duplication
		77.11	6.447E-01	+	5.114E-01	1.60E-01	G
		74.81	2.920E-01	& P	1.099E+00	3.30E-01	G
PB-214	4.2267E-01						
		351.99	4.227E-01	@(P	8.348E-02	3.70E-02	G K
		295.22	2.681E-01	-	1.841E-01	6.06E-02	G
							Energy duplication
		77.11	1.054E+00	+	8.364E-01	2.62E-01	G
		241.92	2.974E+00	+	3.405E-01	1.72E-01	G
BI-212	2.7283E-01						
		727.17	2.728E-01	@(	3.073E-01	1.01E-01	G K
		1620.56	-2.713E-01	% P	1.852E+00	4.94E-01	G
		785.42	1.199E+00	% P	1.761E+00	5.60E-01	G
BI-214	4.3153E-01						
		609.32	4.315E-01	(	9.999E-02	5.07E-02	G K
		1764.51	-3.931E-02	% P	4.141E-01	1.13E-01	G
		1120.28	-5.163E-02	&	4.716E-01	1.34E-01	G
RA-224	7.2695E-01						
		241.00	7.270E-01	&(P	1.033E+00	3.18E-01	G
RA-226	1.1187E+00						
		185.99	1.119E+00	(P	1.138E+00	3.55E-01	G
AC-228	5.7762E-01						
		911.07	5.776E-01	*(P	1.105E-01	6.92E-02	G K
		968.90	4.144E-01	- P	2.905E-01	1.03E-01	G
		338.40	7.909E-01	+	2.963E-01	1.28E-01	G
TH-227	-2.4912E-01						
		236.00	-2.491E-01	%(P	4.417E-01	1.34E-01	G K
		256.25	1.569E-01	%	4.630E-01	1.39E-01	G
PA-234	5.4498E-02						
		98.44	5.450E-02	%(	2.256E-01	6.77E-02	G K
		946.00	-9.848E-03	%	2.088E-01	5.67E-02	G
		131.28	3.900E-03	&	1.738E-01	5.12E-02	G
		94.67	-9.915E-02	%	4.180E-01	1.25E-01	G
		883.24	6.464E-02	%	3.463E-01	9.82E-02	G
		926.70	-2.520E-02	%	3.513E-01	9.55E-02	G
		569.26	-4.159E-02	%	3.530E-01	1.00E-01	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments

TH-234      -1.3782E+00
                           63.29-1.378E+00 %(P 3.839E+00 1.16E+00 G K
                           92.80 1.200E+00 &   2.256E+00 6.86E-01 G
                           92.38 1.329E+00 % P 2.691E+00 8.16E-01 G

AM-241       7.5954E-02
                           59.54 7.595E-02 %(  5.841E-01 1.74E-01 G
   ( - This peak used in the nuclide activity average.

   * - Peak is too wide, but only one peak in library.
   ! - Peak is part of a multiplet and this area went
       negative during deconvolution.
   ? - Peak is too narrow.
   @ - Peak is too wide at FW25M, but ok at FWHM.
   % - Peak fails sensitivity test.
   $ - Peak identified, but first peak of this nuclide
       failed one or more qualification tests.
   + - Peak activity higher than counting uncertainty range.
   - - Peak activity lower than counting uncertainty range.
   = - Peak outside analysis energy range.
   & - Calculated peak centroid is not close enough to the
       library energy centroid for positive identification.
   P - Peakbackground subtraction
   } - Peak is too close to another for the activity
       to be found directly.

   Nuclide Codes:                      Peak Codes:
   T - Thermal Neutron Activation      G - Gamma Ray
   F - Fast Neutron Activation         X - X-Ray
   I - Fission Product                 P - Positron Decay
   N - Naturally Occurring Isotope     S - Single-Escape
   P - Photon Reaction                 D - Double-Escape
   C - Charged Particle Reaction       K - Key Line
   M - No MDA Calculation              A - Not in Average
   R - Coincidence Corrected           C - Coincidence Peak
   H - Halflife limit exceeded

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
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***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	1.0502E-01	1.0519E-01	2.7419E-01	2.7425E-01	3.077E-01
K-40	A	1.0274E-01	1.0274E-01	3.5348E-01	3.5352E-01	4.190E-01
MN-54	#A	-4.9746E-03	-4.9759E-03	4.9490E-02	4.9491E-02	5.094E-02
CO-57	#B	1.0547E-02	1.0551E-02	4.3657E-02	4.3661E-02	4.866E-02
CO-60	#B	1.9059E-03	1.9060E-03	4.7204E-02	4.7204E-02	5.797E-02
Sr-85	#A	-1.7966E-04	-1.7990E-04	3.9024E-02	3.9024E-02	4.560E-02

Kr-85	#A	-3.4327E+00	-3.4327E+00	8.9948E+02	8.9948E+02	1.052E+03
Y-88	#B	-3.8028E-03	-3.8058E-03	3.2084E-02	3.2085E-02	4.161E-02
NB-94	#B	-1.2418E-03	-1.2418E-03	2.9669E-02	2.9669E-02	3.679E-02
Ag-108M	#B	-7.8166E-03	-7.8166E-03	3.9390E-02	3.9393E-02	4.596E-02
CD-109	#A	1.0722E-01	1.0724E-01	1.7939E+00	1.7939E+00	2.006E+00
SN-113	#B	-6.4385E-03	-6.4432E-03	4.8510E-02	4.8512E-02	5.576E-02
SB-125	#B	2.0842E-05	2.0843E-05	8.9655E-02	8.9655E-02	1.068E-01
I-131	#B	9.3992E-03	9.4992E-03	4.1501E-02	4.1505E-02	4.652E-02
CS-134	#B	1.4210E-02	1.4211E-02	3.4010E-02	3.4020E-02	3.805E-02
CS-137	#A	-6.1768E-03	-6.1769E-03	4.2267E-02	4.2269E-02	4.949E-02
CE-139	#A	-1.9233E-03	-1.9245E-03	5.2671E-02	5.2671E-02	4.723E-02
EU-152	#B	2.6859E-02	2.6859E-02	1.2916E-01	1.2917E-01	1.443E-01
EU-154	#B	1.9316E-03	1.9317E-03	8.8834E-02	8.8834E-02	1.002E-01
EU-155	#B	-8.2237E-03	-8.2241E-03	1.7221E+00	1.7221E+00	2.026E-01
HG-203	#B	-6.4606E-05	-6.4724E-05	7.2700E-03	7.2700E-03	4.491E-02
TL-208	#	1.9170E-01	1.9170E-01	6.0216E-02	6.1169E-02	3.983E-02
PB-212	#	4.4105E-01	4.4105E-01	1.0447E-01	1.0736E-01	9.056E-02
PB-214	#	4.2267E-01	4.2267E-01	1.1107E-01	1.1357E-01	8.348E-02
BI-212	#A	2.7283E-01	2.7283E-01	3.0364E-01	3.0402E-01	3.073E-01
BI-214		4.3153E-01	4.3153E-01	1.5197E-01	1.5389E-01	
RA-224	#A	7.2695E-01	7.2695E-01	9.5300E-01	9.5387E-01	1.033E+00
RA-226	#A	1.1187E+00	1.1187E+00	1.0636E+00	1.0655E+00	1.138E+00
AC-228	#	5.7762E-01	5.7762E-01	2.0725E-01	2.0977E-01	
TH-227	#B	-2.4912E-01	-2.4912E-01	4.0755E-01	4.0779E-01	4.417E-01
PA-234	#B	5.4498E-02	5.4498E-02	2.0300E-01	2.0302E-01	2.256E-01
TH-234	#B	-1.3782E+00	-1.3782E+00	3.5311E+00	3.5319E+00	3.839E+00
AM-241	#A	7.5954E-02	7.5954E-02	5.2195E-01	5.2197E-01	5.841E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (969.4 to 1999.0 keV) 1.0091528E+00 pCi/gm
Total Decayed Activity (969.4 to 1999.0 keV) 1.0091528E+00 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JJM

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 102F_9SEP2006_1411.An1

Sample description
FSS-OOL-05-08-007-F-A

Spectrum Filename: C:\GammaVision\Spectra\102F_9SEP2006_1411.An1

Acquisition information
Start time: 09-Sep-2006 14:11:14
Live time: 2000
Real time: 2011
Dead time: 0.53 %
Detector ID: 3

Detector system
Det 102 - DSPP-468

Calibration
Filename: D2_1LSa.Clb
DET 102 1 Liter Sand Geometry

Energy Calibration
Created: 15-Jan-2005 03:09:29
Zero offset: 0.220 keV
Gain: 0.500 keV/channel
Quadratic: -6.435E-08 keV/channel^2

Efficiency Calibration
Created: 15-Jan-2005 06:48:10
Type: Polynomial
Uncertainty: 0.497 %
Coefficients: -0.294180 -5.980622 0.744607
-0.096737 0.005214 -0.000120

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.22keV)
Stop channel: 4000 (1999.02keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 1.4220E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.4220E+03) =
7.0323E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

YAEC Chemistry Lab Spectrum name: 102F_9SEP2006_1411.An1

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	09-Sep-2006 07:45:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	102_150K_28APR05.Pbc 01-May-2005 05:27:47
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 12 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.7817

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
77.15	90.	32.49	1.50	9.541E-03	77.11	10.700	PBC<MDA	PB214
					77.11	17.500	5.113E-01	PB212
77.15	90.	32.49	1.50	9.541E-03	77.11	10.700	8.363E-01	PB214
					77.11	17.500	5.113E-01	PB212
85.73	107.	31.21	1.85	1.182E-02				
85.73	107.	31.21	1.85	1.182E-02	86.45	32.740	2.506E-01	EU155
186.08	49.	38.88	1.50	1.627E-02	185.99	3.280	PBC<MDA	RA226
238.94	156.	10.37	1.21	1.380E-02	238.63	43.100	2.495E-01	PB212
243.19	39.	36.42	1.22	1.360E-02	241.00	3.900	PBC<MDA	RA224
					241.92	7.470	3.595E-01	PB214
295.37	119.	13.97	1.33	1.146E-02	295.22	19.200	5.137E-01	PB214
338.62	56.	30.41	0.80	1.005E-02	338.40	12.010	4.405E-01	AC228
352.44	212.	9.36	1.41	9.666E-03	351.99	37.100	5.606E-01	PB214
511.93	30.	30.76	1.50	6.695E-03	510.72	22.500	1.884E-01	TL208
584.41	42.	21.08	1.49	5.878E-03	583.14	86.000	7.841E-02	TL208
610.21	148.	10.44	1.10	5.642E-03	609.32	46.090	5.391E-01	BI214
913.01	43.	19.16	1.54	3.915E-03	911.07	29.000	3.557E-01	AC228
969.77	23.	31.99	0.98	3.715E-03				
1121.86	40.	17.07	1.86	3.283E-03	1120.28	15.040	7.679E-01	BI214
1463.05	121.	9.09	1.98	2.617E-03				

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

Peak Centroid Channel	Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
171.04	85.73	376.	107.	0.054	93.64	1.850	BI-207	1

1939.76	969.77	9.	24.	0.012	82.61	0.978	AC-228	s
2927.02	1463.05	-1.	122.	0.061	26.79	1.983	K-40	M

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.
M - Peak is close to a library peak.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-214	153.80	77.11	381.	90.	0.045	97.46	1.500D
PB-212	153.80	77.11	381.	90.	0.045	97.46	1.500D
PB-212	477.50	238.93	158.	131.	0.066	48.25	1.500
RA-224	484.26	242.31	118.	60.	0.030	84.38	1.500
PB-214	484.06	242.22	129.	57.	0.029	93.28	1.500
PB-214	591.21	295.78	63.	112.	0.056	41.36	1.500s
AC-228	677.19	338.75	44.	31.	0.016	104.54	1.500s
PB-214	704.59	352.45	46.	193.	0.097	26.16	1.500
TL-208	1023.64	511.93	27.	30.	0.015	92.29	1.500
TL-208	1168.66	584.41	17.	42.	0.021	63.25	1.494
BI-214	1220.27	610.21	24.	148.	0.074	31.31	1.102
AC-228	1825.96	912.91	13.	27.	0.013	79.59	1.679s
BI-214	2244.11	1121.86	2.	40.	0.020	51.22	1.860

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	Peak MDA Value pCi/gm	COMMENTS
BE-7		-4.1231E-02					
			477.56	-4.123E-02	%(	3.471E-01 9.75E-02	G
K-40		-5.4272E-02					
			1460.75	-5.427E-02	%(P	7.124E-01 1.92E-01	G
MN-54		-1.6170E-03					
			834.81	-1.617E-03	&(P	5.170E-02 1.39E-02	G
CO-57		1.5627E-02					
			122.07	1.563E-02	&(	4.428E-02 1.33E-02	G K
			136.43	-1.247E-01	%	3.845E-01 1.15E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CO-60	-5.3833E-03						
		1332.51	-5.383E-03	&(P	7.177E-02	1.94E-02	G K
		1173.23	-7.213E-03	%	5.817E-02	1.59E-02	G K
Sr-85	-3.9946E-03						
		514.00	-3.995E-03	%(	4.440E-02	1.25E-02	G
Kr-85	-9.1772E+01						
		513.99	-9.177E+01	%(	1.022E+03	2.88E+02	G
Y-88	-2.9269E-05						
		1836.01	-2.927E-05	%(P	3.287E-02	4.46E-03	G K
		898.02	-1.505E-02	% P	6.239E-02	1.76E-02	G
NB-94	-1.2008E-02						
		871.10	-1.201E-02	%(	5.998E-02	1.71E-02	G K
		702.50	-2.122E-03	&	4.430E-02	1.20E-02	G K
Ag-108M	6.9035E-03						
		722.95	6.904E-03	%(	4.551E-02	1.26E-02	G K
		614.37	-1.965E-02	& P	6.623E-02	1.95E-02	G
		433.93	-6.297E-03	%	3.957E-02	1.13E-02	G
CD-109	-4.5655E-01						
		88.04	-4.566E-01	&(P	2.264E+00	6.76E-01	G
SN-113	-6.9304E-03						
		391.71	-6.930E-03	%(	5.835E-02	1.67E-02	G K
		255.04	-2.829E-01	%	1.796E+00	5.26E-01	G
SB-125	6.2318E-03						
		427.95	6.232E-03	&(P	8.942E-02	2.40E-02	G K
		600.77	-8.492E-03	& P	2.150E-01	5.82E-02	G
		636.15	-5.429E-04	% P	3.252E-01	8.57E-02	G
		463.51	5.609E-02	% P	3.165E-01	8.81E-02	G
		176.29	-1.366E-02	& P	6.131E-01	1.78E-01	G
I-131	2.3709E-04						
		364.48	2.371E-04	&(	3.603E-02	9.90E-03	G K
		636.97	0.000E+00	&	5.868E-01	1.58E-01	G
		284.29	1.439E-02	&	6.989E-01	2.01E-01	G
CS-134	-5.8475E-03						
		604.66	-5.847E-03	%(	4.674E-02	1.32E-02	G K
		795.76	9.801E-03	%	4.786E-02	1.34E-02	G
		569.29	1.880E-02	&	2.462E-01	6.78E-02	G
		801.84	1.594E-01	& P	5.718E-01	1.65E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CS-137	7.0816E-03						
		661.62	7.082E-03	%(	4.909E-02	1.37E-02	G
CE-139	-4.3938E-03						
		165.85	-4.394E-03	%(P	4.821E-02	1.41E-02	G
EU-152	-3.7540E-03						
		121.78	-3.754E-03	&(P	1.497E-01	4.38E-02	G K
		344.30	2.080E-02	%	1.054E-01	3.03E-02	G
		1408.08	-1.312E-02	%	3.172E-01	8.39E-02	G
		964.00	2.676E-03	& P	3.175E-01	8.19E-02	G
		1112.07	1.211E-01	%	3.511E-01	1.03E-01	G
		778.90	-1.475E-03	% P	3.233E-01	8.46E-02	G
EU-154	-2.4399E-02						
		123.10	-2.440E-02	%(P	1.134E-01	3.38E-02	G K
		1274.80	1.382E-02	&	1.643E-01	4.38E-02	G
		723.30	2.314E-02	% P	2.210E-01	6.06E-02	G
		1004.80	-1.418E-02	&	3.369E-01	9.11E-02	G
EU-155	1.0361E-01						
		86.45	1.036E-01	%(P	2.441E-01	7.37E-02	G K
		105.31	0.000E+00	%	2.418E-01	7.10E-02	G
HG-203	8.0315E-03						
		279.17	8.031E-03	%(P	4.341E-02	1.27E-02	G K
		72.87	-4.178E-01	&	1.904E+00	5.70E-01	G
		70.83	-8.523E-01	%	3.486E+00	1.04E+00	G
		82.50	-1.092E+00	%	3.573E+00	1.07E+00	G
TL-208	7.8409E-02						
		583.14	7.841E-02	(P	4.135E-02	1.67E-02	G
		510.72	1.884E-01	+	1.706E-01	5.80E-02	G
PB-212	2.0992E-01						
		238.63	2.099E-01	(	9.780E-02	3.38E-02	G K
							Energy duplication
		77.11	5.113E-01	+	5.331E-01	1.66E-01	G
		74.81	4.896E-01	& P	1.136E+00	3.43E-01	G
PB-214	5.0548E-01						
		351.99	5.120E-01	(P	9.108E-02	4.47E-02	G K
		295.22	4.825E-01	@(	1.711E-01	6.65E-02	G
							Energy duplication
		77.11	8.363E-01	+	8.719E-01	2.72E-01	G
		241.92	5.319E-01	&(	5.184E-01	1.65E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
BI-212	2.1379E-03						
		727.17	2.138E-03	%(	4.593E-01	1.26E-01	G K
		1620.56	3.825E-02	% P	1.644E+00	3.78E-01	G
		785.42	-1.607E-02	% P	2.018E+00	5.26E-01	G
BI-214	5.3907E-01						
		609.32	5.391E-01	(	9.373E-02	5.63E-02	G K
		1764.51	1.631E-01	% P	2.739E-01	8.97E-02	G
		1120.28	7.679E-01	+	1.821E-01	1.31E-01	G
RA-224	1.0639E+00						
		241.00	1.064E+00	&(P	9.476E-01	3.05E-01	G
RA-226	8.7379E-01						
		185.99	8.738E-01	%(P	1.205E+00	3.71E-01	G
AC-228	2.3132E-01						
		911.07	2.249E-01	?(P	1.608E-01	6.02E-02	G K
		968.90	-3.987E-03	% P	2.984E-01	7.87E-02	G
		338.40	2.468E-01	@(	2.646E-01	8.60E-02	G
TH-227	-9.6396E-02						
		236.00	-9.640E-02	%(P	3.945E-01	1.17E-01	G K
		256.25	8.727E-02	&	5.210E-01	1.52E-01	G
PA-234	2.8128E-03						
		98.44	2.813E-03	%(	2.638E-01	7.79E-02	G K
		946.00	-2.490E-02	%	2.392E-01	6.48E-02	G
		131.28	-1.965E-02	%	2.042E-01	6.02E-02	G
		94.67	2.603E-02	%	4.305E-01	1.27E-01	G
		883.24	-4.143E-02	%	4.199E-01	1.15E-01	G
		926.70	-2.030E-02	&	4.141E-01	1.09E-01	G
		569.26	7.648E-02	&	3.353E-01	9.56E-02	G
TH-234	1.9322E+00						
		63.29	1.932E+00	%(P	4.796E+00	1.45E+00	G K
		92.80	1.031E+00	%	2.295E+00	6.95E-01	G
		92.38	1.132E+00	% P	2.804E+00	8.46E-01	G
AM-241	4.7256E-02						
		59.54	4.726E-02	%(	6.962E-01	2.06E-01	G

(- This peak used in the nuclide activity average.

* - Peak is too wide, but only one peak in library.
! - Peak is part of a multiplet and this area went negative during deconvolution.

? - Peak is too narrow.
@ - Peak is too wide at FW25M, but ok at FWHM.
% - Peak fails sensitivity test.
$ - Peak identified, but first peak of this nuclide failed one or more qualification tests.
+ - Peak activity higher than counting uncertainty range.
- - Peak activity lower than counting uncertainty range.
= - Peak outside analysis energy range.
& - Calculated peak centroid is not close enough to the library energy centroid for positive identification.
P - Peakbackground subtraction
} - Peak is too close to another for the activity to be found directly.

Nuclide Codes:
T - Thermal Neutron Activation
F - Fast Neutron Activation
I - Fission Product
N - Naturally Occurring Isotope
P - Photon Reaction
C - Charged Particle Reaction
M - No MDA Calculation
R - Coincidence Corrected
H - Halflife limit exceeded

Peak Codes:
G - Gamma Ray
X - X-Ray
P - Positron Decay
S - Single-Escape
D - Double-Escape
K - Key Line
A - Not in Average
C - Coincidence Peak

- -

***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	-4.1087E-02	-4.1231E-02	2.9240E-01	2.9241E-01	3.459E-01
K-40	#A	-5.4272E-02	-5.4272E-02	6.9523E-01	6.9524E-01	7.124E-01
MN-54	#A	-1.6160E-03	-1.6170E-03	7.6582E-02	7.6582E-02	5.167E-02
CO-57	#B	1.5616E-02	1.5627E-02	3.9869E-02	3.9879E-02	4.425E-02
CO-60	#B	-5.3828E-03	-5.3833E-03	6.4211E-02	6.4211E-02	7.177E-02
Sr-85	#A	-3.9832E-03	-3.9946E-03	3.7564E-02	3.7564E-02	4.428E-02
Kr-85	#A	-9.1772E+01	-9.1772E+01	8.6461E+02	8.6462E+02	1.022E+03
Y-88	#B	-2.9218E-05	-2.9269E-05	1.7562E-04	1.7562E-04	3.281E-02
NB-94	#B	-1.2008E-02	-1.2008E-02	5.1369E-02	5.1373E-02	5.998E-02
Ag-108M	#B	6.9035E-03	6.9035E-03	3.7887E-02	3.7889E-02	4.551E-02
CD-109	#A	-4.5637E-01	-4.5655E-01	2.3142E+00	2.3143E+00	2.263E+00
SN-113	#B	-6.9192E-03	-6.9304E-03	4.9992E-02	4.9994E-02	5.825E-02
SB-125	#B	6.2307E-03	6.2318E-03	7.2027E-02	7.2028E-02	8.940E-02
I-131	#B	2.3167E-04	2.3709E-04	2.9687E-02	2.9687E-02	3.520E-02
CS-134	#B	-5.8460E-03	-5.8475E-03	3.9492E-02	3.9493E-02	4.673E-02
CS-137	#A	7.0815E-03	7.0816E-03	4.1094E-02	4.1096E-02	4.909E-02
CE-139	#A	-4.3878E-03	-4.3938E-03	4.8764E-02	4.8765E-02	4.814E-02
EU-152	#B	-3.7539E-03	-3.7540E-03	3.4793E-01	3.4793E-01	1.497E-01
EU-154	#B	-2.4397E-02	-2.4399E-02	1.0366E-01	1.0367E-01	1.134E-01
EU-155	#B	1.0360E-01	1.0361E-01	2.2096E-01	2.2103E-01	2.441E-01

HG-203 #B	7.9995E-03	8.0315E-03	3.8053E-02	3.8056E-02	4.324E-02

TL-208		7.8409E-02	7.8409E-02	5.0076E-02	5.0269E-02	
PB-212	#	2.0992E-01	2.0992E-01	1.0129E-01	1.0197E-01	9.780E-02
PB-214	#	5.0548E-01	5.0548E-01	1.3248E-01	1.3548E-01	9.108E-02
BI-212	#B	2.1379E-03	2.1379E-03	3.7717E-01	3.7717E-01	4.593E-01
BI-214		5.3907E-01	5.3907E-01	1.6878E-01	1.7147E-01	
RA-224	#	1.0639E+00	1.0639E+00	9.1520E-01	9.1715E-01	9.476E-01
RA-226	#A	8.7379E-01	8.7379E-01	1.1119E+00	1.1129E+00	1.205E+00
AC-228	#	2.3132E-01	2.3132E-01	1.5244E-01	1.5299E-01	1.608E-01
TH-227	#B	-9.6396E-02	-9.6396E-02	3.6419E-01	3.6423E-01	3.945E-01
PA-234	#B	2.8128E-03	2.8128E-03	2.3381E-01	2.3381E-01	2.638E-01
TH-234	#B	1.9322E+00	1.9322E+00	4.3431E+00	4.3445E+00	4.796E+00
AM-241	#A	4.7256E-02	4.7256E-02	6.1786E-01	6.1787E-01	6.962E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (50.2 to 1999.0 keV) 6.1748308E-01 pCi/gm
Total Decayed Activity (50.2 to 1999.0 keV) 6.1748308E-01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JJM

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 102F_11SEPT2006_1155.An1

Sample description
FSS-OOL-05-10-015-F-A

Spectrum Filename: C:\GammaVision\Spectra\102F_11SEPT2006_1155.An1

Acquisition information
Start time: 11-Sep-2006 11:55:57
Live time: 2000
Real time: 2010
Dead time: 0.52 %
Detector ID: 3

Detector system
Det 102 - DSPP-468

Calibration
Filename: D2_1LSa.Clb
DET 102 1 Liter Sand Geometry

Energy Calibration
Created: 15-Jan-2005 03:09:29
Zero offset: 0.220 keV
Gain: 0.500 keV/channel
Quadratic: -6.435E-08 keV/channel^2

Efficiency Calibration
Created: 15-Jan-2005 06:48:10
Type: Polynomial
Uncertainty: 0.497 %
Coefficients: -0.294180 -5.980622 0.744607
-0.096737 0.005214 -0.000120

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.22keV)
Stop channel: 4000 (1999.02keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 1.3320E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.3320E+03) =
7.5075E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	09-Sep-2006 12:00:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	102_150K_28APR05.Pbc 01-May-2005 05:27:47
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 9 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.6336

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
71.21	51.	37.35	0.00	7.687E-03				
186.09	62.	24.68	1.24	1.626E-02	185.99	3.280	PBC<MDA	RA226
238.99	152.	11.06	1.22	1.379E-02	238.63	43.100	2.597E-01	PB212
242.62	79.	17.95	1.22	1.362E-02	241.00	3.900	1.478E+00	RA224
					241.92	7.470	7.858E-01	PB214
295.54	166.	10.58	1.29	1.145E-02	295.22	19.200	7.650E-01	PB214
339.26	33.	29.80	1.13	1.004E-02	338.40	12.010	2.788E-01	AC228
352.49	220.	7.97	1.48	9.665E-03	351.99	37.100	6.196E-01	PB214
511.47	30.	35.81	1.50	6.695E-03	510.72	22.500	PBC<MDA	TL208
583.89	60.	16.53	1.64	5.883E-03	583.14	86.000	1.186E-01	TL208
610.25	174.	8.56	1.51	5.641E-03	609.32	46.090	6.780E-01	BI214
912.49	26.	25.98	1.68	3.922E-03	911.07	29.000	2.344E-01	AC228
1121.66	49.	17.54	1.84	3.283E-03	1120.28	15.040	1.003E+00	BI214
1463.09	130.	8.77	2.01	2.617E-03	1460.75	10.700	4.698E+00	K40

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
477.61	238.94	66.	152.	0.076	33.17	1.215	PB-212	D
484.87	242.57	61.	79.	0.039	53.84	1.218	XE-138	D

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
RA-226	371.68	186.03	166.	60.	0.030	92.22	1.500
PB-212	477.77	239.07	190.	110.	0.055	60.19	1.500
RA-224	484.46	242.41	148.	71.	0.036	79.52	1.500
PB-214	484.48	242.43	157.	70.	0.035	83.78	1.500
PB-214	591.11	295.73	51.	155.	0.077	31.09	1.500
AC-228	677.72	339.02	41.	35.	0.017	93.32	1.500
PB-214	704.60	352.46	34.	203.	0.102	24.26	1.500s
TL-208	1022.73	511.47	41.	30.	0.015	107.43	1.499s
TL-208	1168.09	584.13	14.	53.	0.026	50.68	1.499
BI-214	1220.36	610.25	16.	174.	0.087	25.69	1.511
AC-228	1825.11	912.49	11.	26.	0.013	77.93	1.679s
BI-214	2243.73	1121.66	7.	49.	0.024	52.63	1.839s
K-40	2926.96	1463.03	5.	109.	0.055	29.86	2.042

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Code	MDA Value pCi/gm	COMMENTS
BE-7		7.1339E-02					
			477.56	7.134E-02	%(	3.889E-01 1.11E-01	G
K-40		3.9444E+00					
			1460.75	3.944E+00	(P	4.591E-01 3.93E-01	G
MN-54		-3.3633E-04					
			834.81	-3.363E-04	%(P	4.250E-02 1.08E-02	G
CO-57		-6.4324E-03					
			122.07	-6.432E-03	%(	5.350E-02 1.58E-02	G K
			136.43	-1.318E-01	&	4.129E-01 1.24E-01	G
CO-60		1.0653E-02					
			1332.51	1.065E-02	&(P	5.218E-02 1.43E-02	G K
			1173.23	8.034E-03	&	6.314E-02 1.73E-02	G K

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
Sr-85	-1.2749E-02						
		514.00	-1.275E-02	&(	6.710E-02	1.96E-02	G
Kr-85	-2.8811E+02						
		513.99	-2.881E+02	&(	1.516E+03	4.43E+02	G
Y-88	-5.9985E-03						
		1836.01	-5.998E-03	%(P	6.253E-02	1.59E-02	G K
		898.02	-1.156E-03	% P	5.406E-02	1.39E-02	G
NB-94	-2.4175E-03						
		871.10	-2.417E-03	&(	5.513E-02	1.49E-02	G K
		702.50	0.000E+00	%	4.062E-02	1.06E-02	G K
Ag-108M	7.8897E-03						
		722.95	7.890E-03	%(	4.768E-02	1.33E-02	G K
		614.37	-1.790E-02	% P	6.211E-02	1.82E-02	G
		433.93	4.258E-03	&	3.826E-02	1.07E-02	G
CD-109	-2.2682E-02						
		88.04	-2.268E-02	&(P	2.234E+00	6.59E-01	G
SN-113	-9.2465E-03						
		391.71	-9.246E-03	%(	5.647E-02	1.62E-02	G K
		255.04	-3.725E-01	%	1.652E+00	4.85E-01	G
SB-125	2.3764E-02						
		427.95	2.376E-02	%(P	1.293E-01	3.68E-02	G K
		600.77	2.359E-02	% P	2.494E-01	6.93E-02	G
		636.15	-5.151E-02	% P	3.908E-01	1.09E-01	G
		463.51	1.222E-01	% P	3.832E-01	1.11E-01	G
		176.29	6.510E-02	% P	5.884E-01	1.72E-01	G
I-131	0.0000E+00						
		364.48	0.000E+00	%(	4.811E-02	1.33E-02	G K
		636.97	-1.216E-01	%	6.941E-01	1.95E-01	G
		284.29	-7.286E-02	%	6.451E-01	1.85E-01	G
CS-134	1.3098E-04						
		604.66	1.310E-04	%(	3.965E-02	1.05E-02	G K
		795.76	1.046E-02	%	5.810E-02	1.63E-02	G
		569.29	1.327E-03	%	2.816E-01	7.66E-02	G
		801.84	-1.346E-03	% P	4.801E-01	1.24E-01	G
CS-137	-5.4657E-03						
		661.62	-5.466E-03	&(	4.783E-02	1.31E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CE-139	8.3457E-04						
		165.85	8.346E-04	%(P	4.197E-02	1.21E-02	G
EU-152	1.0745E-02						
		121.78	1.075E-02	&(P	1.501E-01	4.41E-02	G K
		344.30	3.329E-02	%	1.082E-01	3.18E-02	G
		1408.08	4.786E-02	%	2.378E-01	6.46E-02	G
		964.00	-1.169E-02	% P	4.048E-01	1.07E-01	G
		1112.07	-5.764E-02	&	4.791E-01	1.32E-01	G
		778.90	2.440E-02	% P	3.243E-01	8.65E-02	G
EU-154	1.5035E-02						
		123.10	1.503E-02	%(P	1.000E-01	2.95E-02	G K
		1274.80	2.223E-02	%	1.594E-01	4.30E-02	G
		723.30	2.781E-02	% P	2.370E-01	6.52E-02	G
		1004.80	-4.562E-02	%	3.609E-01	1.00E-01	G
EU-155	-5.6731E-02						
		86.45	-5.673E-02	%(P	2.084E-01	6.17E-02	G K
		105.31	-1.781E-02	%	2.224E-01	6.54E-02	G
HG-203	1.7452E-03						
		279.17	1.745E-03	%(P	4.373E-02	1.25E-02	G K
		72.87	-3.126E-01	&	2.231E+00	6.65E-01	G
		70.83	-1.238E+00	%	4.033E+00	1.21E+00	G
		82.50	-1.986E-01	&	4.098E+00	1.21E+00	G
TL-208	1.0526E-01						
		583.14	1.053E-01	(P	4.029E-02	1.79E-02	G
		510.72	1.990E-01	+	2.197E-01	7.12E-02	G
PB-212	1.8839E-01						
		238.63	1.884E-01	(	1.143E-01	3.78E-02	G K
							Energy duplication
		77.11	4.483E-01	%	6.120E-01	1.88E-01	G
		74.81	7.018E-01	& P	1.252E+00	3.81E-01	G
PB-214	5.9550E-01						
		351.99	5.746E-01	@(P	8.467E-02	4.65E-02	G K
		295.22	7.138E-01	+	1.664E-01	7.40E-02	G
							Energy duplication
		77.11	7.333E-01	%	1.001E+00	3.08E-01	G
		241.92	6.991E-01	&(	6.086E-01	1.95E-01	G
BI-212	4.7746E-03						
		727.17	4.775E-03	&(	3.932E-01	1.05E-01	G K
		1620.56	-5.164E-02	% P	1.134E+00	1.54E-01	G
		785.42	8.388E-01	% P	1.924E+00	5.79E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
BI-214	6.7797E-01						
		609.32	6.780E-01	(	8.319E-02	5.81E-02	G K
		1764.51	-2.482E-03	% P	2.111E-01	2.86E-02	G
		1120.28	1.003E+00	+	3.126E-01	1.76E-01	G
RA-224	1.3503E+00						
		241.00	1.350E+00	&(P	1.130E+00	3.64E-01	G
RA-226	1.1321E+00						
		185.99	1.132E+00	(P	1.193E+00	3.74E-01	G
AC-228	2.5074E-01						
		911.07	2.344E-01	*(P	1.600E-01	6.14E-02	G K
		968.90	-5.421E-04	& P	4.087E-01	1.11E-01	G
		338.40	2.903E-01	(	2.719E-01	9.03E-02	G
TH-227	3.5392E-02						
		236.00	3.539E-02	%(P	4.148E-01	1.21E-01	G K
		256.25	-1.487E-01	%	4.997E-01	1.48E-01	G
PA-234	6.7064E-02						
		98.44	6.706E-02	%(	2.482E-01	7.43E-02	G K
		946.00	0.000E+00	%	1.818E-01	4.42E-02	G
		131.28	-3.578E-02	%	2.131E-01	6.31E-02	G
		94.67	2.374E-01	&	4.247E-01	1.29E-01	G
		883.24	5.499E-02	%	4.176E-01	1.15E-01	G
		926.70	0.000E+00	%	6.024E-01	1.63E-01	G
		569.26	-3.368E-04	%	3.241E-01	8.51E-02	G
TH-234	1.3617E+00						
		63.29	1.362E+00	%(P	4.725E+00	1.42E+00	G K
		92.80	1.498E+00	&	2.425E+00	7.41E-01	G
		92.38	-1.935E-01	& P	2.757E+00	8.14E-01	G
AM-241	-2.1571E-01						
		59.54	-2.157E-01	%(	7.559E-01	2.27E-01	G

(- This peak used in the nuclide activity average.

* - Peak is too wide, but only one peak in library.
! - Peak is part of a multiplet and this area went negative during deconvolution.
? - Peak is too narrow.
@ - Peak is too wide at FW25M, but ok at FWHM.
% - Peak fails sensitivity test.
$ - Peak identified, but first peak of this nuclide failed one or more qualification tests.

+ - Peak activity higher than counting uncertainty range.
- - Peak activity lower than counting uncertainty range.
= - Peak outside analysis energy range.
& - Calculated peak centroid is not close enough to the library energy centroid for positive identification.
P - Peakbackground subtraction
} - Peak is too close to another for the activity to be found directly.

Nuclide Codes:
T - Thermal Neutron Activation
F - Fast Neutron Activation
I - Fission Product
N - Naturally Occurring Isotope
P - Photon Reaction
C - Charged Particle Reaction
M - No MDA Calculation
R - Coincidence Corrected
H - Halflife limit exceeded

Peak Codes:
G - Gamma Ray
X - X-Ray
P - Positron Decay
S - Single-Escape
D - Double-Escape
K - Key Line
A - Not in Average
C - Coincidence Peak

- -

***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	6.9513E-02	7.1339E-02	3.3312E-01	3.3315E-01	3.790E-01
K-40		3.9444E+00	3.9444E+00	1.1793E+00	1.1998E+00	4.591E-01
MN-54	#A	-3.3484E-04	-3.3633E-04	1.5583E-01	1.5583E-01	4.232E-02
CO-57	#B	-6.3995E-03	-6.4324E-03	4.7394E-02	4.7395E-02	5.322E-02
CO-60	#B	1.0645E-02	1.0653E-02	4.2777E-02	4.2781E-02	5.215E-02
Sr-85	#A	-1.2480E-02	-1.2749E-02	5.8768E-02	5.8772E-02	6.568E-02
Kr-85	#A	-2.8811E+02	-2.8811E+02	1.3281E+03	1.3281E+03	1.516E+03
Y-88	#B	-5.9211E-03	-5.9985E-03	4.8313E-02	4.8314E-02	6.172E-02
NB-94	#B	-2.4175E-03	-2.4175E-03	4.4669E-02	4.4669E-02	5.513E-02
Ag-108M	#B	7.8894E-03	7.8897E-03	3.9802E-02	3.9804E-02	4.768E-02
CD-109	#A	-2.2613E-02	-2.2682E-02	1.1313E+01	1.1313E+01	2.227E+00
SN-113	#B	-9.1359E-03	-9.2465E-03	4.8480E-02	4.8483E-02	5.579E-02
SB-125	#B	2.3731E-02	2.3764E-02	1.1052E-01	1.1053E-01	1.291E-01
I-131	#B	0.0000E+00	0.0000E+00	3.9891E-02	3.9891E-02	4.050E-02
CS-134	#B	1.3074E-04	1.3098E-04	3.1614E-02	3.1614E-02	3.957E-02
CS-137	#A	-5.4650E-03	-5.4657E-03	3.9348E-02	3.9349E-02	4.782E-02
CE-139	#A	8.2621E-04	8.3457E-04	3.6406E-02	3.6406E-02	4.155E-02
EU-152	#B	1.0742E-02	1.0745E-02	1.3219E-01	1.3219E-01	1.501E-01
EU-154	#B	1.5028E-02	1.5035E-02	8.8540E-02	8.8544E-02	1.000E-01
EU-155	#B	-5.6687E-02	-5.6731E-02	2.6311E-01	2.6313E-01	2.083E-01
HG-203	#B	1.6941E-03	1.7452E-03	3.7399E-02	3.7399E-02	4.245E-02
TL-208	#	1.0526E-01	1.0526E-01	5.3762E-02	5.4086E-02	4.029E-02
PB-212	#	1.8839E-01	1.8839E-01	1.1340E-01	1.1389E-01	1.143E-01
PB-214	#	5.9550E-01	5.9550E-01	1.4471E-01	1.4852E-01	8.467E-02
BI-212	#B	4.7746E-03	4.7746E-03	3.1497E-01	3.1497E-01	3.932E-01

BI-214	6.7797E-01	6.7797E-01	1.7417E-01	1.7827E-01

RA-224	#	1.3503E+00	1.3503E+00	1.0912E+00	1.0939E+00	1.130E+00
RA-226	#A	1.1321E+00	1.1321E+00	1.1222E+00	1.1240E+00	1.193E+00
AC-228	#	2.5074E-01	2.5074E-01	1.5298E-01	1.5362E-01	1.600E-01
TH-227	#B	3.5392E-02	3.5392E-02	3.6433E-01	3.6433E-01	4.148E-01
PA-234	#B	6.7064E-02	6.7064E-02	2.2289E-01	2.2292E-01	2.482E-01
TH-234	#B	1.3617E+00	1.3617E+00	4.2463E+00	4.2469E+00	4.725E+00
AM-241	#A	-2.1571E-01	-2.1571E-01	6.7988E-01	6.7999E-01	7.559E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (295.2 to 1999.0 keV) 4.6223979E+00 pCi/gm
Total Decayed Activity (295.2 to 1999.0 keV) 4.6223979E+00 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JPK

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 102F_12SEPT2006_1059.An1

Sample description
FSS-OOL-05-10-003-F

Spectrum Filename: C:\GammaVision\Spectra\102F_12SEPT2006_1059.An1

Acquisition information
Start time: 12-Sep-2006 11:01:01
Live time: 2000
Real time: 2019
Dead time: 0.92 %
Detector ID: 3

Detector system
Det 102 - DSPP-468

Calibration
Filename: D2_1LSa.Clb
DET 102 1 Liter Sand Geometry

Energy Calibration
Created: 15-Jan-2005 03:09:29
Zero offset: 0.220 keV
Gain: 0.500 keV/channel
Quadratic: -6.435E-08 keV/channel^2

Efficiency Calibration
Created: 15-Jan-2005 06:48:10
Type: Polynomial
Uncertainty: 0.497 %
Coefficients: -0.294180 -5.980622 0.744607
-0.096737 0.005214 -0.000120

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.22keV)
Stop channel: 4000 (1999.02keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 1.7940E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.7940E+03) =
5.5741E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	09-Sep-2006 08:25:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	102_150K_28APR05.Pbc 01-May-2005 05:27:47
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 15 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.6932

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
74.82	98.	41.63	1.50	8.847E-03				
74.82	98.	41.63	1.50	8.847E-03	74.81	9.600	PBC<MDA	PB212
77.25	168.	24.21	1.50	9.541E-03	77.11	10.700	1.243E+00	PB214
					77.11	17.500	7.598E-01	PB212
77.25	168.	24.21	1.50	9.541E-03	77.11	10.700	1.243E+00	PB214
					77.11	17.500	7.598E-01	PB212
186.18	110.	25.63	1.47	1.626E-02	185.99	3.280	1.487E+00	RA226
239.08	576.	5.11	1.22	1.379E-02	238.63	43.100	7.291E-01	PB212
242.28	93.	21.48	1.22	1.364E-02	241.00	3.900	1.289E+00	RA224
					241.92	7.470	6.838E-01	PB214
277.52	67.	33.22	1.68	1.214E-02				
295.44	139.	17.92	1.24	1.146E-02	295.22	19.200	4.746E-01	PB214
329.01	44.	31.00	1.50	1.034E-02				
338.87	140.	19.05	0.96	1.005E-02	338.40	12.010	8.728E-01	AC228
352.49	216.	9.72	1.63	9.665E-03	351.99	37.100	4.523E-01	PB214
511.49	107.	20.37	1.73	6.685E-03	510.72	22.500	5.331E-01	TL208
584.05	169.	10.77	1.58	5.881E-03	583.14	86.000	2.507E-01	TL208
610.24	136.	12.77	1.50	5.641E-03	609.32	46.090	3.946E-01	BI214
796.37	24.	38.39	1.60	4.420E-03	795.76	85.400	PBC<MDA	CS134
912.75	137.	11.98	1.37	3.916E-03	911.07	29.000	9.032E-01	AC228
970.29	98.	13.85	1.97	3.713E-03	968.90	17.460	1.132E+00	AC228
1121.62	41.	23.58	1.60	3.283E-03	1120.28	15.040	6.255E-01	BI214
1240.20	42.	34.40	0.83	3.012E-03				
1463.11	476.	4.81	1.80	2.617E-03	1460.75	10.700	1.277E+01	K40

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
477.79	238.94	146.	576.	0.288	15.34	1.215	PB-212	D
484.18	242.14	151.	93.	0.046	64.43	1.217	PB-214	D
554.69	277.52	147.	73.	0.036	79.10	1.679	NP-239	s
657.70	329.01	71.	44.	0.022	92.99	1.496	LA-140	
1458.31	729.18	29.	48.	0.024	69.05	1.779	J-132	l
1941.35	970.29	20.	60.	0.030	49.72	1.719	AC-228	D
2480.96	1240.20	47.	42.	0.021	103.19	0.829	-	sM

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.
M - Peak is close to a library peak.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-214	153.80	77.11	747.	168.	0.084	72.62	1.500D
PB-212	153.80	77.11	747.	168.	0.084	72.62	1.500D
RA-226	372.33	186.36	378.	97.	0.049	86.10	1.500s
PB-212	477.82	239.10	336.	471.	0.235	21.54	1.500
PB-214	483.97	242.17	372.	78.	0.039	110.71	1.500
PB-214	591.17	295.76	152.	119.	0.059	51.93	1.500s
AC-228	677.37	338.85	168.	142.	0.071	56.83	0.972
PB-214	704.67	352.49	94.	214.	0.107	27.99	1.500s
TL-208	1022.70	511.46	94.	102.	0.051	59.94	1.722s
TL-208	1167.93	584.05	54.	169.	0.084	32.30	1.575
BI-214	1220.32	610.24	51.	136.	0.068	38.31	1.496s
CS-134	1592.75	796.37	32.	24.	0.012	115.16	1.601s
AC-228	1825.62	912.74	29.	131.	0.065	33.28	1.365
BI-214	2243.63	1121.62	21.	41.	0.021	70.75	1.598s
K-40	2927.18	1463.13	10.	453.	0.226	14.40	2.042

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	MDA Value pCi/gm	COMMENTS
BE-7		9.3450E-03					
			477.56	9.345E-03	%(	3.325E-01 9.27E-02	G
K-40		1.2158E+01					
			1460.75	1.216E+01	(P	4.644E-01 5.84E-01	G
MN-54		4.4720E-03					
			834.81	4.472E-03	%(P	5.100E-02 1.43E-02	G
CO-57		1.2636E-02					
			122.07	1.264E-02	%(	5.192E-02 1.55E-02	G K
			136.43	-1.482E-02	&	4.434E-01 1.31E-01	G
CO-60		7.7834E-03					
			1332.51	7.783E-03	%(P	5.045E-02 1.39E-02	G K
			1173.23	-9.845E-03	%	7.669E-02 2.19E-02	G K
Sr-85		-1.7232E-02					
			514.00	-1.723E-02	&(	6.610E-02 1.96E-02	G
Kr-85		-3.8483E+02					
			513.99	-3.848E+02	&(	1.476E+03 4.38E+02	G
Y-88		1.8852E-05					
			1836.01	1.885E-05	&(P	5.584E-02 1.40E-02	G K
			898.02	8.432E-03	% P	4.834E-02 1.35E-02	G
NB-94		-7.1639E-03					
			871.10	-7.164E-03	%(	5.907E-02 1.68E-02	G K
			702.50	-9.310E-06	&	4.806E-02 1.33E-02	G K
Ag-108M		2.4837E-04					
			722.95	2.484E-04	%(	4.912E-02 1.35E-02	G K
			614.37	-2.560E-02	& P	7.173E-02 2.14E-02	G
			433.93	6.398E-03	%	4.269E-02 1.24E-02	G
CD-109		8.6949E-01					
			88.04	8.695E-01	&(P	2.054E+00 6.21E-01	G
SN-113		1.4815E-02					
			391.71	1.481E-02	&(	6.576E-02 1.94E-02	G K
			255.04	-4.621E-01	&	1.971E+00 5.86E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	4.8185E-02						
		427.95	4.818E-02	%(P	1.268E-01	3.78E-02	G K
		600.77	5.117E-02	% P	2.150E-01	6.23E-02	G
		636.15	-6.554E-02	% P	4.272E-01	1.23E-01	G
		463.51	2.176E-01	% P	3.970E-01	1.21E-01	G
		176.29	1.665E-02	& P	6.903E-01	2.04E-01	G
I-131	1.1895E-02						
		364.48	1.190E-02	%(	5.225E-02	1.53E-02	G K
		636.97	-1.582E-01	%	9.419E-01	2.73E-01	G
		284.29	7.931E-02	&	8.146E-01	2.38E-01	G
CS-134	1.8703E-02						
		604.66	-7.715E-03	%(	4.797E-02	1.38E-02	G K
		795.76	4.889E-02	(	5.798E-02	1.88E-02	G
		569.29	-6.842E-02	%	3.121E-01	9.11E-02	G
		801.84	-1.120E-01	& P	6.635E-01	1.91E-01	G
CS-137	1.2663E-02						
		661.62	1.266E-02	%(	4.269E-02	1.25E-02	G
CE-139	-1.1730E-02						
		165.85	-1.173E-02	%(P	5.436E-02	1.62E-02	G
EU-152	3.5385E-02						
		121.78	3.538E-02	%(P	1.549E-01	4.63E-02	G K
		344.30	-2.324E-02	%	1.610E-01	4.73E-02	G
		1408.08	-3.590E-02	%	2.293E-01	6.27E-02	G
		964.00	-1.613E-02	% P	4.092E-01	1.13E-01	G
		1112.07	5.145E-02	%	4.911E-01	1.38E-01	G
		778.90	9.306E-02	% P	3.503E-01	1.02E-01	G
EU-154	-2.8124E-02						
		123.10	-2.812E-02	&(P	1.225E-01	3.67E-02	G K
		1274.80	-9.284E-03	%	1.910E-01	5.27E-02	G
		723.30	-1.366E-03	% P	2.463E-01	6.80E-02	G
		1004.80	1.648E-03	%	3.499E-01	9.65E-02	G
EU-155	7.2500E-02						
		86.45	7.250E-02	%(P	2.581E-01	7.76E-02	G K
		105.31	4.790E-02	%	2.551E-01	7.63E-02	G
HG-203	-4.6346E-03						
		279.17	-4.635E-03	&(P	5.305E-02	1.56E-02	G K
		72.87	-6.375E-01	&	2.229E+00	6.71E-01	G
		70.83	-1.646E+00	%	3.938E+00	1.19E+00	G
		82.50	3.370E-02	%	3.909E+00	1.16E+00	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	2.5071E-01						
		583.14	2.507E-01	(P	5.514E-02	2.71E-02	G
		510.72	5.086E-01	+	2.398E-01	1.02E-01	G
PB-212	5.9605E-01						
		238.63	5.961E-01	(	1.116E-01	4.28E-02	G K
							Energy duplication
		77.11	7.598E-01	+	5.868E-01	1.84E-01	G
		74.81	8.704E-01	& P	1.222E+00	3.74E-01	G
PB-214	4.3473E-01						
		351.99	4.494E-01	(P	1.002E-01	4.20E-02	G K
		295.22	4.064E-01	@(	2.058E-01	7.03E-02	G
							Energy duplication
		77.11	1.243E+00	+	9.597E-01	3.01E-01	G
		241.92	5.740E-01	+	6.842E-01	2.12E-01	G
BI-212	-8.4455E-02						
		727.17	-8.445E-02	&(	4.453E-01	1.29E-01	G K
		1620.56	-3.834E-02	% P	8.422E-01	1.14E-01	G
		785.42	6.371E-01	% P	2.250E+00	6.56E-01	G
BI-214	3.9460E-01						
		609.32	3.946E-01	*(	1.037E-01	5.05E-02	G K
		1764.51	-5.666E-02	% P	3.623E-01	9.82E-02	G
		1120.28	6.255E-01	+	3.671E-01	1.48E-01	G
RA-224	6.3807E-01						
		241.00	6.381E-01	&(P	1.288E+00	3.91E-01	G
RA-226	1.3705E+00						
		185.99	1.370E+00	(P	1.318E+00	4.11E-01	G
AC-228	8.7357E-01						
		911.07	8.674E-01	(P	1.842E-01	9.64E-02	G K
		968.90	1.375E-02	% P	2.938E-01	8.06E-02	G
		338.40	8.884E-01	(	3.929E-01	1.69E-01	G
TH-227	-1.2777E-01						
		236.00	-1.278E-01	&(P	4.568E-01	1.37E-01	G K
		256.25	-1.911E-03	%	5.683E-01	1.66E-01	G
PA-234	-8.7955E-02						
		98.44	-8.795E-02	&(	2.434E-01	7.34E-02	G K
		946.00	-2.165E-02	%	2.675E-01	7.45E-02	G
		131.28	-2.328E-03	&	2.470E-01	7.32E-02	G
		94.67	2.917E-01	%	4.261E-01	1.30E-01	G
		883.24	-4.595E-03	%	4.285E-01	1.18E-01	G
		926.70	3.498E-02	&	4.281E-01	1.18E-01	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26-1.014E-01 %   4.618E-01 1.35E-01 G

TH-234       1.2957E+00
                           63.29 1.296E+00 &(P 4.489E+00 1.35E+00 G K
                           92.80 1.493E+00 %   2.488E+00 7.58E-01 G
                           92.38-2.597E-02 & P 2.930E+00 8.70E-01 G

AM-241      -1.2877E-01
                           59.54-1.288E-01 %(  6.702E-01 2.00E-01 G
   ( - This peak used in the nuclide activity average.

   * - Peak is too wide, but only one peak in library.
   ! - Peak is part of a multiplet and this area went
       negative during deconvolution.
   ? - Peak is too narrow.
   @ - Peak is too wide at FW25M, but ok at FWHM.
   % - Peak fails sensitivity test.
   $ - Peak identified, but first peak of this nuclide
       failed one or more qualification tests.
   + - Peak activity higher than counting uncertainty range.
   - - Peak activity lower than counting uncertainty range.
   = - Peak outside analysis energy range.
   & - Calculated peak centroid is not close enough to the
       library energy centroid for positive identification.
   P - Peakbackground subtraction
   } - Peak is too close to another for the activity
       to be found directly.

   Nuclide Codes:                      Peak Codes:
   T - Thermal Neutron Activation      G - Gamma Ray
   F - Fast Neutron Activation         X - X-Ray
   I - Fission Product                 P - Positron Decay
   N - Naturally Occurring Isotope     S - Single-Escape
   P - Photon Reaction                 D - Double-Escape
   C - Charged Particle Reaction       K - Key Line
   M - No MDA Calculation              A - Not in Average
   R - Coincidence Corrected           C - Coincidence Peak
   H - Halflife limit exceeded

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
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***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	8.9755E-03	9.3450E-03	2.7807E-01	2.7807E-01	3.194E-01
K-40		1.2158E+01	1.2158E+01	1.7509E+00	1.8791E+00	4.644E-01
MN-54	#A	4.4412E-03	4.4720E-03	4.2787E-02	4.2788E-02	5.065E-02
CO-57	#B	1.2536E-02	1.2636E-02	4.6619E-02	4.6625E-02	5.151E-02
CO-60	#B	7.7747E-03	7.7834E-03	4.1606E-02	4.1609E-02	5.039E-02

Sr-85	#A	-1.6669E-02	-1.7232E-02	5.8844E-02	5.8852E-02	6.394E-02
Kr-85	#A	-3.8482E+02	-3.8483E+02	1.3141E+03	1.3143E+03	1.476E+03
Y-88	#B	1.8475E-05	1.8852E-05	4.1954E-02	4.1954E-02	5.472E-02
NB-94	#B	-7.1639E-03	-7.1639E-03	5.0421E-02	5.0423E-02	5.907E-02
Ag-108M	#B	2.4836E-04	2.4837E-04	4.0503E-02	4.0503E-02	4.911E-02
CD-109	#A	8.6536E-01	8.6949E-01	1.8632E+00	1.8638E+00	2.044E+00
SN-113	#B	1.4540E-02	1.4815E-02	5.8076E-02	5.8082E-02	6.454E-02
SB-125	#B	4.8082E-02	4.8185E-02	1.1339E-01	1.1343E-01	1.265E-01
I-131	#B	9.0988E-03	1.1895E-02	4.5905E-02	4.5910E-02	3.996E-02
CS-134	#B	1.8649E-02	1.8703E-02	2.1538E-02	2.1564E-02	4.783E-02
CS-137	#A	1.2660E-02	1.2663E-02	3.7356E-02	3.7363E-02	4.268E-02
CE-139	#A	-1.1548E-02	-1.1730E-02	5.0766E-02	5.0770E-02	5.352E-02
EU-152	#B	3.5368E-02	3.5385E-02	1.3895E-01	1.3897E-01	1.548E-01
EU-154	#B	-2.8104E-02	-2.8124E-02	1.1180E-01	1.1181E-01	1.224E-01
EU-155	#B	7.2414E-02	7.2500E-02	2.3267E-01	2.3270E-01	2.578E-01
HG-203	#B	-4.4252E-03	-4.6346E-03	4.8186E-02	4.8187E-02	5.066E-02
TL-208		2.5071E-01	2.5071E-01	8.1165E-02	8.2375E-02	
PB-212	#	5.9605E-01	5.9605E-01	1.2840E-01	1.3269E-01	1.116E-01
PB-214	#	4.3473E-01	4.3473E-01	1.2191E-01	1.2432E-01	1.002E-01
BI-212	#B	-8.4455E-02	-8.4455E-02	3.8591E-01	3.8594E-01	4.453E-01
BI-214	#	3.9460E-01	3.9460E-01	1.5117E-01	1.5278E-01	
RA-224	#A	6.3807E-01	6.3807E-01	1.1721E+00	1.1726E+00	1.288E+00
RA-226	#	1.3705E+00	1.3705E+00	1.2342E+00	1.2366E+00	1.318E+00
AC-228		8.7357E-01	8.7357E-01	2.8779E-01	2.9194E-01	
TH-227	#B	-1.2777E-01	-1.2777E-01	4.1954E-01	4.1961E-01	4.568E-01
PA-234	#B	-8.7955E-02	-8.7955E-02	2.2026E-01	2.2032E-01	2.434E-01
TH-234	#B	1.2957E+00	1.2957E+00	4.0456E+00	4.0462E+00	4.489E+00
AM-241	#A	-1.2877E-01	-1.2877E-01	6.0125E-01	6.0129E-01	6.702E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (1119.8 to 1999.0 keV) 1.3677305E+01 pCi/gm
Total Decayed Activity (1119.8 to 1999.0 keV) 1.3677305E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JPK

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 102F_12SEPT2006_1138.An1

Sample description
FSS-OOL-05-10-017-F

Spectrum Filename: C:\GammaVision\Spectra\102F_12SEPT2006_1138.An1

Acquisition information

Start time:	12-Sep-2006 11:39:12
Live time:	2000
Real time:	2015
Dead time:	0.73 %
Detector ID:	3

Detector system
Det 102 - DSPP-468

Calibration
Filename: D2_1LSa.Clb
DET 102 1 Liter Sand Geometry

Energy Calibration

Created:	15-Jan-2005 03:09:29
Zero offset:	0.220 keV
Gain:	0.500 keV/channel
Quadratic:	-6.435E-08 keV/channel^2

Efficiency Calibration

Created:	15-Jan-2005 06:48:10
Type:	Polynomial
Uncertainty:	0.497 %
Coefficients:	-0.294180 -5.980622 0.744607
	-0.096737 0.005214 -0.000120

Library Files

Main analysis library:	FSS_Rev_1.Lib
Library Match Width:	1.000
Peak stripping:	Library based

Analysis parameters

Analysis engine:	Env32 G53W4.20
Start channel:	100 (50.22keV)
Stop channel:	4000 (1999.02keV)
Peak rejection level:	41.667%
Peak search sensitivity:	3
Sample Size:	1.8260E+03
Activity scaling factor:	1.0000E+06/(1.0000E+00* 1.8260E+03) = 5.4765E+02
Detection limit method:	Nureg 4.16
Random error:	1.0000000E+00
Systematic error:	1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

YAEC Chemistry Lab Spectrum name: 102F_12SEPT2006_1138.An1

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	09-Sep-2006 13:43:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	102_150K_28APR05.Pbc 01-May-2005 05:27:47
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 11 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.6200

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
77.31	99.	38.26	1.50	9.541E-03	77.11	10.700	PBC<MDA	PB214
					77.11	17.500	4.375E-01	PB212
77.31	99.	38.26	1.50	9.541E-03	77.11	10.700	7.155E-01	PB214
					77.11	17.500	4.375E-01	PB212
186.02	117.	25.65	1.75	1.626E-02	185.99	3.280	1.565E+00	RA226
239.04	345.	6.47	1.22	1.378E-02	238.63	43.100	4.293E-01	PB212
242.40	100.	18.64	1.22	1.363E-02	241.00	3.900	1.370E+00	RA224
					241.92	7.470	7.260E-01	PB214
270.54	37.	38.70	1.15	1.242E-02				
295.59	152.	13.50	1.00	1.145E-02	295.22	19.200	5.097E-01	PB214
339.00	82.	20.84	1.30	1.004E-02	338.40	12.010	5.023E-01	AC228
352.64	192.	9.87	1.25	9.661E-03	351.99	37.100	3.953E-01	PB214
511.15	80.	19.03	1.33	6.689E-03	510.72	22.500	3.930E-01	TL208
584.36	115.	13.83	1.58	5.878E-03	583.14	86.000	1.668E-01	TL208
610.38	168.	9.37	1.64	5.640E-03	609.32	46.090	4.761E-01	BI214
728.38	46.	24.88	1.25	4.787E-03	727.17	11.800	5.952E-01	BI212
912.88	91.	15.74	2.01	3.915E-03	911.07	29.000	5.913E-01	AC228
970.49	37.	23.20	1.72	3.718E-03	968.90	17.460	4.177E-01	AC228
1121.75	49.	20.10	0.90	3.279E-03				
1463.20	264.	6.32	1.75	2.617E-03				

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
477.71	239.12	77.	345.	0.173	19.42	1.215	PB-212	D

484.44	242.48	124.	100.	0.050	55.93	1.217	XE-138	D
540.72	270.54	84.	37.	0.019	116.09	1.151	AC-228	M

Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM	Suspected	
1022.09	511.15	37.	89.	0.045	42.84	1.333	TL-208	s
2244.53	1121.75	18.	35.	0.018	71.90	1.820	TA-182	D
2927.31	1463.20	2.	265.	0.133	18.55	1.750	K-40	M

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.
M - Peak is close to a library peak.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-214	153.80	77.11	664.	99.	0.049	114.79	1.500D
PB-212	153.80	77.11	664.	99.	0.049	114.79	1.500D
RA-226	372.13	186.26	290.	65.	0.033	108.56	1.500s
PB-212	477.72	239.04	241.	313.	0.156	27.01	1.500
RA-224	484.52	242.45	212.	97.	0.048	69.87	1.500
PB-214	484.53	242.45	236.	92.	0.046	77.40	1.500
PB-214	591.34	295.84	68.	136.	0.068	36.26	1.500s
AC-228	677.82	339.07	83.	76.	0.038	61.34	1.500
PB-214	704.89	352.60	78.	190.	0.095	29.24	1.500
TL-208	1168.42	584.29	31.	98.	0.049	38.63	1.499
BI-214	1220.61	610.38	32.	168.	0.084	28.11	1.639s
BI-212	1456.71	728.38	28.	46.	0.023	74.64	1.248
AC-228	1825.29	912.58	23.	63.	0.031	49.39	1.679
AC-228	1941.19	970.49	18.	37.	0.018	69.60	1.718

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Code	MDA Value pCi/gm	COMMENTS
BE-7		4.7185E-03					
			477.56	4.718E-03	&(	3.340E-01	9.30E-02 G
K-40		-4.2265E-02					
			1460.75	-4.226E-02	%(P	4.226E-01	1.10E-01 G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
MN-54	-6.3354E-05						
		834.81	-6.335E-05	%(P	4.031E-02	1.08E-02	G
CO-57	-1.6394E-02						
		122.07	-1.639E-02	%(	5.078E-02	1.53E-02	G K
		136.43	2.821E-02	%	3.892E-01	1.15E-01	G
CO-60	-5.2316E-03						
		1332.51	-5.232E-03	&(P	5.319E-02	1.44E-02	G K
		1173.23	2.377E-02	%	5.189E-02	1.57E-02	G K
Sr-85	-1.9819E-04						
		514.00	-1.982E-04	&(	4.448E-02	1.26E-02	G
Kr-85	-3.7423E+02						
		513.99	-3.742E+02	&(	1.172E+03	3.49E+02	G
Y-88	-7.6186E-03						
		1836.01	-7.619E-03	%(P	5.520E-02	1.48E-02	G K
		898.02	-6.101E-04	& P	4.836E-02	1.29E-02	G
NB-94	6.3555E-03						
		871.10	6.355E-03	%(	4.225E-02	1.18E-02	G K
		702.50	6.627E-03	%	3.942E-02	1.12E-02	G K
Ag-108M	-1.1438E-03						
		722.95	-1.144E-03	%(	4.234E-02	1.15E-02	G K
		614.37	-2.453E-02	% P	6.135E-02	1.84E-02	G
		433.93	-6.856E-03	%	3.311E-02	9.57E-03	G
CD-109	9.4774E-02						
		88.04	9.477E-02	%(P	2.138E+00	6.37E-01	G
SN-113	4.8771E-04						
		391.71	4.877E-04	&(	5.962E-02	1.70E-02	G K
		255.04	1.075E-01	%	1.551E+00	4.51E-01	G
SB-125	2.0418E-02						
		427.95	2.042E-02	%(P	1.160E-01	3.34E-02	G K
		600.77	5.690E-02	% P	2.232E-01	6.51E-02	G
		636.15	7.956E-02	% P	2.637E-01	7.66E-02	G
		463.51	1.919E-01	% P	3.311E-01	1.01E-01	G
		176.29	8.820E-02	% P	5.623E-01	1.66E-01	G
I-131	1.9849E-03						
		364.48	1.985E-03	&(	4.618E-02	1.31E-02	G K
		636.97	1.661E-01	%	4.978E-01	1.46E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
		284.29	-9.690E-02	%	6.988E-01	2.04E-01	G
CS-134	1.9596E-04						
		604.66	1.960E-04	%(	4.798E-02	1.35E-02	G K
		795.76	1.853E-02	%	5.129E-02	1.52E-02	G
		569.29	1.259E-02	%	2.307E-01	6.43E-02	G
		801.84	-6.655E-03	% P	5.230E-01	1.43E-01	G
CS-137	-1.2374E-02						
		661.62	-1.237E-02	%(	4.632E-02	1.35E-02	G
CE-139	-1.2736E-02						
		165.85	-1.274E-02	%(P	4.897E-02	1.46E-02	G
EU-152	-4.8036E-02						
		121.78	-4.804E-02	%(P	1.512E-01	4.54E-02	G K
		344.30	1.641E-02	%	1.373E-01	4.00E-02	G
		1408.08	-8.490E-02	%	3.117E-01	9.03E-02	G
		964.00	-4.329E-02	& P	3.571E-01	9.95E-02	G
		1112.07	-5.303E-02	%	3.937E-01	1.10E-01	G
		778.90	-4.806E-02	% P	3.241E-01	9.11E-02	G
EU-154	-5.8198E-03						
		123.10	-5.820E-03	%(P	1.048E-01	3.10E-02	G K
		1274.80	9.946E-03	&	1.679E-01	4.59E-02	G
		723.30	1.482E-02	% P	2.274E-01	6.34E-02	G
		1004.80	-1.174E-03	%	2.389E-01	6.30E-02	G
EU-155	-9.2138E-03						
		86.45	-9.214E-03	&(P	2.619E-01	7.78E-02	G K
		105.31	3.866E-02	%	2.311E-01	6.89E-02	G
HG-203	2.5105E-02						
		279.17	2.510E-02	%(P	4.255E-02	1.30E-02	G K
		72.87	-5.037E-01	&	1.946E+00	5.85E-01	G
		70.83	-1.712E-03	%	3.297E+00	9.77E-01	G
		82.50	2.044E-02	&	3.885E+00	1.15E+00	G
TL-208	1.4281E-01						
		583.14	1.428E-01	(P	4.199E-02	1.85E-02	G
		510.72	1.046E-02	%	2.156E-01	6.18E-02	G
PB-212	4.0318E-01						
		238.63	3.893E-01	(	9.327E-02	3.51E-02	G K
							Energy duplication
		77.11	4.375E-01	(	5.441E-01	1.67E-01	G
		74.81	6.308E-01	& P	1.083E+00	3.30E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
PB-214	4.1484E-01						
		351.99	3.923E-01	(P	9.032E-02	3.83E-02	G K
		295.22	4.583E-01	@(	1.379E-01	5.54E-02	G
							Energy duplication
		77.11	7.155E-01	+	8.899E-01	2.74E-01	G
		241.92	6.682E-01	&	5.394E-01	1.72E-01	G
BI-212	5.9524E-01						
		727.17	5.952E-01	(	3.609E-01	1.48E-01	G K
		1620.56	-2.901E-02	% P	1.665E+00	4.04E-01	G
		785.42	-2.943E-03	% P	1.907E+00	5.10E-01	G
BI-214	4.7608E-01						
		609.32	4.761E-01	*(	8.204E-02	4.47E-02	G K
		1764.51	-5.278E-03	% P	3.678E-01	9.44E-02	G
		1120.28	1.015E-01	%	3.890E-01	1.13E-01	G
RA-224	1.3404E+00						
		241.00	1.340E+00	&(P	9.781E-01	3.16E-01	G
RA-226	9.0786E-01						
		185.99	9.079E-01	*(P	1.137E+00	3.51E-01	G
AC-228	4.2290E-01						
		911.07	4.085E-01	(P	1.616E-01	6.75E-02	G K
		968.90	4.177E-01	(P	2.556E-01	9.70E-02	G
		338.40	4.653E-01	(	2.761E-01	9.51E-02	G
TH-227	-1.1455E-02						
		236.00	-1.146E-02	&(P	4.409E-01	1.30E-01	G K
		256.25	-3.309E-02	&	5.196E-01	1.52E-01	G
PA-234	6.4643E-02						
		98.44	6.464E-02	%(	1.804E-01	5.43E-02	G K
		946.00	-3.896E-03	%	2.315E-01	6.25E-02	G
		131.28	-1.885E-02	%	2.134E-01	6.33E-02	G
		94.67	-1.052E-01	&	4.392E-01	1.32E-01	G
		883.24	-5.680E-02	%	3.625E-01	1.02E-01	G
		926.70	1.839E-03	%	3.926E-01	1.05E-01	G
		569.26	1.350E-02	%	3.439E-01	9.55E-02	G
TH-234	1.7280E+00						
		63.29	1.728E+00	%(P	4.279E+00	1.29E+00	G K
		92.80	1.282E+00	&	2.230E+00	6.79E-01	G
		92.38	1.452E+00	& P	2.722E+00	8.27E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
AM-241	-6.2872E-02						
		59.54	-6.287E-02	&(	6.765E-01	2.01E-01	G

(- This peak used in the nuclide activity average.

* - Peak is too wide, but only one peak in library.
! - Peak is part of a multiplet and this area went negative during deconvolution.
? - Peak is too narrow.
@ - Peak is too wide at FW25M, but ok at FWHM.
% - Peak fails sensitivity test.
$ - Peak identified, but first peak of this nuclide failed one or more qualification tests.
+ - Peak activity higher than counting uncertainty range.
- - Peak activity lower than counting uncertainty range.
= - Peak outside analysis energy range.
& - Calculated peak centroid is not close enough to the library energy centroid for positive identification.
P - Peakbackground subtraction
} - Peak is too close to another for the activity to be found directly.

Nuclide Codes:
T - Thermal Neutron Activation
F - Fast Neutron Activation
I - Fission Product
N - Naturally Occurring Isotope
P - Photon Reaction
C - Charged Particle Reaction
M - No MDA Calculation
R - Coincidence Corrected
H - Halflife limit exceeded

Peak Codes:
G - Gamma Ray
X - X-Ray
P - Positron Decay
S - Single-Escape
D - Double-Escape
K - Key Line
A - Not in Average
C - Coincidence Peak

- -

***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	4.5433E-03	4.7185E-03	2.7910E-01	2.7910E-01	3.216E-01
K-40	#A	-4.2265E-02	-4.2265E-02	3.9965E-01	3.9966E-01	4.226E-01
MN-54	#A	-6.2945E-05	-6.3354E-05	4.5356E-02	4.5356E-02	4.005E-02
CO-57	#B	-1.6272E-02	-1.6394E-02	4.5797E-02	4.5806E-02	5.040E-02
CO-60	#B	-5.2262E-03	-5.2316E-03	4.6748E-02	4.6749E-02	5.313E-02
Sr-85	#A	-1.9212E-04	-1.9819E-04	3.7669E-02	3.7669E-02	4.311E-02
Kr-85	#A	-3.7422E+02	-3.7423E+02	1.0460E+03	1.0462E+03	1.172E+03
Y-88	#B	-7.4756E-03	-7.6186E-03	4.4603E-02	4.4605E-02	5.416E-02
NB-94	#B	6.3555E-03	6.3555E-03	3.5481E-02	3.5483E-02	4.225E-02
Ag-108M	#B	-1.1437E-03	-1.1438E-03	3.4618E-02	3.4618E-02	4.234E-02
CD-109	#A	9.4352E-02	9.4774E-02	1.9099E+00	1.9099E+00	2.128E+00

SN-113	#B	4.7923E-04	4.8771E-04	5.1014E-02	5.1014E-02	5.858E-02
SB-125	#B	2.0377E-02	2.0418E-02	1.0029E-01	1.0030E-01	1.157E-01
I-131	#B	1.5439E-03	1.9849E-03	3.9236E-02	3.9236E-02	3.592E-02
CS-134	#B	1.9544E-04	1.9596E-04	4.0415E-02	4.0415E-02	4.785E-02
CS-137	#A	-1.2372E-02	-1.2374E-02	4.0416E-02	4.0422E-02	4.631E-02
CE-139	#A	-1.2550E-02	-1.2736E-02	4.5600E-02	4.5606E-02	4.825E-02
EU-152	#B	-4.8016E-02	-4.8036E-02	1.4382E-01	1.4385E-01	1.511E-01
EU-154	#B	-5.8160E-03	-5.8198E-03	1.0042E-01	1.0042E-01	1.047E-01
EU-155	#B	-9.2036E-03	-9.2138E-03	1.9065E+00	1.9065E+00	2.616E-01
HG-203	#B	2.4040E-02	2.5105E-02	3.9134E-02	3.9160E-02	4.075E-02
TL-208	#	1.4281E-01	1.4281E-01	5.5395E-02	5.5972E-02	4.199E-02
PB-212	#	4.0318E-01	4.0318E-01	1.0891E-01	1.1124E-01	9.327E-02
PB-214	#	4.1484E-01	4.1484E-01	9.6697E-02	9.9460E-02	9.032E-02
BI-212		5.9524E-01	5.9524E-01	4.4429E-01	4.4554E-01	
BI-214	#	4.7608E-01	4.7608E-01	1.3381E-01	1.3645E-01	
RA-224	#	1.3404E+00	1.3404E+00	9.4782E-01	9.5080E-01	9.781E-01
RA-226	#A	9.0785E-01	9.0786E-01	1.0528E+00	1.0540E+00	1.137E+00
AC-228		4.2290E-01	4.2290E-01	1.4834E-01	1.5023E-01	1.616E-01
TH-227	#B	-1.1455E-02	-1.1455E-02	4.9468E-01	4.9468E-01	4.409E-01
PA-234	#B	6.4643E-02	6.4643E-02	1.6291E-01	1.6295E-01	1.804E-01
TH-234	#B	1.7280E+00	1.7280E+00	3.8782E+00	3.8794E+00	4.279E+00
AM-241	#A	-6.2871E-02	-6.2872E-02	6.0418E-01	6.0419E-01	6.765E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (1460.5 to 1999.0 keV) 1.4942234E+00 pCi/gm
Total Decayed Activity (1460.5 to 1999.0 keV) 1.4942234E+00 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JPK

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 102F_13SEPT2006_0823.An1

Sample description
FSS-OOL-05-10-009-F

Spectrum Filename: C:\GammaVision\Spectra\102F_13SEPT2006_0823.An1

Acquisition information
Start time: 13-Sep-2006 08:24:22
Live time: 2000
Real time: 2017
Dead time: 0.86 %
Detector ID: 3

Detector system
Det 102 - DSPP-468

Calibration
Filename: D2_1LSa.Clb
DET 102 1 Liter Sand Geometry

Energy Calibration
Created: 15-Jan-2005 03:09:29
Zero offset: 0.220 keV
Gain: 0.500 keV/channel
Quadratic: -6.435E-08 keV/channel^2

Efficiency Calibration
Created: 15-Jan-2005 06:48:10
Type: Polynomial
Uncertainty: 0.497 %
Coefficients: -0.294180 -5.980622 0.744607
-0.096737 0.005214 -0.000120

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.22keV)
Stop channel: 4000 (1999.02keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 1.9030E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.9030E+03) =
5.2549E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	09-Sep-2006 10:15:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	102_150K_28APR05.Pbc 01-May-2005 05:27:47
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 11 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.5947

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
77.16	188.	21.40	1.50	9.541E-03	77.11	10.700	1.307E+00	PB214
					77.11	17.500	7.990E-01	PB212
77.16	188.	21.40	1.50	9.541E-03	77.11	10.700	1.307E+00	PB214
					77.11	17.500	7.990E-01	PB212
186.42	127.	22.51	1.03	1.625E-02	185.99	3.280	1.631E+00	RA226
209.36	79.	37.14	0.84	1.519E-02				
239.03	472.	6.18	1.50	1.365E-02	238.63	43.100	5.632E-01	PB212
					241.92	7.470	3.286E+00	PB214
239.05	504.	5.33	1.22	1.379E-02	238.63	43.100	6.021E-01	PB212
					241.92	7.470	3.512E+00	PB214
242.18	109.	17.71	1.22	1.364E-02				
295.63	121.	12.79	1.25	1.145E-02	295.22	19.200	3.909E-01	PB214
300.85	42.	32.70	1.26	1.126E-02				
328.66	34.	40.80	1.18	1.035E-02				
339.24	113.	17.05	1.66	1.004E-02	338.40	12.010	6.642E-01	AC228
352.44	232.	10.17	1.19	9.666E-03	351.99	37.100	4.576E-01	PB214
463.76	44.	26.43	1.50	7.365E-03	463.51	10.000	4.217E-01	SB125
511.25	45.	30.86	1.50	6.695E-03	510.72	22.500	2.133E-01	TL208
584.07	158.	9.76	1.59	5.881E-03	583.14	86.000	2.215E-01	TL208
610.20	146.	11.66	1.38	5.642E-03	609.32	46.090	3.976E-01	BI214
728.55	24.	36.07	1.55	4.794E-03	727.17	11.800	PBC<MDA	BI212
796.24	25.	36.88	1.60	4.420E-03	795.76	85.400	PBC<MDA	CS134
912.66	126.	11.86	1.03	3.916E-03	911.07	29.000	7.865E-01	AC228
969.54	79.	18.97	1.87	3.716E-03	968.90	17.460	8.671E-01	AC228
1122.06	28.	31.80	1.82	3.283E-03	1120.28	15.040	3.959E-01	BI214
1462.73	370.	5.20	1.96	2.618E-03	1460.75	10.700	9.366E+00	K40
1766.73	30.	18.26	1.58	2.223E-03	1764.51	15.920	5.996E-01	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
418.33	209.36	287.	79.	0.039	111.42	0.840	AC-228	
477.73	239.04	110.	504.	0.252	16.00	1.215	PB-212	D
483.99	242.17	133.	109.	0.055	53.14	1.217	PB-214	D
601.35	300.85	107.	64.	0.032	87.02	1.273	PB-212	s
656.98	328.66	72.	34.	0.017	122.39	1.179	LA-140	s
1939.29	969.54	39.	78.	0.039	47.98	1.872	AC-228	s

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-214	153.80	77.11	714.	188.	0.094	64.20	1.500D
PB-212	153.80	77.11	714.	188.	0.094	64.20	1.500D
RA-226	371.88	186.13	339.	79.	0.039	98.79	1.500s
PB-212	477.65	239.01	359.	449.	0.224	22.85	1.500s
RA-224	483.85	242.11	378.	74.	0.037	114.23	1.500s
PB-214	477.69	239.03	190.	472.	0.236	18.55	1.500s
PB-214	591.00	295.67	110.	128.	0.064	43.87	1.500
AC-228	677.70	339.01	91.	83.	0.041	59.05	1.500s
PB-214	704.43	352.37	77.	195.	0.097	28.68	1.500s
SB-125	927.27	463.76	50.	44.	0.022	79.29	1.500s
TL-208	1022.28	511.25	75.	45.	0.023	92.57	1.499s
TL-208	1168.04	584.10	30.	159.	0.080	27.83	1.499
BI-214	1220.25	610.20	46.	146.	0.073	34.98	1.376
BI-212	1457.06	728.55	26.	24.	0.012	108.20	1.554
CS-134	1592.50	796.24	29.	25.	0.012	110.63	1.601
AC-228	1824.87	912.36	40.	88.	0.044	43.86	1.679s
BI-214	2244.53	1122.06	25.	28.	0.014	95.39	1.819s
K-40	2926.45	1462.77	7.	336.	0.168	16.72	2.042
BI-214	3535.62	1767.08	1.	21.	0.010	69.71	2.237s

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	Peak MDA Value pCi/gm	COMMENTS
BE-7		-1.8638E-03					
			477.56	-1.864E-03	%(	3.490E-01 9.77E-02	G
K-40		8.5061E+00					
			1460.75	8.506E+00	(P	3.914E-01 4.74E-01	G
MN-54		-7.1584E-03					
			834.81	-7.158E-03	%(P	4.800E-02 1.36E-02	G
CO-57		-5.8191E-03					
			122.07	-5.819E-03	&(	5.472E-02 1.63E-02	G K
			136.43	5.858E-02	%	3.961E-01 1.18E-01	G
CO-60		-1.0339E-02					
			1332.51	-1.034E-02	%(P	6.108E-02 1.72E-02	G K
			1173.23	5.159E-03	&	5.684E-02 1.58E-02	G K
Sr-85		-4.0228E-04					
			514.00	-4.023E-04	&(	5.385E-02 1.54E-02	G
Kr-85		-9.2417E+00					
			513.99	-9.242E+00	&(	1.192E+03 3.42E+02	G
Y-88		-2.2397E-05					
			1836.01	-2.240E-05	%(P	2.515E-02 3.41E-03	G K
			898.02	-2.349E-03	% P	4.822E-02 1.29E-02	G
NB-94		1.0738E-02					
			871.10	1.074E-02	%(	4.671E-02 1.35E-02	G K
			702.50	8.541E-03	&	3.864E-02 1.11E-02	G K
Ag-108M		-8.1110E-03					
			722.95	-8.111E-03	&(	6.029E-02 1.73E-02	G K
			614.37	-2.219E-02	% P	6.083E-02 1.82E-02	G
			433.93	1.930E-04	&	4.318E-02 1.23E-02	G
CD-109		-1.6892E-01					
			88.04	-1.689E-01	%(P	2.175E+00 6.49E-01	G
SN-113		9.0502E-03					
			391.71	9.050E-03	&(	5.190E-02 1.51E-02	G K
			255.04	4.383E-01	%	1.697E+00 5.05E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	1.2404E-01						
		427.95	2.348E-02	&(P	1.324E-01	3.85E-02	G K
		600.77	6.280E-02	% P	1.709E-01	5.06E-02	G
		636.15	9.493E-03	% P	3.323E-01	9.18E-02	G
		463.51	4.217E-01	*(P	3.454E-01	1.15E-01	G
		176.29	-3.014E-03	& P	6.678E-01	1.97E-01	G
I-131	-5.7939E-03						
		364.48	-5.794E-03	%(	5.848E-02	1.69E-02	G K
		636.97	-1.320E-01	%	7.988E-01	2.29E-01	G
		284.29	7.915E-02	%	7.649E-01	2.23E-01	G
CS-134	1.6875E-02						
		604.66	-9.256E-03	%(	4.728E-02	1.37E-02	G K
		795.76	4.674E-02	(	5.273E-02	1.72E-02	G
		569.29	7.045E-02	%	2.357E-01	6.92E-02	G
		801.84	8.839E-02	% P	4.675E-01	1.33E-01	G
CS-137	-2.9662E-03						
		661.62	-2.966E-03	&(	5.703E-02	1.61E-02	G
CE-139	7.4783E-03						
		165.85	7.478E-03	&(P	4.840E-02	1.44E-02	G
EU-152	-2.8067E-03						
		121.78	-2.807E-03	&(P	1.639E-01	4.85E-02	G K
		344.30	7.991E-04	%	1.306E-01	3.75E-02	G
		1408.08	-6.621E-03	%	2.917E-01	7.89E-02	G
		964.00	1.168E-01	% P	3.958E-01	1.16E-01	G
		1112.07	0.000E+00	&	4.900E-01	1.36E-01	G
		778.90	8.318E-02	% P	3.269E-01	9.47E-02	G
EU-154	1.9744E-02						
		123.10	1.974E-02	%(P	1.076E-01	3.21E-02	G K
		1274.80	-1.147E-02	%	1.700E-01	4.68E-02	G
		723.30	-5.110E-02	& P	2.897E-01	8.38E-02	G
		1004.80	-1.036E-02	&	2.951E-01	8.11E-02	G
EU-155	5.6057E-02						
		86.45	5.606E-02	%(P	2.047E-01	6.14E-02	G K
		105.31	3.494E-02	%	2.346E-01	7.00E-02	G
HG-203	-7.1998E-03						
		279.17	-7.200E-03	%(P	4.108E-02	1.21E-02	G K
		72.87	-4.100E-01	%	2.026E+00	6.08E-01	G
		70.83	-3.012E-02	&	3.979E+00	1.18E+00	G
		82.50	-2.685E-01	%	3.875E+00	1.15E+00	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	2.2096E-01						
		583.14	2.230E-01	(P	3.961E-02	2.07E-02	G
		510.72	2.133E-01	*(	2.028E-01	6.58E-02	G
PB-212	5.3529E-01						
		238.63	5.353E-01	@(	1.087E-01	4.08E-02	G K
							Energy duplication
		77.11	7.990E-01	+	5.412E-01	1.71E-01	G
		74.81	4.866E-01	& P	1.141E+00	3.45E-01	G
PB-214	3.9425E-01						
		351.99	3.853E-01	(P	8.617E-02	3.69E-02	G K
		295.22	4.116E-01	(	1.666E-01	6.02E-02	G
							Energy duplication
		77.11	1.307E+00	+	8.852E-01	2.80E-01	G
		241.92	3.286E+00	+	4.659E-01	2.03E-01	G
BI-212	3.0243E-01						
		727.17	3.024E-01	(	3.306E-01	1.09E-01	G K
		1620.56	-1.167E-01	& P	1.857E+00	4.76E-01	G
		785.42	1.323E-02	& P	2.242E+00	6.16E-01	G
BI-214	4.0066E-01						
		609.32	3.976E-01	(	9.378E-02	4.64E-02	G K
		1764.51	4.140E-01	?(P	1.620E-01	9.66E-02	G
		1120.28	3.959E-01	&(	3.710E-01	1.26E-01	G
RA-224	9.8999E-01						
		241.00	9.900E-01	&(P	1.240E+00	3.83E-01	G
RA-226	1.0491E+00						
		185.99	1.049E+00	(P	1.178E+00	3.65E-01	G
AC-228	5.3289E-01						
		911.07	5.524E-01	*(P	2.008E-01	8.10E-02	G K
		968.90	1.296E-02	% P	4.033E-01	1.14E-01	G
		338.40	4.858E-01	@(	2.772E-01	9.56E-02	G
TH-227	1.3240E-02						
		236.00	1.324E-02	%(P	5.099E-01	1.51E-01	G K
		256.25	1.466E-01	&	4.700E-01	1.40E-01	G
PA-234	3.5261E-02						
		98.44	3.526E-02	%(	2.466E-01	7.37E-02	G K
		946.00	7.787E-02	%	2.417E-01	7.10E-02	G
		131.28	1.802E-03	%	2.131E-01	6.30E-02	G
		94.67	-1.203E-01	%	4.310E-01	1.30E-01	G
		883.24	-4.277E-02	%	3.579E-01	9.97E-02	G
		926.70	-3.636E-02	&	4.739E-01	1.32E-01	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26 1.041E-01 %   3.484E-01 1.02E-01 G

TH-234       4.5134E-01
                           63.29 4.513E-01 &(P 4.212E+00 1.25E+00 G K
                           92.80 1.373E+00 &   2.276E+00 6.94E-01 G
                           92.38 1.540E+00 & P 2.707E+00 8.24E-01 G

AM-241       1.2072E-02
                           59.54 1.207E-02 &(  6.247E-01 1.85E-01 G
   ( - This peak used in the nuclide activity average.

   * - Peak is too wide, but only one peak in library.
   ! - Peak is part of a multiplet and this area went
       negative during deconvolution.
   ? - Peak is too narrow.
   @ - Peak is too wide at FW25M, but ok at FWHM.
   % - Peak fails sensitivity test.
   $ - Peak identified, but first peak of this nuclide
       failed one or more qualification tests.
   + - Peak activity higher than counting uncertainty range.
   - - Peak activity lower than counting uncertainty range.
   = - Peak outside analysis energy range.
   & - Calculated peak centroid is not close enough to the
       library energy centroid for positive identification.
   P - Peakbackground subtraction
   } - Peak is too close to another for the activity
       to be found directly.

   Nuclide Codes:                      Peak Codes:
   T - Thermal Neutron Activation      G - Gamma Ray
   F - Fast Neutron Activation         X - X-Ray
   I - Fission Product                 P - Positron Decay
   N - Naturally Occurring Isotope     S - Single-Escape
   P - Photon Reaction                 D - Double-Escape
   C - Charged Particle Reaction       K - Key Line
   M - No MDA Calculation              A - Not in Average
   R - Coincidence Corrected           C - Coincidence Peak
   H - Halflife limit exceeded

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
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***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	-1.7713E-03	-1.8638E-03	2.9302E-01	2.9302E-01	3.317E-01
K-40		8.5061E+00	8.5061E+00	1.4227E+00	1.5006E+00	3.914E-01
MN-54	#A	-7.0963E-03	-7.1584E-03	4.5003E-02	4.5005E-02	4.759E-02
CO-57	#B	-5.7608E-03	-5.8191E-03	4.8856E-02	4.8857E-02	5.417E-02
CO-60	#B	-1.0324E-02	-1.0339E-02	5.3583E-02	5.3586E-02	6.099E-02

Sr-85	#A	-3.8576E-04	-4.0228E-04	4.6304E-02	4.6304E-02	5.164E-02
Kr-85	#A	-9.2414E+00	-9.2417E+00	1.0252E+03	1.0252E+03	1.192E+03
Y-88	#B	-2.1833E-05	-2.2397E-05	1.3438E-04	1.3439E-04	2.452E-02
NB-94	#B	1.0738E-02	1.0738E-02	4.0373E-02	4.0377E-02	4.671E-02
Ag-108M	#B	-8.1105E-03	-8.1110E-03	5.2025E-02	5.2027E-02	6.028E-02
CD-109	#A	-1.6791E-01	-1.6892E-01	2.5498E+00	2.5498E+00	2.162E+00
SN-113	#B	8.8389E-03	9.0502E-03	4.5224E-02	4.5227E-02	5.068E-02
SB-125	#B	1.2371E-01	1.2404E-01	1.0184E-01	1.0208E-01	1.320E-01
I-131	#B	-4.1312E-03	-5.7939E-03	5.0685E-02	5.0686E-02	4.170E-02
CS-134	#B	1.6814E-02	1.6875E-02	1.8669E-02	1.8693E-02	4.711E-02
CS-137	#A	-2.9655E-03	-2.9662E-03	4.8405E-02	4.8405E-02	5.701E-02
CE-139	#A	7.3318E-03	7.4783E-03	4.3159E-02	4.3161E-02	4.745E-02
EU-152	#B	-2.8050E-03	-2.8067E-03	3.8561E-01	3.8561E-01	1.638E-01
EU-154	#B	1.9727E-02	1.9744E-02	9.6387E-02	9.6393E-02	1.075E-01
EU-155	#B	5.5973E-02	5.6057E-02	1.8406E-01	1.8409E-01	2.044E-01
HG-203	#B	-6.7916E-03	-7.1998E-03	3.6901E-02	3.6903E-02	3.875E-02
TL-208	#	2.2096E-01	2.2096E-01	6.1642E-02	6.2877E-02	3.961E-02
PB-212	#	5.3529E-01	5.3529E-01	1.2232E-01	1.2595E-01	1.087E-01
PB-214	#	3.9425E-01	3.9425E-01	1.0338E-01	1.0572E-01	8.617E-02
BI-212	#A	3.0243E-01	3.0243E-01	3.2724E-01	3.2767E-01	3.306E-01
BI-214		4.0066E-01	4.0066E-01	1.4016E-01	1.4195E-01	
RA-224	#A	9.8999E-01	9.8999E-01	1.1484E+00	1.1498E+00	1.240E+00
RA-226	#A	1.0491E+00	1.0491E+00	1.0950E+00	1.0966E+00	1.178E+00
AC-228	#	5.3289E-01	5.3289E-01	1.9616E-01	1.9842E-01	2.008E-01
TH-227	#B	1.3240E-02	1.3240E-02	4.5350E-01	4.5350E-01	5.099E-01
PA-234	#B	3.5261E-02	3.5261E-02	2.2108E-01	2.2109E-01	2.466E-01
TH-234	#B	4.5134E-01	4.5134E-01	3.7619E+00	3.7619E+00	4.212E+00
AM-241	#A	1.2072E-02	1.2072E-02	5.5539E-01	5.5539E-01	6.247E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (295.2 to 1999.0 keV) 8.9067659E+00 pCi/gm
Total Decayed Activity (295.2 to 1999.0 keV) 8.9067659E+00 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JPK

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 102F_13SEPT2006_0903.An1

Sample description
FSS-OOL-05-10-004-F

Spectrum Filename: C:\GammaVision\Spectra\102F_13SEPT2006_0903.An1

Acquisition information
Start time: 13-Sep-2006 09:03:49
Live time: 2000
Real time: 2017
Dead time: 0.84 %
Detector ID: 3

Detector system
Det 102 - DSPP-468

Calibration
Filename: D2_1LSa.Clb
DET 102 1 Liter Sand Geometry

Energy Calibration
Created: 15-Jan-2005 03:09:29
Zero offset: 0.220 keV
Gain: 0.500 keV/channel
Quadratic: -6.435E-08 keV/channel^2

Efficiency Calibration
Created: 15-Jan-2005 06:48:10
Type: Polynomial
Uncertainty: 0.497 %
Coefficients: -0.294180 -5.980622 0.744607
-0.096737 0.005214 -0.000120

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.22keV)
Stop channel: 4000 (1999.02keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 1.9200E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.9200E+03) =
5.2083E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	09-Sep-2006 08:36:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	102_150K_28APR05.Pbc 01-May-2005 05:27:47
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 13 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.5926

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
77.16	171.	22.60	1.50	9.541E-03	77.11	10.700	1.178E+00	PB214
					77.11	17.500	7.204E-01	PB212
77.16	171.	22.60	1.50	9.541E-03	77.11	10.700	1.178E+00	PB214
					77.11	17.500	7.204E-01	PB212
92.44	112.	34.04	1.53	1.326E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	1.980E+00	TH234
186.28	106.	28.06	0.96	1.625E-02	185.99	3.280	1.342E+00	RA226
238.98	389.	6.86	1.50	1.365E-02	238.63	43.100	4.598E-01	PB212
					241.92	7.470	2.682E+00	PB214
238.97	413.	6.18	1.21	1.379E-02	238.63	43.100	4.886E-01	PB212
					241.92	7.470	2.850E+00	PB214
242.16	100.	19.28	1.22	1.364E-02				
295.66	132.	16.16	1.25	1.145E-02	295.22	19.200	4.236E-01	PB214
338.90	130.	19.49	0.98	1.005E-02	338.40	12.010	7.602E-01	AC228
352.48	239.	8.46	1.33	9.665E-03	351.99	37.100	4.685E-01	PB214
511.05	94.	17.24	0.87	6.691E-03	510.72	22.500	4.369E-01	TL208
					513.99	0.004	2.300E+03	Kr85
					514.00	99.270	1.040E-01	Sr85
583.87	143.	13.67	1.48	5.883E-03	583.14	86.000	1.984E-01	TL208
610.16	187.	9.14	1.29	5.642E-03	609.32	46.090	5.060E-01	BI214
727.65	46.	30.47	1.47	4.794E-03	727.17	11.800	5.698E-01	BI212
796.03	24.	36.91	1.60	4.420E-03	795.76	85.400	PBC<MDA	CS134
912.59	92.	13.47	1.82	3.916E-03	911.07	29.000	5.654E-01	AC228
1121.24	49.	20.36	2.02	3.283E-03	1120.28	15.040	6.927E-01	BI214
1462.70	348.	5.43	1.99	2.618E-03	1460.75	10.700	8.718E+00	K40

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
477.57	239.01	119.	413.	0.207	18.53	1.215	PB-212	D
483.95	242.20	135.	100.	0.050	57.83	1.217	PB-214	D
2926.31	1462.70	7.	343.	0.172	16.52	1.992	K-40	M

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.
M - Peak is close to a library peak.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-214	153.80	77.11	661.	171.	0.085	67.80	1.500D
PB-212	153.80	77.11	661.	171.	0.085	67.80	1.500D
TH-234	185.84	93.13	647.	105.	0.052	106.07	1.500s
TH-234	185.79	93.10	626.	107.	0.053	103.45	1.500s
RA-226	372.17	186.28	305.	102.	0.051	84.19	0.963s
PB-212	477.59	238.98	340.	350.	0.175	27.50	1.500s
RA-224	484.17	242.27	315.	80.	0.040	98.95	1.500
PB-214	477.59	238.98	162.	389.	0.194	20.59	1.500
PB-214	590.80	295.57	141.	130.	0.065	46.87	1.500
AC-228	677.51	338.92	111.	77.	0.039	67.31	1.500
PB-214	704.61	352.47	59.	240.	0.120	23.65	1.500
TL-208	1021.89	511.05	48.	94.	0.047	51.71	0.873s
Kr-85	1022.85	511.53	52.	33.	0.017	104.66	1.500s
Sr-85	1022.77	511.50	34.	45.	0.022	71.29	1.499s
TL-208	1167.57	583.87	65.	143.	0.071	41.00	1.477s
BI-214	1220.17	610.16	38.	187.	0.094	27.43	1.290
Ag-108M	1224.13	612.14	144.	-55.	-0.027	102.10	1.499s
BI-212	1455.26	727.65	39.	46.	0.023	91.41	1.468s
CS-134	1592.09	796.03	26.	24.	0.012	110.73	1.601s
AC-228	1824.89	912.37	16.	73.	0.036	42.08	1.679
BI-214	2242.87	1121.24	15.	49.	0.024	61.07	2.022

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	MDA Value pCi/gm	COMMENTS
BE-7		-3.5069E-02					
			477.56	-3.507E-02	&(	3.446E-01 9.81E-02	G
K-40		1.0542E-01					
			1460.75	1.054E-01	%(P	2.449E-01 7.37E-02	G
MN-54		4.1011E-03					
			834.81	4.101E-03	%(P	4.763E-02 1.33E-02	G
CO-57		-9.8966E-04					
			122.07	-9.897E-04	%(	4.998E-02 1.48E-02	G K
			136.43	-3.991E-02	&	3.871E-01 1.15E-01	G
CO-60		6.7898E-03					
			1332.51	6.790E-03	%(P	5.426E-02 1.50E-02	G K
			1173.23	8.330E-03	&	6.380E-02 1.80E-02	G K
Sr-85		4.9861E-02					
			514.00	4.986E-02	?(	3.338E-02 1.18E-02	G
Kr-85		8.2389E+02					
			513.99	8.239E+02	?(	8.895E+02 2.87E+02	G
Y-88		-3.2275E-03					
			1836.01	-3.227E-03	%(P	3.892E-02 9.60E-03	G K
			898.02	-4.011E-03	% P	4.844E-02 1.31E-02	G
NB-94		-1.0574E-02					
			871.10	-1.057E-02	%(	4.627E-02 1.33E-02	G K
			702.50	-6.244E-03	%	3.864E-02 1.10E-02	G K
Ag-108M		-6.4724E-03					
			722.95	-6.472E-03	&(	5.041E-02 1.43E-02	G K
			614.37	-7.577E-02	& P	8.147E-02 2.57E-02	G
			433.93	1.143E-02	%	3.483E-02 1.03E-02	G
CD-109		6.3292E-03					
			88.04	6.329E-03	&(P	1.945E+00 5.77E-01	G
SN-113		-1.1946E-02					
			391.71	-1.195E-02	&(	5.740E-02 1.68E-02	G K
			255.04	-2.789E-01	%	1.757E+00 5.18E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	4.5465E-02						
		427.95	4.547E-02	%(P	1.029E-01	3.09E-02	G K
		600.77	-3.032E-03	% P	1.968E-01	5.42E-02	G
		636.15	-1.665E-02	& P	3.108E-01	8.57E-02	G
		463.51	1.532E-01	% P	4.191E-01	1.25E-01	G
		176.29	3.514E-02	& P	6.162E-01	1.82E-01	G
I-131	-4.0478E-03						
		364.48	-4.048E-03	%(	5.346E-02	1.53E-02	G K
		636.97	1.367E-01	%	7.481E-01	2.14E-01	G
		284.29	3.254E-01	%	6.927E-01	2.10E-01	G
CS-134	2.8831E-02						
		604.66	1.548E-02	%(	3.565E-02	1.07E-02	G K
		795.76	4.409E-02	@(	4.956E-02	1.63E-02	G
		569.29	3.499E-02	&	2.067E-01	5.88E-02	G
		801.84	2.007E-02	% P	6.535E-01	1.84E-01	G
CS-137	1.7046E-03						
		661.62	1.705E-03	%(	5.632E-02	1.59E-02	G
CE-139	-7.0888E-03						
		165.85	-7.089E-03	%(P	4.413E-02	1.31E-02	G
EU-152	2.1520E-02						
		121.78	2.152E-02	%(P	1.400E-01	4.17E-02	G K
		344.30	0.000E+00	%	1.452E-01	4.19E-02	G
		1408.08	2.661E-02	%	2.205E-01	5.96E-02	G
		964.00	-9.475E-02	% P	4.468E-01	1.29E-01	G
		1112.07	2.394E-02	%	3.532E-01	9.63E-02	G
		778.90	-5.044E-02	& P	3.083E-01	8.70E-02	G
EU-154	1.9837E-03						
		123.10	1.984E-03	%(P	1.143E-01	3.39E-02	G K
		1274.80	-1.747E-02	%	1.793E-01	5.01E-02	G
		723.30	-4.773E-02	& P	2.591E-01	7.47E-02	G
		1004.80	-4.812E-02	%	3.099E-01	8.80E-02	G
EU-155	6.8727E-02						
		86.45	6.873E-02	%(P	2.228E-01	6.70E-02	G K
		105.31	2.248E-03	&	2.321E-01	6.87E-02	G
HG-203	7.3812E-04						
		279.17	7.381E-04	&(P	4.713E-02	1.37E-02	G K
		72.87	-1.940E-01	&	1.870E+00	5.58E-01	G
		70.83	-8.599E-01	%	3.487E+00	1.05E+00	G
		82.50	6.989E-01	%	2.934E+00	8.78E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	1.9841E-01						
		583.14	1.984E-01	@(P	5.605E-02	2.72E-02	G
		510.72	4.369E-01	+	1.627E-01	7.54E-02	G
PB-212	4.1426E-01						
		238.63	4.143E-01	@(	1.049E-01	3.80E-02	G K
							Energy duplication
		77.11	7.204E-01	+	5.163E-01	1.63E-01	G
		74.81	5.645E-01	& P	1.094E+00	3.32E-01	G
PB-214	4.5104E-01						
		351.99	4.697E-01	(P	7.570E-02	3.71E-02	G K
		295.22	4.150E-01	(	1.854E-01	6.48E-02	G
							Energy duplication
		77.11	1.178E+00	+	8.444E-01	2.66E-01	G
		241.92	2.682E+00	&	4.274E-01	1.84E-01	G
BI-212	5.6983E-01						
		727.17	5.698E-01	@(	3.967E-01	1.74E-01	G K
		1620.56	-3.583E-02	% P	2.338E+00	6.16E-01	G
		785.42	1.769E-01	% P	1.893E+00	5.23E-01	G
BI-214	5.0603E-01						
		609.32	5.060E-01	(	8.477E-02	4.63E-02	G K
		1764.51	-1.722E-03	% P	1.464E-01	1.99E-02	G
		1120.28	6.927E-01	+	2.993E-01	1.41E-01	G
RA-224	1.0484E+00						
		241.00	1.048E+00	&(P	1.126E+00	3.51E-01	G
RA-226	1.3421E+00						
		185.99	1.342E+00	(P	1.110E+00	3.93E-01	G
AC-228	4.4956E-01						
		911.07	4.497E-01	(P	1.323E-01	6.33E-02	G K
		968.90	1.285E-02	% P	2.989E-01	8.26E-02	G
		338.40	4.492E-01	(	3.020E-01	1.01E-01	G
TH-227	-1.8830E-01						
		236.00	-1.883E-01	%(P	4.584E-01	1.38E-01	G K
		256.25	1.007E-01	%	5.075E-01	1.50E-01	G
PA-234	2.1114E-02						
		98.44	2.111E-02	%(	2.328E-01	6.93E-02	G K
		946.00	2.828E-02	&	2.475E-01	6.94E-02	G
		131.28	-2.744E-02	%	2.121E-01	6.31E-02	G
		94.67	-1.554E-01	%	4.204E-01	1.27E-01	G
		883.24	-4.687E-02	&	3.974E-01	1.12E-01	G
		926.70	1.104E-01	&	3.803E-01	1.10E-01	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26 8.412E-02 &   2.877E-01 8.39E-02 G

TH-234       1.4866E+00
                           63.29 7.389E-01 %(P 3.989E+00 1.19E+00 G K
                           92.80 1.881E+00 *(  2.100E+00 6.49E-01 G
                           92.38 2.160E+00 *(P 2.505E+00 7.72E-01 G

AM-241       1.4118E-01
                           59.54 1.412E-01 &(  5.508E-01 1.65E-01 G
   ( - This peak used in the nuclide activity average.

   * - Peak is too wide, but only one peak in library.
   ! - Peak is part of a multiplet and this area went
       negative during deconvolution.
   ? - Peak is too narrow.
   @ - Peak is too wide at FW25M, but ok at FWHM.
   % - Peak fails sensitivity test.
   $ - Peak identified, but first peak of this nuclide
       failed one or more qualification tests.
   + - Peak activity higher than counting uncertainty range.
   - - Peak activity lower than counting uncertainty range.
   = - Peak outside analysis energy range.
   & - Calculated peak centroid is not close enough to the
       library energy centroid for positive identification.
   P - Peakbackground subtraction
   } - Peak is too close to another for the activity
       to be found directly.

   Nuclide Codes:                      Peak Codes:
   T - Thermal Neutron Activation      G - Gamma Ray
   F - Fast Neutron Activation         X - X-Ray
   I - Fission Product                 P - Positron Decay
   N - Naturally Occurring Isotope     S - Single-Escape
   P - Photon Reaction                 D - Double-Escape
   C - Charged Particle Reaction       K - Key Line
   M - No MDA Calculation              A - Not in Average
   R - Coincidence Corrected           C - Coincidence Peak
   H - Halflife limit exceeded

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
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***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	-3.3286E-02	-3.5069E-02	2.9438E-01	2.9438E-01	3.271E-01
K-40	A	1.0542E-01	1.0542E-01	2.2114E-01	2.2122E-01	2.449E-01
MN-54	#A	4.0646E-03	4.1011E-03	3.9944E-02	3.9945E-02	4.721E-02
CO-57	#B	-9.7950E-04	-9.8966E-04	4.4337E-02	4.4337E-02	4.947E-02
CO-60	#B	6.7800E-03	6.7898E-03	4.4940E-02	4.4942E-02	5.419E-02

Sr-85	#	4.7764E-02	4.9861E-02	3.5545E-02	3.5655E-02	3.198E-02
Kr-85	#A	8.2387E+02	8.2389E+02	8.6231E+02	8.6355E+02	8.894E+02
Y-88	#B	-3.1442E-03	-3.2275E-03	2.9203E-02	2.9203E-02	3.791E-02
NB-94	#B	-1.0574E-02	-1.0574E-02	3.9979E-02	3.9984E-02	4.627E-02
Ag-108M	#B	-6.4720E-03	-6.4724E-03	4.3017E-02	4.3018E-02	5.040E-02
CD-109	#A	6.2904E-03	6.3292E-03	1.7325E+00	1.7325E+00	1.933E+00
SN-113	#B	-1.1660E-02	-1.1946E-02	5.0467E-02	5.0471E-02	5.603E-02
SB-125	#B	4.5340E-02	4.5465E-02	9.2716E-02	9.2751E-02	1.026E-01
I-131	#B	-2.8624E-03	-4.0478E-03	4.5962E-02	4.5962E-02	3.780E-02
CS-134	#B	2.8724E-02	2.8831E-02	3.1925E-02	3.1966E-02	3.552E-02
CS-137	#A	1.7042E-03	1.7046E-03	4.7612E-02	4.7612E-02	5.631E-02
CE-139	#A	-6.9466E-03	-7.0888E-03	4.1910E-02	4.1912E-02	4.325E-02
EU-152	#B	2.1507E-02	2.1520E-02	1.2497E-01	1.2498E-01	1.399E-01
EU-154	#B	1.9819E-03	1.9837E-03	1.0164E-01	1.0164E-01	1.142E-01
EU-155	#B	6.8622E-02	6.8727E-02	2.0093E-01	2.0097E-01	2.225E-01
HG-203	#B	6.9528E-04	7.3812E-04	4.1089E-02	4.1089E-02	4.439E-02
TL-208	#	1.9841E-01	1.9841E-01	8.1574E-02	8.2331E-02	
PB-212	#	4.1426E-01	4.1426E-01	1.1391E-01	1.1626E-01	1.049E-01
PB-214	#	4.5104E-01	4.5104E-01	1.0685E-01	1.0980E-01	7.570E-02
BI-212	#	5.6983E-01	5.6983E-01	5.2090E-01	5.2188E-01	
BI-214		5.0603E-01	5.0603E-01	1.3882E-01	1.4169E-01	
RA-224	#A	1.0484E+00	1.0484E+00	1.0525E+00	1.0542E+00	1.126E+00
RA-226	#	1.3421E+00	1.3421E+00	1.1795E+00	1.1819E+00	
AC-228		4.4956E-01	4.4956E-01	1.7860E-01	1.8037E-01	1.323E-01
TH-227	#B	-1.8830E-01	-1.8830E-01	4.2108E-01	4.2121E-01	4.584E-01
PA-234	#B	2.1114E-02	2.1114E-02	2.0804E-01	2.0805E-01	2.328E-01
TH-234	#B	1.4866E+00	1.4866E+00	1.5378E+00	1.5400E+00	3.989E+00
AM-241	#A	1.4118E-01	1.4118E-01	4.9489E-01	4.9495E-01	5.508E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (295.2 to 1999.0 keV) 3.0659609E+00 pCi/gm
Total Decayed Activity (295.2 to 1999.0 keV) 3.0659671E+00 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JPK

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 103F_9SEP2006_1138.An1

Sample description
FSS-OOL-05-10-009-F-A

Spectrum Filename: C:\GammaVision\Spectra\103F_9SEP2006_1138.An1

Acquisition information
Start time: 09-Sep-2006 11:38:53
Live time: 2000
Real time: 2001
Dead time: 0.05 %
Detector ID: 4

Detector system
Det 103 - DSPE-471

Calibration
Filename: D3_1LSa.Clb
Detector_103 1.0 Liter Sand Geometry

Energy Calibration
Created: 08-Aug-2005 11:09:41
Zero offset: 0.409 keV
Gain: 0.500 keV/channel
Quadratic: 1.092E-08 keV/channel^2

Efficiency Calibration
Created: 08-Aug-2005 11:11:25
Type: Polynomial
Uncertainty: 0.993 %
Coefficients: -0.264059 -5.138468 0.638383
-0.089199 0.005011 -0.000129

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.41keV)
Stop channel: 4000 (2000.67keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 1.4450E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.4450E+03) =
6.9204E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	09-Sep-2006 10:15:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	103_150K_05AUG05.Pbc 08-Aug-2005 12:54:15
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 13 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.0923

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
74.88	53.	29.02	0.99	9.052E-03	74.81	9.600	5.723E-01	PB212
87.83	67.	33.73	0.80	1.464E-02				
93.12	80.	24.75	1.24	1.656E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
					94.67	15.500	PBC<MDA	PA234
186.54	101.	24.44	1.07	2.565E-02	185.99	3.280	9.781E-01	RA226
238.79	297.	7.04	1.09	2.319E-02	238.63	43.100	2.667E-01	PB212
242.43	78.	23.42	1.10	2.300E-02	241.00	3.900	8.133E-01	RA224
					241.92	7.470	4.255E-01	PB214
295.35	235.	9.01	1.38	2.024E-02	295.22	19.200	5.548E-01	PB214
300.55	45.	32.19	0.83	1.999E-02				
337.97	95.	21.55	1.89	1.832E-02				
337.97	95.	21.55	1.89	1.832E-02	338.40	12.010	3.995E-01	AC228
352.00	369.	6.97	0.96	1.775E-02	351.99	37.100	5.154E-01	PB214
463.03	24.	37.66	0.53	1.426E-02				
463.03	24.	37.66	0.53	1.426E-02	463.51	10.000	PBC<MDA	SB125
511.30	22.	28.66	1.50	1.317E-02	510.72	22.500	PBC<MDA	TL208
583.08	106.	13.28	1.26	1.185E-02				
583.08	106.	13.28	1.26	1.185E-02	583.14	86.000	9.318E-02	TL208
609.37	279.	6.95	1.62	1.144E-02	609.32	46.090	4.834E-01	BI214
726.99	38.	23.88	1.65	9.967E-03				
726.99	38.	23.88	1.65	9.967E-03	727.17	11.800	2.967E-01	BI212
911.86	77.	15.87	1.15	8.396E-03	911.07	29.000	2.842E-01	AC228
969.33	40.	19.52	1.55	8.023E-03	968.90	17.460	2.633E-01	AC228
1120.42	92.	16.35	1.85	7.211E-03	1120.28	15.040	7.769E-01	BI214
1238.34	44.	23.43	0.91	6.701E-03				
1461.05	324.	5.72	1.69	5.931E-03	1460.75	10.700	4.495E+00	K40

1764.65	48.	14.43	1.22	5.141E-03	1764.51	15.920	5.110E-01	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
600.25	300.55	78.	45.	0.022	96.57	0.834	PB-212	s
925.18	463.03	28.	25.	0.013	105.73	0.527	AC-228	s
2475.61	1238.34	18.	44.	0.022	70.28	0.909	CO-56	s

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-212	148.79	74.81	108.	53.	0.027	87.06	0.993D
TH-234	184.91	92.87	310.	93.	0.047	71.23	1.500s
TH-234	184.87	92.85	315.	73.	0.037	86.27	1.500s
RA-226	371.71	186.27	288.	95.	0.048	71.17	1.500
PB-212	476.77	238.81	337.	274.	0.137	35.73	0.966
RA-224	482.94	241.89	278.	100.	0.050	76.79	1.500
PB-214	482.94	241.89	282.	89.	0.044	86.32	1.500
PB-214	589.85	295.35	96.	231.	0.115	27.02	1.378s
AC-228	675.54	338.20	102.	59.	0.030	80.74	1.500s
PB-214	703.15	352.00	110.	363.	0.181	20.92	0.964
TL-208	1165.79	583.35	35.	95.	0.047	38.43	1.500
BI-214	1217.84	609.37	45.	273.	0.136	20.86	1.617s
BI-212	1453.68	727.30	25.	33.	0.016	81.10	1.500
AC-228	1821.60	911.29	26.	49.	0.025	56.79	1.505s
AC-228	1937.59	969.29	12.	39.	0.020	60.37	1.541
BI-214	2239.81	1120.42	34.	90.	0.045	49.06	1.850
K-40	2920.97	1461.05	24.	305.	0.153	17.15	1.693
BI-214	3528.06	1764.65	3.	45.	0.022	43.30	1.216s

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	MDA Value pCi/gm	COMMENTS
BE-7		4.3564E-02					
			477.56	4.356E-02	%(	2.499E-01 7.25E-02	G
K-40		4.4950E+00					
			1460.75	4.495E+00	(P	3.757E-01 2.73E-01	G
MN-54		8.6440E-03					
			834.81	8.644E-03	&(P	2.685E-02 7.86E-03	G
CO-57		8.2925E-03					
			122.07	8.293E-03	&(P	3.861E-02 1.15E-02	G K
			136.43	1.747E-02	%	3.105E-01 9.17E-02	G
CO-60		-2.5745E-03					
			1332.51	-2.575E-03	&(P	3.465E-02 8.78E-03	G K
			1173.23	-2.562E-03	% P	3.438E-02 8.95E-03	G K
Sr-85		-1.2810E-02					
			514.00	-1.281E-02	%(	4.129E-02 1.23E-02	G
Kr-85		-2.9585E+02					
			513.99	-2.959E+02	%(	9.526E+02 2.84E+02	G
Y-88		-3.0520E-03					
			1836.01	-3.052E-03	%(P	2.698E-02 7.01E-03	G K
			898.02	9.972E-03	& P	2.308E-02 6.88E-03	G
NB-94		-2.7126E-03					
			871.10	-2.713E-03	%(	2.611E-02 7.24E-03	G K
			702.50	7.295E-04	&	2.936E-02 8.20E-03	G K
Ag-108M		-8.7334E-03					
			722.95	-8.733E-03	%(	3.609E-02 1.05E-02	G K
			614.37	-1.591E-02	% P	3.795E-02 1.14E-02	G
			433.93	1.434E-03	&	2.912E-02 8.33E-03	G
CD-109		-4.1812E-01					
			88.04	-4.181E-01	%(	1.263E+00 3.79E-01	G
SN-113		2.5337E-03					
			391.71	2.534E-03	&(	4.020E-02 1.16E-02	G K
			255.04	1.790E-01	&	1.282E+00 3.77E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	1.7364E-03						
		427.95	1.736E-03	&(P	9.047E-02	2.58E-02	G K
		600.77	7.611E-03	% P	1.078E-01	2.97E-02	G
		636.15	-4.729E-02	% P	2.579E-01	7.38E-02	G
		463.51	-1.536E-02	% P	2.714E-01	7.66E-02	G
		176.29	-5.461E-02	%	4.258E-01	1.26E-01	G
I-131	-3.9741E-03						
		364.48	-3.974E-03	&(P	3.412E-02	9.89E-03	G K
		636.97	1.246E-02	%	4.452E-01	1.26E-01	G
		284.29	-7.449E-02	% P	4.263E-01	1.25E-01	G
CS-134	-1.7726E-03						
		604.66	-1.773E-03	&(	8.268E-02	2.44E-02	G K
		795.76	4.971E-03	% P	2.130E-02	6.00E-03	G
		569.29	9.425E-03	% P	1.598E-01	4.44E-02	G
		801.84	5.639E-02	% P	3.010E-01	8.44E-02	G
CS-137	-1.8357E-03						
		661.62	-1.836E-03	%(P	3.195E-02	8.70E-03	G
CE-139	6.5915E-03						
		165.85	6.591E-03	&(	3.930E-02	1.17E-02	G
EU-152	-3.8080E-03						
		121.78	-3.808E-03	&(P	1.085E-01	3.18E-02	G K
		344.30	7.942E-03	% P	1.013E-01	2.94E-02	G
		1408.08	2.004E-02	%	1.656E-01	4.59E-02	G
		964.00	5.626E-02	& P	1.636E-01	4.77E-02	G
		1112.07	-4.863E-02	%	2.677E-01	7.65E-02	G
		778.90	1.736E-02	%	1.942E-01	5.39E-02	G
EU-154	-6.5178E-03						
		123.10	-6.518E-03	%(	8.672E-02	2.56E-02	G K
		1274.80	-9.266E-03	&	8.838E-02	2.43E-02	G
		723.30	-4.421E-02	%	1.678E-01	4.92E-02	G
		1004.80	-2.651E-02	&	2.078E-01	5.90E-02	G
EU-155	-6.4672E-03						
		86.45	-6.467E-03	%(	1.910E-01	5.64E-02	G K
		105.31	-3.525E-03	%	1.768E-01	5.20E-02	G
HG-203	-2.5743E-03						
		279.17	-2.574E-03	&(P	3.403E-02	9.95E-03	G K
		72.87	-6.834E-01	& P	1.853E+00	5.58E-01	G
		70.83	-2.194E-02	%	3.199E+00	9.41E-01	G
		82.50	9.248E-02	&	2.963E+00	8.73E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	8.6767E-02						
		583.14	8.677E-02	(P	2.780E-02	1.16E-02	G
		510.72	6.785E-02	% P	1.540E-01	4.36E-02	G
PB-212	2.5659E-01						
		238.63	2.566E-01	(P	8.251E-02	3.19E-02	G K
							Energy duplication
		77.11	1.878E-01	} P	3.060E-01	9.37E-02	G
		74.81	5.723E-01	+ P	5.511E-01	1.76E-01	G
PB-214	5.2343E-01						
		351.99	5.154E-01	(P	7.326E-02	3.65E-02	G K
		295.22	5.548E-01	(P	1.166E-01	5.09E-02	G
							Energy duplication
		77.11	4.062E-01	} P	7.591E-01	1.75E-01	G
		241.92	4.828E-01	(	4.403E-01	1.39E-01	G
BI-212	2.6172E-01						
		727.17	2.617E-01	(P	2.052E-01	7.18E-02	G K
		1620.56	1.597E-01	& P	8.445E-01	2.28E-01	G
		785.42	3.328E-01	%	1.356E+00	3.92E-01	G
BI-214	4.9049E-01						
		609.32	4.834E-01	(P	6.055E-02	3.44E-02	G K
		1764.51	5.110E-01	(P	1.273E-01	7.92E-02	G
		1120.28	7.769E-01	+ P	2.573E-01	1.30E-01	G
RA-224	1.0402E+00						
		241.00	1.040E+00	&(	8.359E-01	2.66E-01	G
RA-226	1.0581E+00						
		185.99	1.058E+00	(P	9.091E-01	2.85E-01	G
AC-228	2.2291E-01						
		911.07	1.881E-01	*(P	1.022E-01	3.81E-02	G K
		968.90	2.609E-01	(P	1.245E-01	5.27E-02	G
		338.40	2.517E-01	@(P	2.123E-01	6.90E-02	G
TH-227	-8.1960E-03						
		236.00	-8.196E-03	%(	2.467E-01	7.21E-02	G K
		256.25	-2.141E-04	% P	3.923E-01	1.14E-01	G
PA-234	-3.1635E-02						
		98.44	-3.163E-02	&(P	1.816E-01	5.39E-02	G K
		946.00	-4.546E-04	% P	1.549E-01	4.23E-02	G
		131.28	-6.210E-03	% P	1.255E-01	3.66E-02	G
		94.67	-1.507E-02	% P	2.975E-01	8.76E-02	G
		883.24	3.298E-05	&	2.172E-01	5.85E-02	G
		926.70	6.959E-02	&	2.712E-01	7.86E-02	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26 1.401E-02 % P 2.370E-01 6.59E-02 G

TH-234       8.9466E-01
                           63.29-2.718E-01 &(P 4.379E+00 1.26E+00 G K
                           92.80 1.391E+00  (P 1.619E+00 4.96E-01 G
                           92.38 2.085E+00  (P 1.891E+00 5.88E-01 G

AM-241      -1.4263E-01
                           59.54-1.426E-01 %(P 9.490E-01 2.81E-01 G
   ( - This peak used in the nuclide activity average.

   * - Peak is too wide, but only one peak in library.
   ! - Peak is part of a multiplet and this area went
       negative during deconvolution.
   ? - Peak is too narrow.
   @ - Peak is too wide at FW25M, but ok at FWHM.
   % - Peak fails sensitivity test.
   $ - Peak identified, but first peak of this nuclide
       failed one or more qualification tests.
   + - Peak activity higher than counting uncertainty range.
   - - Peak activity lower than counting uncertainty range.
   = - Peak outside analysis energy range.
   & - Calculated peak centroid is not close enough to the
       library energy centroid for positive identification.
   P - Peakbackground subtraction
   } - Peak is too close to another for the activity
       to be found directly.

   Nuclide Codes:                      Peak Codes:
   T - Thermal Neutron Activation      G - Gamma Ray
   F - Fast Neutron Activation         X - X-Ray
   I - Fission Product                 P - Positron Decay
   N - Naturally Occurring Isotope     S - Single-Escape
   P - Photon Reaction                 D - Double-Escape
   C - Charged Particle Reaction       K - Key Line
   M - No MDA Calculation              A - Not in Average
   R - Coincidence Corrected           C - Coincidence Peak
   H - Halflife limit exceeded

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
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***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	4.3531E-02	4.3564E-02	2.1741E-01	2.1742E-01	2.498E-01
K-40		4.4950E+00	4.4950E+00	8.1805E-01	8.5867E-01	
MN-54	#A	8.6429E-03	8.6440E-03	2.3579E-02	2.3584E-02	2.685E-02
CO-57	#B	8.2913E-03	8.2925E-03	3.4496E-02	3.4499E-02	3.860E-02
CO-60	#B	-2.5744E-03	-2.5745E-03	1.2868E-01	1.2868E-01	3.465E-02

Sr-85	#A	-1.2802E-02	-1.2810E-02	3.6953E-02	3.6961E-02	4.126E-02
Kr-85	#A	-2.9585E+02	-2.9585E+02	8.5268E+02	8.5285E+02	9.526E+02
Y-88	#B	-3.0509E-03	-3.0520E-03	2.2729E-02	2.2730E-02	2.697E-02
NB-94	#B	-2.7126E-03	-2.7126E-03	2.1730E-02	2.1731E-02	2.611E-02
Ag-108M	#B	-8.7334E-03	-8.7334E-03	3.1623E-02	3.1627E-02	3.609E-02
CD-109	#A	-4.1808E-01	-4.1812E-01	1.1370E+00	1.1372E+00	1.263E+00
SN-113	#B	2.5328E-03	2.5337E-03	3.4688E-02	3.4689E-02	4.018E-02
SB-125	#B	1.7363E-03	1.7364E-03	7.7434E-02	7.7435E-02	9.046E-02
I-131	#B	-3.9542E-03	-3.9741E-03	3.7413E-02	3.7414E-02	3.395E-02
CS-134	#B	-1.7725E-03	-1.7726E-03	7.3312E-02	7.3312E-02	8.268E-02
CS-137	#A	-1.8356E-03	-1.8357E-03	2.1053E-01	2.1053E-01	3.195E-02
CE-139	#A	6.5895E-03	6.5915E-03	3.5055E-02	3.5057E-02	3.929E-02
EU-152	#B	-3.8080E-03	-3.8080E-03	1.9487E-01	1.9487E-01	1.085E-01
EU-154	#B	-6.5178E-03	-6.5178E-03	7.6914E-02	7.6915E-02	8.672E-02
EU-155	#B	-6.4670E-03	-6.4672E-03	1.6924E-01	1.6924E-01	1.910E-01
HG-203	#B	-2.5721E-03	-2.5743E-03	3.0336E-02	3.0336E-02	3.400E-02
TL-208	#	8.6767E-02	8.6767E-02	3.4863E-02	3.5225E-02	2.780E-02
PB-212		2.5659E-01	2.5659E-01	9.5690E-02	9.6843E-02	
PB-214		5.2343E-01	5.2343E-01	1.1122E-01	1.1530E-01	
BI-212	#	2.6172E-01	2.6172E-01	2.1545E-01	2.1598E-01	2.052E-01
BI-214		4.9049E-01	4.9049E-01	1.0477E-01	1.0857E-01	
RA-224	#	1.0402E+00	1.0402E+00	7.9879E-01	8.0107E-01	8.359E-01
RA-226	#	1.0581E+00	1.0581E+00	8.5547E-01	8.5767E-01	9.091E-01
AC-228	#	2.2291E-01	2.2291E-01	8.8289E-02	8.9232E-02	1.022E-01
TH-227	#B	-8.1960E-03	-8.1960E-03	2.1640E-01	2.1640E-01	2.467E-01
PA-234	#B	-3.1635E-02	-3.1635E-02	1.8381E-01	1.8382E-01	1.816E-01
TH-234	#B	8.9466E-01	8.9466E-01	7.5757E-01	7.5919E-01	4.379E+00
AM-241	#A	-1.4263E-01	-1.4263E-01	8.7146E-01	8.7150E-01	9.490E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (87.4 to 2000.7 keV) 5.7654996E+00 pCi/gm
Total Decayed Activity (87.4 to 2000.7 keV) 5.7654996E+00 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JJM

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 103F_9SEP2006_1215.An1

Sample description
FSS-OOL-05-10-001-F WET

Spectrum Filename: C:\GammaVision\Spectra\103F_9SEP2006_1215.An1

Acquisition information
Start time: 09-Sep-2006 12:15:52
Live time: 2000
Real time: 2002
Dead time: 0.09 %
Detector ID: 4

Detector system
Det 103 - DSPE-471

Calibration
Filename: D3_1LSa.Clb
Detector_103 1.0 Liter Sand Geometry

Energy Calibration
Created: 08-Aug-2005 11:09:41
Zero offset: 0.409 keV
Gain: 0.500 keV/channel
Quadratic: 1.092E-08 keV/channel^2

Efficiency Calibration
Created: 08-Aug-2005 11:11:25
Type: Polynomial
Uncertainty: 0.993 %
Coefficients: -0.264059 -5.138468 0.638383
-0.089199 0.005011 -0.000129

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.41keV)
Stop channel: 4000 (2000.67keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 1.9800E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.9800E+03) =
5.0505E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

YAEC Chemistry Lab Spectrum name: 103F_9SEP2006_1215.An1

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	09-Sep-2006 08:05:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	103_150K_05AUG05.Pbc 08-Aug-2005 12:54:15
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 17 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.1567

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
74.90	101.	24.79	0.99	9.052E-03	74.81	9.600	7.960E-01	PB212
77.20	130.	16.88	0.99	1.011E-02	77.11	17.500	6.388E-01	PB212
					77.11	10.700	1.045E+00	PB214
186.26	204.	17.55	1.40	2.566E-02	185.99	3.280	1.553E+00	RA226
209.84	80.	40.20	1.56	2.469E-02				
238.77	894.	3.91	1.09	2.320E-02	238.63	43.100	6.024E-01	PB212
240.90	124.	32.71	1.09	2.308E-02	241.00	3.900	9.407E-01	RA224
242.06	90.	25.88	1.10	2.302E-02	241.00	3.900	7.599E-01	RA224
					241.92	7.470	3.976E-01	PB214
295.33	202.	10.47	1.13	2.024E-02	295.22	19.200	3.469E-01	PB214
299.83	54.	33.39	1.13	2.002E-02				
327.94	50.	35.21	0.98	1.874E-02				
338.56	223.	13.74	1.16	1.829E-02	338.40	12.010	6.890E-01	AC228
351.99	351.	7.36	1.14	1.775E-02	351.99	37.100	3.581E-01	PB214
462.99	83.	26.04	1.06	1.426E-02				
462.99	83.	26.04	1.06	1.426E-02	463.51	10.000	3.935E-01	SB125
511.22	151.	17.14	1.38	1.316E-02	510.72	22.500	2.872E-01	TL208
583.30	297.	8.02	1.27	1.184E-02	583.14	86.000	1.961E-01	TL208
609.50	284.	8.12	1.36	1.144E-02	609.32	46.090	3.595E-01	BI214
661.92	64.	26.67	1.11	1.072E-02	661.62	84.620	4.687E-02	CS137
727.75	74.	19.54	1.38	9.959E-03	727.17	11.800	4.267E-01	BI212
768.26	54.	28.32	1.79	9.554E-03				
795.06	36.	28.94	1.50	9.301E-03	795.76	85.400	3.092E-02	CS134
911.19	248.	8.85	1.37	8.400E-03	911.07	29.000	6.853E-01	AC228
964.99	35.	28.90	1.54	8.049E-03				
969.14	122.	11.24	1.54	8.024E-03	968.90	17.460	5.912E-01	AC228
1120.14	81.	28.42	1.84	7.212E-03	1120.28	15.040	4.978E-01	BI214

1461.12	1045.	3.12	1.88	5.931E-03	1460.75	10.700	1.104E+01	K40
1764.81	63.	12.60	1.24	5.141E-03	1764.51	15.920	4.980E-01	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
418.85	209.84	393.	80.	0.040	120.59	1.557	NP-239	s
480.97	240.81	761.	124.	0.062	98.14	1.094	RA-224	lD
598.89	299.87	184.	69.	0.035	94.05	1.246	TH-227	s
655.03	327.94	130.	50.	0.025	105.64	0.984	AC-228	
1322.92	661.92	83.	64.	0.032	80.01	1.114	CS-137	l
1535.58	768.26	65.	54.	0.027	84.97	1.786	BI-214	s
1929.57	965.06	35.	34.	0.017	89.95	1.539	AC-228	D

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-212	148.79	74.81	286.	101.	0.051	74.36	0.993D
PB-212	153.39	77.11	295.	130.	0.065	50.63	0.995A
RA-226	371.65	186.24	574.	143.	0.072	68.72	1.500s
PB-212	476.42	238.63	179.	883.	0.441	11.76	1.093D
PB-214	483.00	241.92	296.	90.	0.045	77.64	1.095A
PB-214	589.89	295.37	181.	184.	0.092	37.78	0.986
AC-228	676.27	338.56	248.	222.	0.111	41.23	1.160s
PB-214	703.15	352.01	189.	354.	0.177	24.67	1.147
SB-125	925.22	463.05	113.	64.	0.032	78.75	1.500
TL-208	1021.55	511.22	180.	125.	0.062	51.43	1.383s
TL-208	1165.70	583.30	94.	293.	0.146	24.05	1.273
BI-214	1218.10	609.50	98.	278.	0.139	24.35	1.357
BI-212	1454.57	727.75	54.	74.	0.037	58.61	1.378
CS-134	1589.17	795.06	37.	36.	0.018	86.81	1.500s
AC-228	1821.41	911.19	68.	245.	0.122	26.56	1.371s
AC-228	1936.81	968.90	31.	121.	0.061	33.36	1.541D
BI-214	2239.26	1120.14	104.	79.	0.040	85.25	1.837s
K-40	2921.11	1461.12	24.	1027.	0.513	9.37	1.879
BI-214	3528.38	1764.81	3.	60.	0.030	37.80	1.238s

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	MDA Value pCi/gm		COMMENTS
BE-7		4.2876E-02						
			477.56	4.288E-02	%(	2.261E-01	6.62E-02	G
K-40		1.1040E+01						
			1460.75	1.104E+01	(P	2.762E-01	3.51E-01	G
MN-54		7.0003E-03						
			834.81	7.000E-03	%(P	2.100E-02	6.18E-03	G
CO-57		8.4751E-03						
			122.07	8.475E-03	&(P	4.167E-02	1.25E-02	G K
			136.43	4.243E-03	%	3.223E-01	9.57E-02	G
CO-60		-5.0856E-03						
			1332.51	-5.086E-03	%(P	3.238E-02	8.73E-03	G K
			1173.23	4.951E-03	& P	3.075E-02	8.70E-03	G K
Sr-85		-1.3613E-02						
			514.00	-1.361E-02	%(	3.717E-02	1.12E-02	G
Kr-85		-3.1358E+02						
			513.99	-3.136E+02	%(	8.564E+02	2.57E+02	G
Y-88		2.6110E-03						
			1836.01	2.611E-03	&(P	2.392E-02	6.40E-03	G K
			898.02	1.012E-03	& P	3.038E-02	8.54E-03	G
NB-94		2.0198E-03						
			871.10	2.020E-03	&(	2.840E-02	8.07E-03	G K
			702.50	7.968E-03	%	2.203E-02	6.55E-03	G K
Ag-108M		3.1188E-04						
			722.95	3.119E-04	%(	3.463E-02	9.90E-03	G K
			614.37	-9.070E-03	& P	3.733E-02	1.11E-02	G
			433.93	-4.185E-03	%	2.779E-02	8.15E-03	G
CD-109		4.5868E-02						
			88.04	4.587E-02	%(	1.468E+00	4.36E-01	G
SN-113		8.9324E-03						
			391.71	8.932E-03	%(	3.965E-02	1.17E-02	G K
			255.04	-1.549E-01	&	1.353E+00	4.01E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	8.0017E-02						
		427.95	4.248E-03	&(P	8.900E-02	2.59E-02	G K
		600.77	3.409E-02	& P	1.533E-01	4.51E-02	G
		636.15	-5.267E-03	% P	2.170E-01	6.11E-02	G
		463.51	3.043E-01	(P	2.508E-01	8.15E-02	G
		176.29	3.599E-02	&	5.135E-01	1.53E-01	G
I-131	-1.9708E-03						
		364.48	-1.971E-03	%(P	3.215E-02	9.37E-03	G K
		636.97	-8.963E-02	%	3.736E-01	1.10E-01	G
		284.29	4.109E-03	& P	4.765E-01	1.40E-01	G
CS-134	8.6532E-03						
		604.66	-1.083E-02	&(	3.272E-02	9.77E-03	G K
		795.76	3.092E-02	(P	2.653E-02	8.97E-03	G
		569.29	3.151E-02	% P	1.916E-01	5.60E-02	G
		801.84	3.920E-03	& P	2.214E-01	5.95E-02	G
CS-137	2.7398E-02						
		661.62	2.740E-02	%(P	3.839E-02	1.19E-02	G
CE-139	-6.0386E-04						
		165.85	-6.039E-04	&(	3.852E-02	1.14E-02	G
EU-152	2.4132E-02						
		121.78	2.413E-02	&(P	1.222E-01	3.66E-02	G K
		344.30	-5.231E-03	& P	9.694E-02	2.84E-02	G
		1408.08	3.721E-02	%	1.067E-01	3.13E-02	G
		964.00	3.091E-02	% P	2.158E-01	6.20E-02	G
		1112.07	-7.132E-03	&	2.843E-01	8.09E-02	G
		778.90	6.671E-02	%	2.179E-01	6.45E-02	G
EU-154	2.0304E-02						
		123.10	2.030E-02	&(	8.191E-02	2.46E-02	G K
		1274.80	3.051E-02	%	9.284E-02	2.74E-02	G
		723.30	-1.010E-01	%	1.931E-01	5.88E-02	G
		1004.80	-3.855E-02	&	1.864E-01	5.43E-02	G
EU-155	-4.0142E-02						
		86.45	-4.014E-02	&(	1.967E-01	5.90E-02	G K
		105.31	9.875E-02	%	1.910E-01	5.80E-02	G
HG-203	-2.9024E-04						
		279.17	-2.902E-04	&(P	2.899E-02	8.48E-03	G K
		72.87	-3.777E-01	% P	1.639E+00	4.91E-01	G
		70.83	-6.465E-01	&	3.677E+00	1.10E+00	G
		82.50	0.000E+00	%	3.268E+00	9.72E-01	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments

TL-208       1.9611E-01
                          583.14 1.961E-01  (P 3.214E-02 1.60E-02 G
                          510.72 2.872E-01 + P 1.503E-01 5.98E-02 G

PB-212       6.1312E-01
                          238.63 6.027E-01  (P 4.446E-02 2.39E-02 G K
                                                          Energy duplication
                           77.11 5.016E-01 } P 3.192E-01 8.46E-02 G
                           74.81 7.960E-01 + P 6.402E-01 2.03E-01 G

PB-214       3.5702E-01
                          351.99 3.666E-01  (P 6.924E-02 3.06E-02 G K
                          295.22 3.227E-01  (P 1.149E-01 4.16E-02 G
                                                          Energy duplication
                           77.11 2.723E-03 } P 7.898E-01 8.00E-02 G
                          241.92 3.570E-01 }   3.288E-01 9.24E-02 G

BI-212       4.2665E-01
                          727.17 4.267E-01  (P 2.154E-01 8.40E-02 G K
                         1620.56-2.019E-03 % P 9.396E-01 2.48E-01 G
                          785.42 3.730E-01 &   1.291E+00 3.80E-01 G

BI-214       3.5952E-01
                          609.32 3.595E-01  (P 6.331E-02 2.99E-02 G K
                         1764.51 4.980E-01 + P 9.288E-02 6.62E-02 G
                         1120.28 4.978E-01 + P 3.159E-01 1.45E-01 G

RA-224       7.5359E-01
                                                          Derived Ave Activity
                          241.00 7.536E-01 }(  1.011E+00 3.24E-01 G

RA-226       1.1599E+00
                          185.99 1.160E+00 *(P 9.268E-01 2.90E-01 G

AC-228       6.5792E-01
                          911.07 6.853E-01 @(P 1.155E-01 6.15E-02 G K
                          968.90 5.910E-01  (P 1.389E-01 6.58E-02 G
                          338.40 6.890E-01  (P 2.363E-01 9.52E-02 G

TH-227      -2.0236E-01
                          236.00-2.024E-01 %(  3.478E-01 1.06E-01 G K
                          256.25-5.612E-02 % P 4.148E-01 1.23E-01 G

PA-234       2.3418E-03
                           98.44 2.342E-03 &(P 1.440E-01 4.25E-02 G K
                          946.00-4.044E-02 & P 1.756E-01 5.15E-02 G
                          131.28-3.292E-02 & P 1.839E-01 5.51E-02 G
                           94.67-5.638E-02 % P 3.432E-01 1.03E-01 G
                          883.24-3.046E-02 %   2.410E-01 6.92E-02 G
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 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          926.70 7.326E-03 %   2.565E-01 7.21E-02 G
                          569.26 4.674E-02 % P 2.843E-01 8.30E-02 G

TH-234       3.1771E-01
                           63.29 3.177E-01 %(P 5.489E+00 1.63E+00 G K
                           92.80 9.112E-01 % P 1.865E+00 5.63E-01 G
                           92.38 1.107E+00 & P 2.202E+00 6.65E-01 G

AM-241      -2.0249E-01
                           59.54-2.025E-01 %(P 9.686E-01 2.90E-01 G
   ( - This peak used in the nuclide activity average.

   * - Peak is too wide, but only one peak in library.
   ! - Peak is part of a multiplet and this area went
       negative during deconvolution.
   ? - Peak is too narrow.
   @ - Peak is too wide at FW25M, but ok at FWHM.
   % - Peak fails sensitivity test.
   $ - Peak identified, but first peak of this nuclide
       failed one or more qualification tests.
   + - Peak activity higher than counting uncertainty range.
   - - Peak activity lower than counting uncertainty range.
   = - Peak outside analysis energy range.
   & - Calculated peak centroid is not close enough to the
       library energy centroid for positive identification.
   P - Peakbackground subtraction
   } - Peak is too close to another for the activity
       to be found directly.

   Nuclide Codes:                      Peak Codes:
   T - Thermal Neutron Activation      G - Gamma Ray
   F - Fast Neutron Activation         X - X-Ray
   I - Fission Product                 P - Positron Decay
   N - Naturally Occurring Isotope     S - Single-Escape
   P - Photon Reaction                 D - Double-Escape
   C - Charged Particle Reaction       K - Key Line
   M - No MDA Calculation              A - Not in Average
   R - Coincidence Corrected           C - Coincidence Peak
   H - Halflife limit exceeded

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
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***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	4.2779E-02	4.2876E-02	1.9873E-01	1.9875E-01	2.256E-01
K-40		1.1040E+01	1.1040E+01	1.0536E+00	1.2332E+00	
MN-54	#A	6.9976E-03	7.0003E-03	1.8530E-02	1.8535E-02	2.099E-02
CO-57	#B	8.4713E-03	8.4751E-03	3.7444E-02	3.7447E-02	4.166E-02

CO-60	#B	-5.0853E-03	-5.0856E-03	9.2757E-02	9.2758E-02	3.238E-02
Sr-85	#A	-1.3588E-02	-1.3613E-02	3.3515E-02	3.3524E-02	3.710E-02
Kr-85	#A	-3.1358E+02	-3.1358E+02	7.7225E+02	7.7247E+02	8.564E+02
Y-88	#B	2.6081E-03	2.6110E-03	1.9206E-02	1.9207E-02	2.389E-02
NB-94	#B	2.0198E-03	2.0198E-03	2.4211E-02	2.4211E-02	2.840E-02
Ag-108M	#B	3.1188E-04	3.1188E-04	2.9706E-02	2.9706E-02	3.463E-02
CD-109	#A	4.5856E-02	4.5868E-02	1.3081E+00	1.3081E+00	1.467E+00
SN-113	#B	8.9230E-03	8.9324E-03	3.5240E-02	3.5244E-02	3.961E-02
SB-125	#B	8.0007E-02	8.0017E-02	6.4280E-02	6.4448E-02	8.899E-02
I-131	#B	-1.9415E-03	-1.9708E-03	3.9759E-02	3.9759E-02	3.167E-02
CS-134	#B	8.6518E-03	8.6532E-03	7.5302E-03	7.5469E-03	3.272E-02
CS-137	#A	2.7398E-02	2.7398E-02	3.5691E-02	3.5726E-02	3.839E-02
CE-139	#A	-6.0333E-04	-6.0386E-04	3.4287E-02	3.4287E-02	3.849E-02
EU-152	#B	2.4132E-02	2.4132E-02	1.0978E-01	1.0978E-01	1.222E-01
EU-154	#B	2.0304E-02	2.0304E-02	7.3701E-02	7.3710E-02	8.191E-02
EU-155	#B	-4.0139E-02	-4.0142E-02	1.7691E-01	1.7693E-01	1.966E-01
HG-203	#B	-2.8949E-04	-2.9024E-04	2.8272E-02	2.8272E-02	2.891E-02
TL-208		1.9611E-01	1.9611E-01	4.7862E-02	4.9198E-02	
PB-212		6.1312E-01	6.1312E-01	7.3056E-02	8.1267E-02	
PB-214		3.5702E-01	3.5702E-01	8.9480E-02	9.1850E-02	
BI-212		4.2665E-01	4.2665E-01	2.5174E-01	2.5295E-01	
BI-214		3.5952E-01	3.5952E-01	8.9578E-02	9.1977E-02	
RA-224	A	7.5359E-01	7.5359E-01	9.4317E-01	9.4419E-01	
RA-226	#	1.1599E+00	1.1599E+00	8.6927E-01	8.7187E-01	9.268E-01
AC-228		6.5792E-01	6.5792E-01	1.3080E-01	1.3626E-01	
TH-227	#B	-2.0236E-01	-2.0236E-01	3.1774E-01	3.1795E-01	3.478E-01
PA-234	#B	2.3418E-03	2.3418E-03	1.2746E-01	1.2746E-01	1.440E-01
TH-234	#B	3.1771E-01	3.1771E-01	4.8846E+00	4.8846E+00	5.489E+00
AM-241	#A	-2.0249E-01	-2.0249E-01	8.8420E-01	8.8427E-01	9.686E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (1120.0 to 2000.7 keV) 1.4403505E+01 pCi/gm
Total Decayed Activity (1120.0 to 2000.7 keV) 1.4403505E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JJM

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 103F_9SEP2006_1253.An1

Sample description
FSS-OOL-05-10-006-F-A-S

Spectrum Filename: C:\GammaVision\Spectra\103F_9SEP2006_1253.An1

Acquisition information
Start time: 09-Sep-2006 12:53:18
Live time: 2000
Real time: 2001
Dead time: 0.05 %
Detector ID: 4

Detector system
Det 103 - DSPE-471

Calibration
Filename: D3_1LSa.Clb
Detector_103 1.0 Liter Sand Geometry

Energy Calibration
Created: 08-Aug-2005 11:09:41
Zero offset: 0.409 keV
Gain: 0.500 keV/channel
Quadratic: 1.092E-08 keV/channel^2

Efficiency Calibration
Created: 08-Aug-2005 11:11:25
Type: Polynomial
Uncertainty: 0.993 %
Coefficients: -0.264059 -5.138468 0.638383
-0.089199 0.005011 -0.000129

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.41keV)
Stop channel: 4000 (2000.67keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 1.5150E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.5150E+03) =
6.6007E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	09-Sep-2006 08:48:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	103_150K_05AUG05.Pbc 08-Aug-2005 12:54:15
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 13 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.2208

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
74.95	60.	27.51	0.99	9.100E-03	74.81	9.600	PBC<MDA	PB212
77.15	35.	3.45	0.99	1.011E-02	77.11	10.700	PBC<MDA	PB214
					77.11	17.500	3.254E-01	PB212
93.03	106.	27.30	1.60	1.653E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
185.89	115.	24.92	1.26	2.567E-02				
185.89	115.	24.92	1.26	2.567E-02	185.99	3.280	1.085E+00	RA226
238.79	279.	7.75	1.09	2.320E-02	238.63	43.100	2.380E-01	PB212
242.14	94.	18.95	1.10	2.302E-02	241.92	7.470	4.880E-01	PB214
295.36	205.	11.52	1.12	2.024E-02	295.22	19.200	4.610E-01	PB214
338.91	81.	28.60	1.14	1.828E-02	338.40	12.010	3.243E-01	AC228
351.92	384.	7.20	1.18	1.776E-02	351.99	37.100	5.124E-01	PB214
510.88	68.	18.77	1.37	1.317E-02	510.72	22.500	1.238E-01	TL208
583.19	114.	13.76	1.28	1.184E-02	583.14	86.000	9.605E-02	TL208
609.51	259.	7.15	1.04	1.144E-02	609.32	46.090	4.272E-01	BI214
911.50	68.	17.40	1.85	8.398E-03	911.07	29.000	2.363E-01	AC228
969.70	52.	25.36	1.29	8.021E-03	968.90	17.460	3.275E-01	AC228
1120.75	68.	14.77	1.29	7.210E-03	1120.28	15.040	5.453E-01	BI214
1461.26	360.	5.61	1.86	5.930E-03	1460.75	10.700	4.796E+00	K40
1764.85	41.	16.50	1.41	5.141E-03	1764.51	15.920	4.133E-01	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
149.08	74.91	106.	60.	0.030	82.54	0.993	PB-214	D

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-212	153.39	77.11	148.	35.	0.018	10.35	0.995A
RA-226	371.75	186.29	316.	91.	0.046	76.83	1.500s
PB-212	476.33	238.59	202.	199.	0.100	34.56	0.960
PB-214	483.03	241.94	173.	50.	0.025	119.40	0.973
PB-214	589.86	295.36	130.	201.	0.100	34.56	1.125
AC-228	676.51	338.68	123.	51.	0.025	99.29	1.500s
PB-214	702.99	351.92	121.	378.	0.189	21.59	1.176
TL-208	1020.88	510.88	66.	41.	0.021	56.30	1.373s
TL-208	1165.48	583.19	48.	110.	0.055	41.27	1.277
BI-214	1218.11	609.51	41.	253.	0.126	21.45	1.037
AC-228	1822.10	911.53	21.	57.	0.028	48.74	1.505s
AC-228	1937.93	969.46	25.	33.	0.016	83.30	1.541
BI-214	2240.47	1120.75	15.	66.	0.033	44.31	1.291
K-40	2921.39	1461.26	31.	341.	0.171	16.83	1.860
BI-214	3528.46	1764.85	5.	38.	0.019	49.51	1.406s

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	Peak MDA Value pCi/gm	COMMENTS
BE-7		5.1869E-02					
			477.56	5.187E-02	%(	1.995E-01 5.83E-02	G
K-40		4.7960E+00					
			1460.75	4.796E+00	(P	4.011E-01 2.84E-01	G
MN-54		-5.7271E-03					
			834.81	-5.727E-03	%(P	2.913E-02 8.31E-03	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CO-57	1.4713E-02						
		122.07	1.471E-02	&(P	3.690E-02	1.11E-02	G K
		136.43	0.000E+00	%	3.207E-01	9.46E-02	G
CO-60	-4.2680E-03						
		1332.51	-4.268E-03	%(P	2.926E-02	7.07E-03	G K
		1173.23	4.052E-03	% P	2.898E-02	7.87E-03	G K
Sr-85	-9.0553E-03						
		514.00	-9.055E-03	&(	3.206E-02	9.50E-03	G
Kr-85	-2.0866E+02						
		513.99	-2.087E+02	&(	7.389E+02	2.19E+02	G
Y-88	2.6803E-03						
		1836.01	2.680E-03	%(P	1.329E-02	1.80E-03	G K
		898.02	-2.335E-03	% P	2.893E-02	7.87E-03	G
NB-94	-2.2877E-03						
		871.10	-2.288E-03	%(	2.606E-02	7.23E-03	G K
		702.50	-1.365E-03	%	2.892E-02	8.13E-03	G K
Ag-108M	-3.6618E-03						
		722.95	-3.662E-03	&(	3.070E-02	8.72E-03	G K
		614.37	-1.222E-02	% P	3.173E-02	9.48E-03	G
		433.93	2.408E-03	&	2.705E-02	7.77E-03	G
CD-109	5.3590E-01						
		88.04	5.359E-01	&(	1.347E+00	4.06E-01	G
SN-113	1.2986E-02						
		391.71	1.299E-02	%(	3.334E-02	9.99E-03	G K
		255.04	2.484E-01	&	1.215E+00	3.60E-01	G
SB-125	-2.4038E-02						
		427.95	-2.404E-02	%(P	9.446E-02	2.79E-02	G K
		600.77	-4.912E-03	& P	1.288E-01	3.59E-02	G
		636.15	-4.503E-02	% P	2.144E-01	6.11E-02	G
		463.51	1.033E-01	& P	2.544E-01	7.61E-02	G
		176.29	-8.308E-02	%	4.979E-01	1.48E-01	G
I-131	4.2100E-03						
		364.48	4.210E-03	%(P	2.753E-02	7.98E-03	G K
		636.97	0.000E+00	%	4.201E-01	1.18E-01	G
		284.29	6.514E-02	& P	4.365E-01	1.28E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CS-134	-1.3587E-02						
		604.66	-1.359E-02	%(	3.769E-02	1.13E-02	G K
		795.76	8.602E-03	% P	2.974E-02	8.67E-03	G
		569.29	-4.489E-02	% P	1.774E-01	5.09E-02	G
		801.84	-4.887E-02	% P	3.012E-01	8.20E-02	G
CS-137	-3.6968E-03						
		661.62	-3.697E-03	%(P	3.298E-02	9.18E-03	G
CE-139	-6.7814E-03						
		165.85	-6.781E-03	%(	3.771E-02	1.12E-02	G
EU-152	4.5445E-02						
		121.78	4.545E-02	&(P	1.076E-01	3.25E-02	G K
		344.30	-3.613E-02	% P	1.095E-01	3.27E-02	G
		1408.08	3.275E-02	%	9.827E-02	2.84E-02	G
		964.00	6.927E-02	% P	1.974E-01	5.81E-02	G
		1112.07	-7.877E-03	&	2.375E-01	6.52E-02	G
		778.90	-3.794E-02	%	1.866E-01	5.33E-02	G
EU-154	-2.9955E-02						
		123.10	-2.995E-02	%(	9.178E-02	2.76E-02	G K
		1274.80	-5.009E-04	%	8.743E-02	2.34E-02	G
		723.30	-2.006E-02	%	1.428E-01	4.07E-02	G
		1004.80	-3.130E-02	&	1.660E-01	4.72E-02	G
EU-155	2.0562E-03						
		86.45	2.056E-03	%(	1.894E-01	5.59E-02	G K
		105.31	2.795E-02	%	1.714E-01	5.09E-02	G
HG-203	7.2358E-03						
		279.17	7.236E-03	&(P	3.141E-02	9.31E-03	G K
		72.87	-1.237E-02	% P	1.865E+00	5.51E-01	G
		70.83	-9.303E-01	%	3.280E+00	9.83E-01	G
		82.50	-7.106E-02	%	2.626E+00	7.72E-01	G
TL-208	1.0180E-01						
		583.14	9.605E-02	(P	3.073E-02	1.37E-02	G
		510.72	1.238E-01	*(P	1.220E-01	3.83E-02	G
PB-212	1.7756E-01						
		238.63	1.776E-01	(P	6.150E-02	2.17E-02	G K
							Energy duplication
		77.11	1.776E-01	} P	2.998E-01	6.13E-03	G
		74.81	5.586E-01	% P	9.315E-01	2.84E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
PB-214	4.9489E-01						
		351.99	5.124E-01	(P	7.299E-02	3.74E-02	G K
		295.22	4.610E-01	(P	1.281E-01	5.42E-02	G
							Energy duplication
		77.11	9.392E-02	} P	6.991E-01	1.61E-01	G
		241.92	2.593E-01	-	3.320E-01	1.03E-01	G
BI-212	1.2487E-01						
		727.17	1.249E-01	%(P	2.108E-01	6.52E-02	G K
		1620.56	1.720E-01	% P	8.641E-01	2.36E-01	G
		785.42	3.686E-01	%	1.219E+00	3.56E-01	G
BI-214	4.2365E-01						
		609.32	4.272E-01	(P	5.536E-02	3.13E-02	G K
		1764.51	4.133E-01	(P	1.439E-01	7.41E-02	G
		1120.28	5.453E-01	+ P	1.692E-01	8.29E-02	G
RA-224	-4.4589E-01						
		241.00	-4.459E-01	%(	8.106E-01	2.47E-01	G
RA-226	9.6592E-01						
		185.99	9.659E-01	*(P	9.069E-01	2.83E-01	G
AC-228	2.0740E-01						
		911.07	2.078E-01	(P	8.814E-02	3.58E-02	G K
		968.90	2.073E-01	(P	1.657E-01	5.78E-02	G
		338.40	2.065E-01	*(P	2.208E-01	6.98E-02	G
TH-227	-6.3462E-02						
		236.00	-6.346E-02	&(	3.001E-01	8.95E-02	G K
		256.25	4.519E-02	% P	3.800E-01	1.12E-01	G
PA-234	-2.6790E-02						
		98.44	-2.679E-02	&(P	1.673E-01	4.96E-02	G K
		946.00	-6.029E-03	& P	2.045E-01	5.78E-02	G
		131.28	-2.246E-02	% P	1.738E-01	5.16E-02	G
		94.67	6.024E-03	& P	3.082E-01	9.08E-02	G
		883.24	2.718E-02	&	1.973E-01	5.50E-02	G
		926.70	-6.202E-04	%	2.079E-01	5.51E-02	G
		569.26	-6.634E-02	% P	2.631E-01	7.54E-02	G
TH-234	1.0388E+00						
		63.29	1.039E+00	%(P	5.171E+00	1.53E+00	G K
		92.80	9.997E-01	% P	1.689E+00	5.10E-01	G
		92.38	1.134E+00	% P	2.003E+00	6.04E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
AM-241	-5.8683E-02						
		59.54	-5.868E-02	&(P	9.447E-01	2.79E-01	G

(- This peak used in the nuclide activity average.

* - Peak is too wide, but only one peak in library.
! - Peak is part of a multiplet and this area went negative during deconvolution.
? - Peak is too narrow.
@ - Peak is too wide at FW25M, but ok at FWHM.
% - Peak fails sensitivity test.
$ - Peak identified, but first peak of this nuclide failed one or more qualification tests.
+ - Peak activity higher than counting uncertainty range.
- - Peak activity lower than counting uncertainty range.
= - Peak outside analysis energy range.
& - Calculated peak centroid is not close enough to the library energy centroid for positive identification.
P - Peakbackground subtraction
} - Peak is too close to another for the activity to be found directly.

Nuclide Codes:	Peak Codes:
T - Thermal Neutron Activation	G - Gamma Ray
F - Fast Neutron Activation	X - X-Ray
I - Fission Product	P - Positron Decay
N - Naturally Occurring Isotope	S - Single-Escape
P - Photon Reaction	D - Double-Escape
C - Charged Particle Reaction	K - Key Line
M - No MDA Calculation	A - Not in Average
R - Coincidence Corrected	C - Coincidence Peak
H - Halflife limit exceeded	

- -

***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	5.1754E-02	5.1869E-02	1.7479E-01	1.7482E-01	1.991E-01
K-40		4.7960E+00	4.7960E+00	8.5157E-01	8.9594E-01	
MN-54	#A	-5.7249E-03	-5.7271E-03	2.8221E-02	2.8223E-02	2.912E-02
CO-57	#B	1.4706E-02	1.4713E-02	3.3382E-02	3.3392E-02	3.689E-02
CO-60	#B	-4.2678E-03	-4.2680E-03	3.0863E-01	3.0863E-01	2.926E-02
Sr-85	#A	-9.0389E-03	-9.0553E-03	2.8497E-02	2.8502E-02	3.201E-02
Kr-85	#A	-2.0866E+02	-2.0866E+02	6.5668E+02	6.5679E+02	7.389E+02
Y-88	#B	2.6773E-03	2.6803E-03	5.4081E-03	5.4104E-03	1.327E-02
NB-94	#B	-2.2877E-03	-2.2877E-03	2.1683E-02	2.1683E-02	2.606E-02
Ag-108M	#B	-3.6618E-03	-3.6618E-03	2.6147E-02	2.6148E-02	3.070E-02
CD-109	#A	5.3576E-01	5.3590E-01	1.2191E+00	1.2195E+00	1.347E+00

SN-113	#B	1.2972E-02	1.2986E-02	2.9958E-02	2.9968E-02	3.330E-02
SB-125	#B	-2.4036E-02	-2.4038E-02	8.4204E-02	8.4216E-02	9.445E-02
I-131	#B	4.1486E-03	4.2100E-03	2.3934E-02	2.3935E-02	2.713E-02
CS-134	#B	-1.3585E-02	-1.3587E-02	3.3818E-02	3.3828E-02	3.768E-02
CS-137	#A	-3.6967E-03	-3.6968E-03	5.9765E-02	5.9765E-02	3.298E-02
CE-139	#A	-6.7756E-03	-6.7814E-03	3.3663E-02	3.3665E-02	3.767E-02
EU-152	#B	4.5444E-02	4.5445E-02	9.7445E-02	9.7478E-02	1.076E-01
EU-154	#B	-2.9954E-02	-2.9955E-02	8.2792E-02	8.2808E-02	9.178E-02
EU-155	#B	2.0561E-03	2.0562E-03	1.6782E-01	1.6782E-01	1.894E-01
HG-203	#B	7.2175E-03	7.2358E-03	2.7927E-02	2.7930E-02	3.133E-02
TL-208		1.0180E-01	1.0180E-01	4.3668E-02	4.4066E-02	
PB-212		1.7756E-01	1.7756E-01	6.5062E-02	6.5874E-02	
PB-214		4.9489E-01	4.9489E-01	1.0272E-01	1.0666E-01	
BI-212	#B	1.2487E-01	1.2487E-01	1.9566E-01	1.9580E-01	2.108E-01
BI-214		4.2365E-01	4.2365E-01	9.3211E-02	9.6402E-02	
RA-224	#A	-4.4589E-01	-4.4589E-01	7.4093E-01	7.4138E-01	8.106E-01
RA-226	#	9.6592E-01	9.6592E-01	8.4753E-01	8.4939E-01	9.069E-01
AC-228	#	2.0740E-01	2.0740E-01	9.7657E-02	9.8396E-02	8.814E-02
TH-227	#B	-6.3462E-02	-6.3462E-02	2.6841E-01	2.6844E-01	3.001E-01
PA-234	#B	-2.6790E-02	-2.6790E-02	1.7182E-01	1.7183E-01	1.673E-01
TH-234	#B	1.0388E+00	1.0388E+00	4.6003E+00	4.6006E+00	5.171E+00
AM-241	#A	-5.8683E-02	-5.8683E-02	9.0043E-01	9.0044E-01	9.447E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (92.9 to 2000.7 keV) 5.9939237E+00 pCi/gm
Total Decayed Activity (92.9 to 2000.7 keV) 5.9939237E+00 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JJM

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 103F_11SEPT2006_1017.An1

Sample description
OOL-05-10-006-F-S WET

Spectrum Filename: C:\GammaVision\Spectra\103F_11SEPT2006_1017.An1

Acquisition information
Start time: 11-Sep-2006 10:17:28
Live time: 2000
Real time: 2002
Dead time: 0.08 %
Detector ID: 4

Detector system
Det 103 - DSPE-471

Calibration
Filename: D3_1LSa.Clb
Detector_103 1.0 Liter Sand Geometry

Energy Calibration
Created: 08-Aug-2005 11:09:41
Zero offset: 0.409 keV
Gain: 0.500 keV/channel
Quadratic: 1.092E-08 keV/channel^2

Efficiency Calibration
Created: 08-Aug-2005 11:11:25
Type: Polynomial
Uncertainty: 0.993 %
Coefficients: -0.264059 -5.138468 0.638383
-0.089199 0.005011 -0.000129

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.41keV)
Stop channel: 4000 (2000.67keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 1.9660E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.9660E+03) =
5.0865E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	09-Sep-2006 08:48:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	103_150K_05AUG05.Pbc 08-Aug-2005 12:54:15
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 13 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.0841

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
74.50	57.	41.31	0.99	8.990E-03	74.81	9.600	PBC<MDA	PB212
93.70	80.	37.28	1.63	1.676E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
					94.67	15.500	PBC<MDA	PA234
186.77	198.	17.47	0.92	2.564E-02	185.99	3.280	1.511E+00	RA226
238.70	598.	4.94	1.09	2.319E-02	238.63	43.100	4.032E-01	PB212
241.83	140.	16.34	1.10	2.303E-02	241.00	3.900	1.072E+00	RA224
					241.92	7.470	5.608E-01	PB214
295.18	270.	10.78	1.15	2.025E-02	295.22	19.200	4.693E-01	PB214
338.28	123.	14.61	1.61	1.831E-02	338.40	12.010	3.812E-01	AC228
351.89	445.	7.80	1.08	1.776E-02	351.99	37.100	4.585E-01	PB214
462.82	75.	24.36	1.24	1.426E-02				
462.82	75.	24.36	1.24	1.426E-02	463.51	10.000	3.581E-01	SB125
510.52	133.	14.13	1.82	1.318E-02	510.72	22.500	2.466E-01	TL208
583.10	215.	8.89	1.21	1.185E-02	583.14	86.000	1.422E-01	TL208
609.18	329.	7.60	1.28	1.144E-02	609.32	46.090	4.200E-01	BI214
727.16	61.	25.87	1.04	9.965E-03				
727.16	61.	25.87	1.04	9.965E-03	727.17	11.800	3.543E-01	BI212
768.11	56.	34.00	0.79	9.555E-03				
911.08	142.	13.34	1.59	8.401E-03	911.07	29.000	3.925E-01	AC228
968.68	110.	13.79	1.51	8.027E-03	968.90	17.460	5.389E-01	AC228
1066.15	47.	39.59	0.65	7.479E-03				
1120.42	116.	16.95	1.33	7.211E-03	1120.28	15.040	7.199E-01	BI214
1460.63	698.	3.92	1.79	5.932E-03	1460.75	10.700	7.351E+00	K40
1764.27	63.	12.31	2.09	5.142E-03	1764.51	15.920	5.267E-01	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
153.78	77.49	265.	153.	0.077	51.24	0.995	PB-214	lD
186.56	93.70	390.	80.	0.040	111.84	1.627	TH-227	l
1535.29	768.11	86.	56.	0.028	102.00	0.794	BI-214	s
2131.30	1066.15	68.	47.	0.023	118.76	0.649	-	s

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-212	148.79	74.81	229.	72.	0.036	91.23	0.993D
PB-212	153.39	77.11	265.	76.	0.038	86.74	0.995A
RA-226	371.86	186.35	486.	120.	0.060	74.05	1.500s
PB-212	476.54	238.69	487.	431.	0.216	26.91	1.099
RA-224	483.01	241.93	464.	124.	0.062	78.26	1.500
PB-214	482.82	241.83	254.	67.	0.033	103.16	0.948
PB-214	589.51	295.18	217.	265.	0.133	32.33	1.149
AC-228	675.70	338.28	101.	122.	0.061	43.83	1.614s
PB-214	702.92	351.89	236.	439.	0.220	23.39	1.085
SB-125	924.61	462.75	68.	55.	0.027	73.48	1.500
TL-208	1020.15	510.52	103.	106.	0.053	42.40	1.824s
TL-208	1165.29	583.10	64.	211.	0.105	26.66	1.211s
BI-214	1217.46	609.18	99.	322.	0.161	22.81	1.277
BI-212	1453.13	727.03	54.	41.	0.021	87.54	1.500
AC-228	1821.18	911.08	66.	139.	0.070	40.01	1.589s
AC-228	1936.38	968.68	40.	110.	0.055	41.36	1.512
BI-214	2239.82	1120.42	61.	114.	0.057	50.85	1.327
K-40	2920.12	1460.63	32.	679.	0.339	11.76	1.791
BI-214	3527.30	1764.27	3.	63.	0.031	36.93	2.087s

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	MDA Value pCi/gm	COMMENTS
BE-7		6.2176E-02					
			477.56	6.218E-02	%(	2.551E-01 7.54E-02	G
K-40		7.3507E+00					
			1460.75	7.351E+00	(P	3.158E-01 2.96E-01	G
MN-54		4.2638E-03					
			834.81	4.264E-03	&(P	2.321E-02 6.65E-03	G
CO-57		2.8106E-03					
			122.07	2.811E-03	&(P	3.999E-02 1.19E-02	G K
			136.43	9.626E-02	%	3.050E-01 9.18E-02	G
CO-60		5.3620E-03					
			1332.51	5.362E-03	&(P	2.726E-02 7.56E-03	G K
			1173.23	1.400E-02	% P	3.113E-02 9.30E-03	G K
Sr-85		-1.2587E-02					
			514.00	-1.259E-02	%(	3.086E-02 9.29E-03	G
Kr-85		-2.8412E+02					
			513.99	-2.841E+02	%(	6.969E+02 2.10E+02	G
Y-88		8.7701E-04					
			1836.01	8.770E-04	&(P	1.828E-02 4.52E-03	G K
			898.02	-5.770E-04	% P	2.156E-02 5.75E-03	G
NB-94		5.2459E-03					
			871.10	5.246E-03	%(	2.452E-02 7.09E-03	G K
			702.50	0.000E+00	&	2.880E-02 8.19E-03	G K
Ag-108M		-1.0886E-02					
			722.95	-1.089E-02	%(	3.795E-02 1.13E-02	G K
			614.37	-3.166E-03	% P	2.758E-02 7.95E-03	G
			433.93	1.294E-03	&	2.637E-02 7.63E-03	G
CD-109		6.9870E-01					
			88.04	6.987E-01	%(	1.498E+00 4.54E-01	G
SN-113		8.3056E-03					
			391.71	8.306E-03	%(	3.402E-02 1.01E-02	G K
			255.04	-3.543E-01	&	1.361E+00 4.07E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	7.8982E-02						
		427.95	1.620E-02	%(P	7.787E-02	2.29E-02	G K
		600.77	-4.590E-05	& P	1.504E-01	4.30E-02	G
		636.15	-6.104E-02	% P	2.283E-01	6.69E-02	G
		463.51	2.648E-01	(P	1.982E-01	6.64E-02	G
		176.29	-2.789E-02	%	4.613E-01	1.37E-01	G
I-131	-1.9450E-03						
		364.48	-1.945E-03	&(P	3.337E-02	9.67E-03	G K
		636.97	-2.759E-03	%	3.987E-01	1.13E-01	G
		284.29	-9.793E-02	% P	5.253E-01	1.56E-01	G
CS-134	-6.5261E-04						
		604.66	-6.526E-04	%(	7.585E-02	2.25E-02	G K
		795.76	1.533E-02	% P	2.648E-02	8.18E-03	G
		569.29	-7.078E-03	& P	1.453E-01	4.05E-02	G
		801.84	-1.290E-02	% P	2.906E-01	7.97E-02	G
CS-137	4.5947E-03						
		661.62	4.595E-03	%(P	3.256E-02	9.40E-03	G
CE-139	3.6632E-03						
		165.85	3.663E-03	&(	3.758E-02	1.12E-02	G
EU-152	7.6594E-03						
		121.78	7.659E-03	&(P	1.167E-01	3.47E-02	G K
		344.30	1.134E-02	% P	9.037E-02	2.66E-02	G
		1408.08	4.614E-02	%	1.015E-01	3.07E-02	G
		964.00	-5.174E-02	% P	2.267E-01	6.59E-02	G
		1112.07	-3.748E-02	%	2.251E-01	6.46E-02	G
		778.90	-5.960E-03	%	2.051E-01	5.79E-02	G
EU-154	2.2983E-03						
		123.10	2.298E-03	%(	8.941E-02	2.66E-02	G K
		1274.80	-1.128E-02	%	8.143E-02	2.30E-02	G
		723.30	-4.951E-02	%	1.710E-01	5.08E-02	G
		1004.80	2.149E-03	%	1.657E-01	4.63E-02	G
EU-155	8.2774E-02						
		86.45	8.277E-02	&(	1.872E-01	5.67E-02	G K
		105.31	5.102E-02	%	1.797E-01	5.40E-02	G
HG-203	-3.3185E-04						
		279.17	-3.319E-04	&(P	2.710E-02	7.89E-03	G K
		72.87	-1.955E-01	% P	1.800E+00	5.37E-01	G
		70.83	-1.087E+00	%	3.201E+00	9.64E-01	G
		82.50	-1.011E+00	%	3.169E+00	9.54E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	1.4217E-01						
		583.14	1.422E-01	@(P	2.704E-02	1.29E-02	G
		510.72	2.466E-01	+ P	1.158E-01	4.36E-02	G
PB-212	2.9659E-01						
		238.63	2.966E-01	(P	7.253E-02	2.73E-02	G K
							Energy duplication
		77.11	2.966E-01	} P	3.049E-01	8.58E-02	G
		74.81	5.724E-01	+ P	5.788E-01	1.82E-01	G
PB-214	4.6221E-01						
		351.99	4.585E-01	(P	7.748E-02	3.62E-02	G K
		295.22	4.693E-01	(P	1.260E-01	5.13E-02	G
							Energy duplication
		77.11	0.000E+00	} P	6.643E-01	0.00E+00	G
		241.92	2.662E-01	-	3.079E-01	9.14E-02	G
BI-212	2.4230E-01						
		727.17	2.423E-01	(P	2.168E-01	7.15E-02	G K
		1620.56	1.029E-01	& P	9.421E-01	2.58E-01	G
		785.42	0.000E+00	&	1.651E+00	4.71E-01	G
BI-214	4.1996E-01						
		609.32	4.200E-01	(P	6.394E-02	3.26E-02	G K
		1764.51	5.267E-01	+ P	9.354E-02	6.82E-02	G
		1120.28	7.199E-01	+ P	2.486E-01	1.24E-01	G
RA-224	9.4981E-01						
		241.00	9.498E-01	&(	7.874E-01	2.48E-01	G
RA-226	9.8060E-01						
		185.99	9.806E-01	@(P	8.607E-01	2.68E-01	G
AC-228	4.3390E-01						
		911.07	3.925E-01	@(P	1.143E-01	5.36E-02	G K
		968.90	5.389E-01	(P	1.581E-01	7.44E-02	G
		338.40	3.812E-01	(P	1.550E-01	5.62E-02	G
TH-227	-4.5607E-02						
		236.00	-4.561E-02	%(	2.664E-01	7.94E-02	G K
		256.25	-1.062E-01	& P	3.759E-01	1.12E-01	G
PA-234	1.7620E-02						
		98.44	1.762E-02	%(P	1.646E-01	4.90E-02	G K
		946.00	-1.556E-02	& P	1.393E-01	3.96E-02	G
		131.28	-3.266E-02	% P	1.755E-01	5.25E-02	G
		94.67	3.715E-03	% P	3.132E-01	9.30E-02	G
		883.24	3.152E-02	&	1.847E-01	5.26E-02	G
		926.70	0.000E+00	%	2.886E-01	8.14E-02	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26-1.087E-02 & P 2.154E-01 6.01E-02 G

TH-234       2.9440E-01
                           63.29 2.944E-01 &(P 5.135E+00 1.52E+00 G K
                           92.80 9.705E-01 % P 1.675E+00 5.07E-01 G
                           92.38 1.150E+00 & P 1.999E+00 6.05E-01 G

AM-241      -1.9500E-01
                           59.54-1.950E-01 &(P 8.893E-01 2.66E-01 G
```

(- This peak used in the nuclide activity average.

* - Peak is too wide, but only one peak in library.
! - Peak is part of a multiplet and this area went negative during deconvolution.
? - Peak is too narrow.
@ - Peak is too wide at FW25M, but ok at FWHM.
% - Peak fails sensitivity test.
$ - Peak identified, but first peak of this nuclide failed one or more qualification tests.
\+ - Peak activity higher than counting uncertainty range.
\- - Peak activity lower than counting uncertainty range.
= - Peak outside analysis energy range.
& - Calculated peak centroid is not close enough to the library energy centroid for positive identification.
P - Peakbackground subtraction
} - Peak is too close to another for the activity to be found directly.

Nuclide Codes:	Peak Codes:
T - Thermal Neutron Activation	G - Gamma Ray
F - Fast Neutron Activation	X - X-Ray
I - Fission Product	P - Positron Decay
N - Naturally Occurring Isotope	S - Single-Escape
P - Photon Reaction	D - Double-Escape
C - Charged Particle Reaction	K - Key Line
M - No MDA Calculation	A - Not in Average
R - Coincidence Corrected	C - Coincidence Peak
H - Halflife limit exceeded	

- -

***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	6.0534E-02	6.2176E-02	2.2630E-01	2.2633E-01	2.484E-01
K-40		7.3507E+00	7.3507E+00	8.8820E-01	9.8541E-01	
MN-54	#A	4.2443E-03	4.2638E-03	1.9938E-02	1.9939E-02	2.310E-02
CO-57	#B	2.7958E-03	2.8106E-03	3.5672E-02	3.5673E-02	3.978E-02
CO-60	#B	5.3580E-03	5.3620E-03	2.2684E-02	2.2686E-02	2.724E-02

Sr-85	#A	-1.2312E-02	-1.2587E-02	2.7885E-02	2.7894E-02	3.019E-02
Kr-85	#A	-2.8412E+02	-2.8412E+02	6.2967E+02	6.2988E+02	6.969E+02
Y-88	#B	8.6533E-04	8.7701E-04	1.3548E-02	1.3548E-02	1.804E-02
NB-94	#B	5.2459E-03	5.2459E-03	2.1266E-02	2.1268E-02	2.452E-02
Ag-108M	#B	-1.0885E-02	-1.0886E-02	3.3796E-02	3.3802E-02	3.795E-02
CD-109	#A	6.9650E-01	6.9870E-01	1.3623E+00	1.3628E+00	1.493E+00
SN-113	#B	8.2031E-03	8.3056E-03	3.0171E-02	3.0175E-02	3.360E-02
SB-125	#F	7.8871E-02	7.8982E-02	5.9385E-02	5.9562E-02	7.776E-02
I-131	#B	-1.6282E-03	-1.9450E-03	4.4045E-02	4.4045E-02	2.794E-02
CS-134	#B	-6.5138E-04	-6.5261E-04	6.7569E-02	6.7569E-02	7.570E-02
CS-137	#A	4.5941E-03	4.5947E-03	2.8209E-02	2.8210E-02	3.256E-02
CE-139	#A	3.6253E-03	3.6632E-03	3.3555E-02	3.3555E-02	3.719E-02
EU-152	#B	7.6570E-03	7.6594E-03	1.0410E-01	1.0410E-01	1.167E-01
EU-154	#B	2.2972E-03	2.2983E-03	7.9723E-02	7.9723E-02	8.937E-02
EU-155	#B	8.2709E-02	8.2774E-02	1.7007E-01	1.7013E-01	1.871E-01
HG-203	#B	-3.2183E-04	-3.3185E-04	2.6067E-02	2.6067E-02	2.628E-02
TL-208	#	1.4217E-01	1.4217E-01	3.8675E-02	3.9546E-02	
PB-212		2.9659E-01	2.9659E-01	8.2041E-02	8.3828E-02	
PB-214		4.6221E-01	4.6221E-01	9.3545E-02	9.7318E-02	
BI-212	#	2.4230E-01	2.4230E-01	2.1464E-01	2.1510E-01	2.168E-01
BI-214		4.1996E-01	4.1996E-01	9.7722E-02	1.0072E-01	
RA-224	#	9.4981E-01	9.4981E-01	7.4335E-01	7.4539E-01	7.874E-01
RA-226	#	9.8059E-01	9.8060E-01	8.0447E-01	8.0649E-01	8.607E-01
AC-228		4.3390E-01	4.3390E-01	1.0580E-01	1.0876E-01	
TH-227	#B	-4.5607E-02	-4.5607E-02	2.3830E-01	2.3831E-01	2.664E-01
PA-234	#B	1.7620E-02	1.7620E-02	1.4691E-01	1.4691E-01	1.646E-01
TH-234	#B	2.9440E-01	2.9440E-01	4.5606E+00	4.5606E+00	5.135E+00
AM-241	#A	-1.9500E-01	-1.9500E-01	8.1180E-01	8.1187E-01	8.893E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (87.4 to 2000.7 keV) 9.1055241E+00 pCi/gm
Total Decayed Activity (87.4 to 2000.7 keV) 9.1055241E+00 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JPK

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 103F_11SEPT2006_1139.An1

Sample description
FSS-OOL-05-10-018-F-A

Spectrum Filename: C:\GammaVision\Spectra\103F_11SEPT2006_1139.An1

Acquisition information
Start time: 11-Sep-2006 11:40:06
Live time: 2000
Real time: 2001
Dead time: 0.05 %
Detector ID: 4

Detector system
Det 103 - DSPE-471

Calibration
Filename: D3_1LSa.Clb
Detector_103 1.0 Liter Sand Geometry

Energy Calibration
Created: 08-Aug-2005 11:09:41
Zero offset: 0.409 keV
Gain: 0.500 keV/channel
Quadratic: 1.092E-08 keV/channel^2

Efficiency Calibration
Created: 08-Aug-2005 11:11:25
Type: Polynomial
Uncertainty: 0.993 %
Coefficients: -0.264059 -5.138468 0.638383
-0.089199 0.005011 -0.000129

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.41keV)
Stop channel: 4000 (2000.67keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 1.2300E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.2300E+03) =
8.1301E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	09-Sep-2006 13:55:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	103_150K_05AUG05.Pbc 08-Aug-2005 12:54:15
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 10 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.0451

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
74.93	54.	32.77	0.99	9.104E-03	74.81	9.600	PBC<MDA	PB212
77.11	55.	35.86	1.50	1.011E-02	77.11	10.700	PBC<MDA	PB214
					77.11	17.500	PBC<MDA	PB212
77.12	25.	4.33	0.99	1.011E-02	77.11	10.700	1.002E+00	PB214
					77.11	17.500	6.125E-01	PB212
92.74	72.	34.49	1.27	1.643E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
186.06	115.	19.89	1.01	2.566E-02	185.99	3.280	1.334E+00	RA226
238.64	242.	8.20	1.09	2.319E-02	238.63	43.100	2.531E-01	PB212
241.98	103.	16.69	1.10	2.301E-02	241.00	3.900	1.257E+00	RA224
					241.92	7.470	6.575E-01	PB214
295.24	165.	13.80	1.02	2.025E-02	295.22	19.200	4.548E-01	PB214
338.51	61.	24.19	0.89	1.830E-02	338.40	12.010	3.004E-01	AC228
351.85	342.	7.48	1.26	1.776E-02	351.99	37.100	5.611E-01	PB214
510.84	17.	26.16	1.50	1.317E-02	510.72	22.500	PBC<MDA	TL208
583.17	90.	19.89	1.10	1.184E-02	583.14	86.000	9.232E-02	TL208
609.33	254.	7.77	1.23	1.144E-02	609.32	46.090	5.166E-01	BI214
910.59	70.	15.87	1.56	8.405E-03				
910.59	70.	15.87	1.56	8.405E-03	911.07	29.000	3.000E-01	AC228
967.60	70.	17.52	1.40	8.034E-03				
969.10	31.	28.74	1.54	8.026E-03				
969.10	31.	28.74	1.54	8.026E-03	968.90	17.460	2.417E-01	AC228
1120.32	71.	16.98	1.67	7.212E-03	1120.28	15.040	7.020E-01	BI214
1460.82	300.	5.85	1.82	5.932E-03	1460.75	10.700	4.864E+00	K40
1764.59	57.	13.25	2.04	5.142E-03	1764.51	15.920	7.211E-01	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
149.04	74.92	130.	54.	0.027	98.30	0.993	PB-214	D
1934.22	967.60	22.	70.	0.035	52.56	1.397	SB-124	l

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-214	153.39	77.11	320.	55.	0.028	107.57	1.500A
PB-212	153.39	77.11	137.	25.	0.013	12.98	0.995A
RA-226	371.65	186.25	212.	95.	0.047	62.64	1.500
PB-212	476.55	238.70	183.	143.	0.072	42.40	0.979
RA-224	482.99	241.92	237.	106.	0.053	67.93	1.500
PB-214	484.31	242.58	292.	71.	0.036	107.87	1.500
PB-214	589.64	295.24	140.	161.	0.080	41.41	1.025
AC-228	676.09	338.47	83.	57.	0.028	77.09	1.500
PB-214	702.84	351.85	110.	336.	0.168	22.43	1.257
TL-208	1165.42	583.16	48.	59.	0.029	58.57	1.500
BI-214	1217.75	609.33	55.	248.	0.124	23.30	1.232
AC-228	1821.47	911.22	23.	49.	0.024	55.09	1.505s
AC-228	1937.22	969.10	24.	31.	0.015	86.23	1.541s
BI-214	2239.62	1120.32	23.	69.	0.035	50.93	1.671
K-40	2920.51	1460.82	21.	281.	0.140	17.55	1.816
BI-214	3527.93	1764.59	3.	54.	0.027	39.74	2.040

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	MDA Value pCi/gm	COMMENTS
BE-7		5.4577E-02					
			477.56	5.458E-02	%(	2.971E-01 8.62E-02	G
K-40		4.8635E+00					
			1460.75	4.864E+00	(P	4.167E-01 3.03E-01	G
MN-54		-5.3208E-03					
			834.81	-5.321E-03	&(P	4.001E-02 1.13E-02	G
CO-57		4.4658E-04					
			122.07	4.466E-04	%(P	4.715E-02 1.39E-02	G K
			136.43	1.840E-02	%	2.938E-01 8.62E-02	G
CO-60		-6.8544E-03					
			1332.51	-6.854E-03	%(P	3.870E-02 9.72E-03	G K
			1173.23	-4.568E-03	% P	3.365E-02 8.49E-03	G K
Sr-85		-1.3793E-02					
			514.00	-1.379E-02	%(	4.137E-02 1.23E-02	G
Kr-85		-3.1199E+02					
			513.99	-3.120E+02	%(	9.357E+02 2.79E+02	G
Y-88		5.3447E-03					
			1836.01	5.345E-03	%(P	2.795E-02 7.47E-03	G K
			898.02	-1.509E-03	% P	3.695E-02 9.99E-03	G
NB-94		2.3222E-03					
			871.10	2.322E-03	%(	3.104E-02 8.55E-03	G K
			702.50	3.722E-03	&	2.543E-02 7.12E-03	G K
Ag-108M		-5.6871E-03					
			722.95	-5.687E-03	%(	3.512E-02 1.00E-02	G K
			614.37	-1.638E-02	% P	3.911E-02 1.17E-02	G
			433.93	-1.710E-03	%	2.691E-02 7.59E-03	G
CD-109		4.2043E-02					
			88.04	4.204E-02	%(	1.891E+00 5.58E-01	G
SN-113		8.7642E-03					
			391.71	8.764E-03	%(	4.458E-02 1.30E-02	G K
			255.04	-2.806E-01	%	1.577E+00 4.66E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	-9.1300E-05						
		427.95	-9.130E-05	&(P	9.094E-02	2.56E-02	G K
		600.77	-7.335E-05	% P	2.175E-01	6.17E-02	G
		636.15	4.240E-02	& P	2.387E-01	6.76E-02	G
		463.51	8.767E-02	% P	2.785E-01	8.19E-02	G
		176.29	-1.305E-01	%	5.518E-01	1.65E-01	G
I-131	1.3865E-03						
		364.48	1.387E-03	%(P	4.301E-02	1.23E-02	G K
		636.97	-7.709E-02	%	5.885E-01	1.69E-01	G
		284.29	1.052E-01	& P	5.483E-01	1.61E-01	G
CS-134	1.1073E-02						
		604.66	1.107E-02	%(	2.687E-02	8.05E-03	G K
		795.76	1.325E-02	% P	2.719E-02	8.29E-03	G
		569.29	-1.031E-02	% P	2.086E-01	5.74E-02	G
		801.84	9.318E-02	& P	3.318E-01	9.47E-02	G
CS-137	4.4959E-03						
		661.62	4.496E-03	%(P	3.261E-02	9.09E-03	G
CE-139	-2.2663E-03						
		165.85	-2.266E-03	%(	4.440E-02	1.31E-02	G
EU-152	4.6281E-04						
		121.78	4.628E-04	%(P	1.377E-01	4.05E-02	G K
		344.30	-1.316E-02	% P	1.011E-01	2.93E-02	G
		1408.08	2.431E-02	&	1.868E-01	5.17E-02	G
		964.00	1.001E-01	% P	2.860E-01	8.45E-02	G
		1112.07	5.464E-02	%	2.426E-01	6.90E-02	G
		778.90	2.256E-03	&	2.256E-01	6.13E-02	G
EU-154	-6.9616E-03						
		123.10	-6.962E-03	&(	1.018E-01	3.01E-02	G K
		1274.80	-9.377E-04	%	1.138E-01	3.07E-02	G
		723.30	-1.450E-03	%	1.318E-01	3.55E-02	G
		1004.80	-3.877E-02	%	2.249E-01	6.41E-02	G
EU-155	4.9969E-02						
		86.45	4.997E-02	%(	1.674E-01	5.00E-02	G K
		105.31	5.100E-02	%	2.012E-01	6.01E-02	G
HG-203	1.2132E-02						
		279.17	1.213E-02	&(P	3.575E-02	1.07E-02	G K
		72.87	-2.148E-01	& P	1.956E+00	5.79E-01	G
		70.83	2.420E-01	%	3.882E+00	1.15E+00	G
		82.50	-7.546E-01	&	3.516E+00	1.05E+00	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	6.3301E-02						
		583.14	6.330E-02	(P	3.791E-02	1.33E-02	G
		510.72	6.339E-02	% P	1.549E-01	4.25E-02	G
PB-212	1.5717E-01						
		238.63	1.572E-01	(P	7.224E-02	2.41E-02	G K
							Energy duplication
		77.11	1.572E-01	} P	3.556E-01	6.80E-03	G
		74.81	3.933E-01	% P	1.124E+00	3.37E-01	G
PB-214	5.6108E-01						
		351.99	5.611E-01	(P	8.591E-02	4.26E-02	G K
		295.22	4.548E-01	- P	1.635E-01	6.44E-02	G
							Energy duplication
		77.11	5.611E-01	} P	8.740E-01	2.01E-01	G
		241.92	4.544E-01	-	5.256E-01	1.63E-01	G
BI-212	1.0127E-01						
		727.17	1.013E-01	%(P	2.508E-01	7.47E-02	G K
		1620.56	1.674E-01	% P	9.495E-01	2.53E-01	G
		785.42	4.643E-01	%	1.273E+00	3.76E-01	G
BI-214	5.1664E-01						
		609.32	5.166E-01	(P	7.771E-02	4.12E-02	G K
		1764.51	7.211E-01	+ P	1.495E-01	1.01E-01	G
		1120.28	7.020E-01	+ P	2.523E-01	1.22E-01	G
RA-224	1.2983E+00						
		241.00	1.298E+00	&(	9.083E-01	2.94E-01	G
RA-226	1.2378E+00						
		185.99	1.238E+00	(P	9.217E-01	2.94E-01	G
AC-228	2.3934E-01						
		911.07	2.192E-01	@(P	1.128E-01	4.30E-02	G K
		968.90	2.417E-01	@(P	2.013E-01	6.98E-02	G
		338.40	2.846E-01	(P	2.261E-01	7.45E-02	G
TH-227	2.1174E-02						
		236.00	2.117E-02	%(	2.653E-01	7.76E-02	G K
		256.25	1.241E-01	% P	4.507E-01	1.34E-01	G
PA-234	4.1982E-03						
		98.44	4.198E-03	%(P	1.883E-01	5.52E-02	G K
		946.00	3.021E-03	& P	1.545E-01	4.16E-02	G
		131.28	1.663E-03	% P	1.835E-01	5.39E-02	G
		94.67	-1.466E-02	% P	3.465E-01	1.02E-01	G
		883.24	3.079E-02	&	2.048E-01	5.64E-02	G
		926.70	5.263E-02	&	2.733E-01	7.73E-02	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26-1.470E-02 % P 3.014E-01 8.27E-02 G

TH-234       3.7833E-01
                           63.29 3.783E-01 %(P 5.826E+00 1.71E+00 G K
                           92.80 1.255E+00 % P 1.792E+00 5.43E-01 G
                           92.38 1.422E+00 % P 2.136E+00 6.47E-01 G

AM-241       1.8628E-02
                           59.54 1.863E-02 &(P 9.463E-01 2.77E-01 G
   ( - This peak used in the nuclide activity average.

   * - Peak is too wide, but only one peak in library.
   ! - Peak is part of a multiplet and this area went
       negative during deconvolution.
   ? - Peak is too narrow.
   @ - Peak is too wide at FW25M, but ok at FWHM.
   % - Peak fails sensitivity test.
   $ - Peak identified, but first peak of this nuclide
       failed one or more qualification tests.
   + - Peak activity higher than counting uncertainty range.
   - - Peak activity lower than counting uncertainty range.
   = - Peak outside analysis energy range.
   & - Calculated peak centroid is not close enough to the
       library energy centroid for positive identification.
   P - Peakbackground subtraction
   } - Peak is too close to another for the activity
       to be found directly.

   Nuclide Codes:                      Peak Codes:
   T - Thermal Neutron Activation      G - Gamma Ray
   F - Fast Neutron Activation         X - X-Ray
   I - Fission Product                 P - Positron Decay
   N - Naturally Occurring Isotope     S - Single-Escape
   P - Photon Reaction                 D - Double-Escape
   C - Charged Particle Reaction       K - Key Line
   M - No MDA Calculation              A - Not in Average
   R - Coincidence Corrected           C - Coincidence Peak
   H - Halflife limit exceeded

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
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***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	5.3243E-02	5.4577E-02	2.5868E-01	2.5870E-01	2.898E-01
K-40		4.8635E+00	4.8635E+00	9.1028E-01	9.5307E-01	
MN-54	#A	-5.2984E-03	-5.3208E-03	4.0187E-02	4.0188E-02	3.984E-02
CO-57	#B	4.4440E-04	4.4658E-04	4.1580E-02	4.1580E-02	4.692E-02
CO-60	#B	-6.8497E-03	-6.8544E-03	1.4694E-01	1.4694E-01	3.867E-02

Sr-85	#A	-1.3515E-02	-1.3793E-02	3.7010E-02	3.7019E-02	4.053E-02
Kr-85	#A	-3.1199E+02	-3.1199E+02	8.3718E+02	8.3737E+02	9.357E+02
Y-88	#B	5.2788E-03	5.3447E-03	2.2396E-02	2.2398E-02	2.761E-02
NB-94	#B	2.3222E-03	2.3222E-03	2.5658E-02	2.5658E-02	3.104E-02
Ag-108M	#B	-5.6870E-03	-5.6871E-03	3.0036E-02	3.0038E-02	3.512E-02
CD-109	#A	4.1920E-02	4.2043E-02	1.6754E+00	1.6754E+00	1.886E+00
SN-113	#B	8.6642E-03	8.7642E-03	3.9058E-02	3.9061E-02	4.407E-02
SB-125	#B	-9.1181E-05	-9.1300E-05	5.7292E-03	5.7292E-03	9.082E-02
I-131	#B	1.1764E-03	1.3865E-03	3.6971E-02	3.6971E-02	3.650E-02
CS-134	#B	1.1053E-02	1.1073E-02	2.4160E-02	2.4168E-02	2.682E-02
CS-137	#A	4.4954E-03	4.4959E-03	2.7271E-02	2.7273E-02	3.261E-02
CE-139	#A	-2.2447E-03	-2.2663E-03	3.9249E-02	3.9249E-02	4.398E-02
EU-152	#B	4.6268E-04	4.6281E-04	1.2139E-01	1.2139E-01	1.377E-01
EU-154	#B	-6.9587E-03	-6.9616E-03	9.0284E-02	9.0285E-02	1.018E-01
EU-155	#B	4.9933E-02	4.9969E-02	1.5010E-01	1.5012E-01	1.672E-01
HG-203	#B	1.1793E-02	1.2132E-02	3.2062E-02	3.2070E-02	3.475E-02
TL-208	#	6.3301E-02	6.3301E-02	3.9797E-02	3.9967E-02	3.791E-02
PB-212		1.5717E-01	1.5717E-01	7.2214E-02	7.2788E-02	
PB-214		5.6108E-01	5.6108E-01	1.2798E-01	1.3206E-01	
BI-212	#B	1.0127E-01	1.0127E-01	2.2421E-01	2.2428E-01	2.508E-01
BI-214		5.1664E-01	5.1664E-01	1.2353E-01	1.2712E-01	
RA-224	#	1.2983E+00	1.2983E+00	8.8185E-01	8.8507E-01	9.083E-01
RA-226	#	1.2378E+00	1.2378E+00	8.8126E-01	8.8419E-01	9.217E-01
AC-228	#	2.3934E-01	2.3934E-01	1.0447E-01	1.0539E-01	1.128E-01
TH-227	#B	2.1174E-02	2.1174E-02	2.3291E-01	2.3291E-01	2.653E-01
PA-234	#B	4.1982E-03	4.1982E-03	1.6563E-01	1.6563E-01	1.883E-01
TH-234	#B	3.7833E-01	3.7833E-01	5.1175E+00	5.1175E+00	5.826E+00
AM-241	#A	1.8628E-02	1.8628E-02	8.2955E-01	8.2955E-01	9.463E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (86.9 to 2000.7 keV) 6.0984273E+00 pCi/gm
Total Decayed Activity (86.9 to 2000.7 keV) 6.0984273E+00 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JPK

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 103F_11SEPT2006_1455.An1

Sample description
FSS-OOL-05-10-013-F-A

Spectrum Filename: C:\GammaVision\Spectra\103F_11SEPT2006_1455.An1

Acquisition information
Start time: 11-Sep-2006 14:55:14
Live time: 2000
Real time: 2001
Dead time: 0.05 %
Detector ID: 4

Detector system
Det 103 - DSPE-471

Calibration
Filename: D3_1LSa.Clb
Detector_103 1.0 Liter Sand Geometry

Energy Calibration
Created: 08-Aug-2005 11:09:41
Zero offset: 0.409 keV
Gain: 0.500 keV/channel
Quadratic: 1.092E-08 keV/channel^2

Efficiency Calibration
Created: 08-Aug-2005 11:11:25
Type: Polynomial
Uncertainty: 0.993 %
Coefficients: -0.264059 -5.138468 0.638383
-0.089199 0.005011 -0.000129

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.41keV)
Stop channel: 4000 (2000.67keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 1.3200E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.3200E+03) =
7.5758E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	09-Sep-2006 11:33:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	103_150K_05AUG05.Pbc 08-Aug-2005 12:54:15
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 12 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.0719

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
92.20	76.	37.44	1.55	1.624E-02				
92.20	76.	37.44	1.55	1.624E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
186.47	107.	20.63	1.27	2.565E-02	185.99	3.280	1.149E+00	RA226
238.69	281.	7.59	1.09	2.321E-02	238.63	43.100	2.750E-01	PB212
					241.92	7.470	1.670E+00	PB214
295.27	210.	8.41	1.13	2.025E-02	295.22	19.200	5.419E-01	PB214
299.92	32.	35.32	1.13	2.002E-02				
338.37	58.	21.93	1.09	1.830E-02				
338.37	58.	21.93	1.09	1.830E-02	338.40	12.010	2.655E-01	AC228
351.96	386.	6.74	0.89	1.775E-02	351.99	37.100	5.920E-01	PB214
511.38	99.	16.00	2.31	1.316E-02	510.72	22.500	2.498E-01	TL208
					513.99	0.004	1.799E+03	Kr85
					514.00	99.270	7.971E-02	Sr85
583.28	95.	15.05	1.09	1.184E-02	583.14	86.000	9.155E-02	TL208
609.38	273.	6.82	1.16	1.144E-02	609.32	46.090	5.183E-01	BI214
911.32	50.	17.89	0.65	8.400E-03	911.07	29.000	1.960E-01	AC228
968.90	25.	39.15	1.54	8.026E-03	968.90	17.460	PBC<MDA	AC228
1120.17	73.	16.15	1.48	7.212E-03	1120.28	15.040	6.711E-01	BI214
1460.92	297.	6.00	2.14	5.931E-03	1460.75	10.700	4.485E+00	K40
1764.89	59.	13.02	0.79	5.141E-03	1764.51	15.920	6.970E-01	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide

483.91	242.17	102.	81.	0.041	62.27	1.095	PB-214	lD
598.94	299.89	67.	37.	0.018	110.77	0.697	TH-227	s

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
RA-226	372.11	186.47	196.	94.	0.047	61.89	1.268s
PB-212	476.12	238.48	253.	192.	0.096	41.09	1.096
PB-214	476.44	238.64	247.	123.	0.061	60.81	1.500s
PB-214	589.64	295.25	77.	198.	0.099	27.92	1.107
AC-228	675.87	338.36	69.	48.	0.024	83.90	1.500
PB-214	703.07	351.96	100.	381.	0.190	20.23	0.891
TL-208	1021.87	511.38	73.	72.	0.036	47.99	2.315s
TL-208	1165.67	583.28	44.	91.	0.046	45.16	1.091
BI-214	1217.85	609.38	40.	267.	0.133	20.45	1.158
AC-228	1821.66	911.32	18.	31.	0.016	69.84	1.505s
AC-228	1936.81	968.90	36.	25.	0.012	117.45	1.541s
BI-214	2239.32	1120.17	24.	71.	0.036	48.45	1.480s
K-40	2920.71	1460.92	26.	278.	0.139	18.00	2.144
BI-214	3528.79	1765.02	11.	30.	0.015	63.14	2.033s

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

Nuclide Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Code	MDA Value pCi/gm	COMMENTS
BE-7		5.2449E-02					
			477.56	5.245E-02	%(	2.821E-01	8.19E-02 G
K-40		4.4852E+00					
			1460.75	4.485E+00	(P	4.264E-01	2.87E-01 G
MN-54		-7.9784E-04					
			834.81	-7.978E-04	%(P	3.411E-02	9.38E-03 G
CO-57		-4.2805E-03					
			122.07	-4.280E-03	%(P	4.443E-02	1.31E-02 G K
			136.43	-5.697E-02	%	3.319E-01	9.87E-02 G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CO-60	-4.3328E-03						
		1332.51	-4.333E-03	&(P	3.812E-02	9.55E-03	G K
		1173.23	-4.654E-03	& P	4.172E-02	1.12E-02	G K
Sr-85	-6.8986E-03						
		514.00	-6.899E-03	%(	3.582E-02	1.05E-02	G
Kr-85	-1.5569E+02						
		513.99	-1.557E+02	%(	8.083E+02	2.36E+02	G
Y-88	-1.3197E-04						
		1836.01	-1.320E-04	%(P	4.609E-02	1.22E-02	G K
		898.02	-3.795E-03	% P	3.170E-02	8.65E-03	G
NB-94	0.0000E+00						
		871.10	0.000E+00	%(	2.350E-02	6.16E-03	G K
		702.50	-2.623E-03	%	2.573E-02	7.17E-03	G K
Ag-108M	6.1535E-04						
		722.95	6.153E-04	&(	3.372E-02	9.34E-03	G K
		614.37	-3.026E-02	& P	4.337E-02	1.35E-02	G
		433.93	-6.359E-03	%	3.221E-02	9.41E-03	G
CD-109	3.5516E-01						
		88.04	3.552E-01	&(	1.402E+00	4.18E-01	G
SN-113	-1.3636E-02						
		391.71	-1.364E-02	%(	4.609E-02	1.37E-02	G K
		255.04	1.684E-01	&	1.436E+00	4.22E-01	G
SB-125	-1.6749E-02						
		427.95	-1.675E-02	%(P	1.094E-01	3.19E-02	G K
		600.77	1.168E-02	& P	1.512E-01	4.26E-02	G
		636.15	-5.387E-03	& P	2.304E-01	6.25E-02	G
		463.51	1.635E-01	% P	2.582E-01	7.97E-02	G
		176.29	4.638E-02	%	5.126E-01	1.51E-01	G
I-131	1.3009E-02						
		364.48	1.301E-02	%(P	3.313E-02	9.90E-03	G K
		636.97	-5.573E-02	&	4.140E-01	1.17E-01	G
		284.29	-1.351E-02	& P	5.663E-01	1.64E-01	G
CS-134	9.7207E-04						
		604.66	9.721E-04	&(	8.621E-02	2.54E-02	G K
		795.76	-1.606E-04	% P	3.876E-02	1.07E-02	G
		569.29	-3.440E-03	% P	2.149E-01	6.01E-02	G
		801.84	-1.652E-02	& P	4.126E-01	1.13E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CS-137	1.2389E-03						
		661.62	1.239E-03	%(P	2.870E-02	7.76E-03	G
CE-139	1.3426E-02						
		165.85	1.343E-02	&(	3.544E-02	1.07E-02	G
EU-152	-1.4089E-02						
		121.78	-1.409E-02	%(P	1.299E-01	3.84E-02	G K
		344.30	1.676E-02	& P	1.015E-01	2.97E-02	G
		1408.08	2.837E-02	%	1.612E-01	4.50E-02	G
		964.00	-5.935E-02	% P	2.950E-01	8.47E-02	G
		1112.07	-6.538E-03	&	2.092E-01	5.55E-02	G
		778.90	-3.960E-02	%	2.502E-01	7.14E-02	G
EU-154	-1.8876E-03						
		123.10	-1.888E-03	&(	9.808E-02	2.89E-02	G K
		1274.80	-9.547E-03	%	1.007E-01	2.77E-02	G
		723.30	3.211E-04	&	1.492E-01	4.10E-02	G
		1004.80	9.999E-04	&	1.669E-01	4.46E-02	G
EU-155	3.4434E-02						
		86.45	3.443E-02	%(	2.134E-01	6.35E-02	G K
		105.31	-8.475E-04	%	1.797E-01	5.26E-02	G
HG-203	8.4277E-03						
		279.17	8.428E-03	&(P	3.513E-02	1.04E-02	G K
		72.87	7.134E-01	& P	1.784E+00	5.38E-01	G
		70.83	4.455E-02	%	4.531E+00	1.34E+00	G
		82.50	-6.611E-01	%	3.731E+00	1.11E+00	G
TL-208	9.1550E-02						
		583.14	9.155E-02	(P	3.376E-02	1.44E-02	G
		510.72	2.498E-01	+ P	1.466E-01	5.47E-02	G
PB-212	1.9683E-01						
		238.63	1.968E-01	(P	7.863E-02	2.86E-02	G K
							Energy duplication
		77.11	1.968E-01	} P	3.665E-01	9.40E-02	G
		74.81	2.044E-01	% P	1.202E+00	3.58E-01	G
PB-214	5.6823E-01						
		351.99	5.920E-01	(P	7.670E-02	4.05E-02	G K
		295.22	5.223E-01	(P	1.146E-01	4.96E-02	G
							Energy duplication
		77.11	0.000E+00	} P	8.419E-01	0.00E+00	G
		241.92	7.295E-01	+	4.523E-01	1.48E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
BI-212	1.5091E-01						
		727.17	1.509E-01	%(P	2.332E-01	7.30E-02	G K
		1620.56	1.224E-01	% P	9.584E-01	2.52E-01	G
		785.42	2.293E-01	&	1.507E+00	4.27E-01	G
BI-214	5.1830E-01						
		609.32	5.183E-01	(P	6.254E-02	3.62E-02	G K
		1764.51	3.718E-01	- P	2.263E-01	8.69E-02	G
		1120.28	6.711E-01	+ P	2.406E-01	1.11E-01	G
RA-224	0.0000E+00						
		241.00	0.000E+00	&(	8.362E-01	2.44E-01	G
RA-226	1.1485E+00						
		185.99	1.149E+00	*(P	8.254E-01	2.70E-01	G
AC-228	1.6468E-01						
		911.07	1.309E-01	(P	9.535E-02	3.38E-02	G K
		968.90	1.816E-01	*(P	2.228E-01	7.15E-02	G
		338.40	2.216E-01	(P	1.935E-01	6.34E-02	G
TH-227	-9.1087E-02						
		236.00	-9.109E-02	%(	3.025E-01	9.06E-02	G K
		256.25	1.089E-01	% P	4.320E-01	1.28E-01	G
PA-234	-1.9854E-02						
		98.44	-1.985E-02	%(P	1.979E-01	5.85E-02	G K
		946.00	1.752E-02	& P	1.305E-01	3.60E-02	G
		131.28	-1.538E-03	% P	1.761E-01	5.17E-02	G
		94.67	2.318E-03	% P	3.139E-01	9.21E-02	G
		883.24	1.625E-03	%	2.210E-01	5.91E-02	G
		926.70	-7.998E-03	&	2.792E-01	7.61E-02	G
		569.26	-5.094E-03	% P	3.182E-01	8.90E-02	G
TH-234	1.1408E+00						
		63.29	1.141E+00	%(P	6.417E+00	1.90E+00	G K
		92.80	1.034E+00	% P	1.894E+00	5.70E-01	G
		92.38	1.159E+00	% P	2.324E+00	6.98E-01	G
AM-241	-2.5167E-02						
		59.54	-2.517E-02	%(P	1.050E+00	3.09E-01	G

(- This peak used in the nuclide activity average.

* - Peak is too wide, but only one peak in library.
! - Peak is part of a multiplet and this area went negative during deconvolution.

? - Peak is too narrow.
@ - Peak is too wide at FW25M, but ok at FWHM.
% - Peak fails sensitivity test.
$ - Peak identified, but first peak of this nuclide failed one or more qualification tests.
+ - Peak activity higher than counting uncertainty range.
- - Peak activity lower than counting uncertainty range.
= - Peak outside analysis energy range.
& - Calculated peak centroid is not close enough to the library energy centroid for positive identification.
P - Peakbackground subtraction
} - Peak is too close to another for the activity to be found directly.

Nuclide Codes:
T - Thermal Neutron Activation
F - Fast Neutron Activation
I - Fission Product
N - Naturally Occurring Isotope
P - Photon Reaction
C - Charged Particle Reaction
M - No MDA Calculation
R - Coincidence Corrected
H - Halflife limit exceeded

Peak Codes:
G - Gamma Ray
X - X-Ray
P - Positron Decay
S - Single-Escape
D - Double-Escape
K - Key Line
A - Not in Average
C - Coincidence Peak

- -

***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	5.1011E-02	5.2449E-02	2.4584E-01	2.4586E-01	2.743E-01
K-40		4.4852E+00	4.4852E+00	8.6145E-01	8.9995E-01	
MN-54	#A	-7.9405E-04	-7.9784E-04	8.7767E-02	8.7767E-02	3.395E-02
CO-57	#B	-4.2570E-03	-4.2805E-03	4.3693E-02	4.3693E-02	4.419E-02
CO-60	#B	-4.3294E-03	-4.3328E-03	4.0286E+00	4.0286E+00	3.810E-02
Sr-85	#A	-6.7425E-03	-6.8986E-03	3.1433E-02	3.1436E-02	3.501E-02
Kr-85	#A	-1.5568E+02	-1.5569E+02	7.0927E+02	7.0932E+02	8.083E+02
Y-88	#B	-1.3015E-04	-1.3197E-04	4.6251E-03	4.6252E-03	4.545E-02
NB-94	#B	0.0000E+00	0.0000E+00	1.8488E-02	1.8488E-02	2.350E-02
Ag-108M	#B	6.1533E-04	6.1535E-04	2.8022E-02	2.8022E-02	3.372E-02
CD-109	#A	3.5400E-01	3.5516E-01	1.2546E+00	1.2547E+00	1.397E+00
SN-113	#B	-1.3462E-02	-1.3636E-02	4.1027E-02	4.1035E-02	4.550E-02
SB-125	#B	-1.6725E-02	-1.6749E-02	9.6750E-02	9.6754E-02	1.093E-01
I-131	#B	1.0817E-02	1.3009E-02	2.9698E-02	2.9707E-02	2.755E-02
CS-134	#B	9.7015E-04	9.7207E-04	7.6292E-02	7.6292E-02	8.605E-02
CS-137	#A	1.2387E-03	1.2389E-03	2.3278E-02	2.3278E-02	2.870E-02
CE-139	#A	1.3282E-02	1.3426E-02	3.1996E-02	3.2006E-02	3.506E-02
EU-152	#B	-1.4085E-02	-1.4089E-02	1.4115E-01	1.4115E-01	1.299E-01
EU-154	#B	-1.8867E-03	-1.8876E-03	8.6753E-02	8.6753E-02	9.803E-02
EU-155	#B	3.4406E-02	3.4434E-02	1.9064E-01	1.9065E-01	2.132E-01

HG-203 #B	8.1636E-03	8.4277E-03	3.1218E-02	3.1222E-02	3.403E-02

TL-208	9.1550E-02	9.1550E-02	4.3303E-02	4.3628E-02	
PB-212	1.9683E-01	1.9683E-01	8.5904E-02	8.6660E-02	
PB-214	5.6823E-01	5.6823E-01	9.9780E-02	1.0509E-01	
BI-212 #B	1.5091E-01	1.5091E-01	2.1886E-01	2.1904E-01	2.332E-01
BI-214	5.1830E-01	5.1830E-01	1.0856E-01	1.1265E-01	
RA-224 #A	0.0000E+00	0.0000E+00	7.3320E-01	7.3320E-01	8.362E-01
RA-226 #	1.1485E+00	1.1485E+00	8.0827E-01	8.1101E-01	
AC-228 #	1.6468E-01	1.6468E-01	9.0721E-02	9.1223E-02	9.535E-02
TH-227 #B	-9.1087E-02	-9.1087E-02	2.7168E-01	2.7173E-01	3.025E-01
PA-234 #B	-1.9854E-02	-1.9854E-02	2.1934E-01	2.1934E-01	1.979E-01
TH-234 #B	1.1408E+00	1.1408E+00	5.7124E+00	5.7127E+00	6.417E+00
AM-241 #A	-2.5167E-02	-2.5167E-02	1.1299E+00	1.1299E+00	1.050E+00

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (85.9 to 2000.7 keV) 7.0085840E+00 pCi/gm
Total Decayed Activity (85.9 to 2000.7 keV) 7.0085869E+00 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JPK

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 103F_12SEP2006_1408.An1

Sample description
FSS-OOL-05-10-001-F

Spectrum Filename: C:\GammaVision\Spectra\103F_12SEP2006_1408.An1

Acquisition information
Start time: 12-Sep-2006 14:08:59
Live time: 2000
Real time: 2002
Dead time: 0.09 %
Detector ID: 4

Detector system
Det 103 - DSPE-471

Calibration
Filename: D3_1LSa.Clb
Detector_103 1.0 Liter Sand Geometry

Energy Calibration
Created: 08-Aug-2005 11:09:41
Zero offset: 0.409 keV
Gain: 0.500 keV/channel
Quadratic: 1.092E-08 keV/channel^2

Efficiency Calibration
Created: 08-Aug-2005 11:11:25
Type: Polynomial
Uncertainty: 0.993 %
Coefficients: -0.264059 -5.138468 0.638383
-0.089199 0.005011 -0.000129

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.41keV)
Stop channel: 4000 (2000.67keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 1.8610E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.8610E+03) =
5.3735E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	09-Sep-2006 08:05:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	103_150K_05AUG05.Pbc 08-Aug-2005 12:54:15
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 19 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.1271

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
74.96	131.	18.49	0.99	9.100E-03	74.81	9.600	1.066E+00	PB212
77.23	200.	13.63	0.99	1.015E-02	77.11	17.500	8.089E-01	PB212
					77.11	10.700	1.323E+00	PB214
92.66	147.	27.86	1.72	1.640E-02	92.38	2.570	2.242E+00	TH234
					92.80	3.000	PBC<MDA	TH234
186.42	113.	29.25	1.28	2.565E-02	185.99	3.280	PBC<MDA	RA226
238.79	917.	3.87	1.09	2.319E-02	238.63	43.100	6.570E-01	PB212
242.20	113.	20.44	1.10	2.301E-02	241.00	3.900	9.129E-01	RA224
					241.92	7.470	4.776E-01	PB214
270.61	75.	35.35	0.94	2.149E-02				
295.30	265.	11.12	1.25	2.024E-02	295.22	19.200	4.874E-01	PB214
300.37	65.	30.68	1.57	2.000E-02				
327.62	65.	38.14	0.98	1.876E-02				
338.41	181.	15.29	1.09	1.830E-02	338.40	12.010	5.957E-01	AC228
352.01	357.	7.58	1.08	1.775E-02	351.99	37.100	3.876E-01	PB214
462.64	104.	22.25	1.19	1.427E-02				
462.64	104.	22.25	1.19	1.427E-02	463.51	10.000	5.237E-01	SB125
510.71	167.	15.31	1.30	1.317E-02	510.72	22.500	3.433E-01	TL208
583.36	356.	7.13	1.03	1.184E-02	583.14	86.000	2.507E-01	TL208
609.48	306.	8.36	1.22	1.144E-02	609.32	46.090	4.128E-01	BI214
661.56	43.	36.24	1.57	1.072E-02	661.62	84.620	PBC<MDA	CS137
727.66	66.	24.44	1.52	9.960E-03	727.17	11.800	4.021E-01	BI212
795.27	63.	22.66	0.87	9.306E-03				
795.27	63.	22.66	0.87	9.306E-03	795.76	85.400	5.768E-02	CS134
860.70	45.	31.97	1.46	8.766E-03				
911.31	236.	8.95	1.41	8.400E-03	911.07	29.000	6.933E-01	AC228
964.34	40.	28.32	1.54	8.054E-03	964.00	14.580	PBC<MDA	EU152

969.32	116.	11.61	1.54	8.024E-03	968.90	17.460	5.987E-01	AC228
1120.60	94.	20.90	1.75	7.210E-03	1120.28	15.040	6.146E-01	BI214
1461.17	1114.	3.11	1.98	5.931E-03	1460.75	10.700	1.252E+01	K40
1764.90	71.	11.87	1.71	5.141E-03	1764.51	15.920	6.008E-01	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
540.38	270.61	265.	75.	0.038	106.05	0.937	AC-228	s
599.88	300.37	161.	65.	0.033	92.05	1.568	PB-212	s
654.38	327.62	213.	65.	0.033	114.43	0.981	AC-228	
1720.44	860.70	54.	45.	0.023	95.92	1.459	TL-208	
1927.69	964.24	44.	40.	0.020	84.95	1.538	EU-152	lD

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-212	148.79	74.81	275.	127.	0.064	59.72	0.993D
PB-212	153.39	77.11	275.	142.	0.071	47.01	0.995A
TH-234	185.44	93.13	737.	108.	0.054	94.38	1.500s
TH-234	185.46	93.14	740.	104.	0.052	97.44	1.500s
RA-226	371.66	186.25	595.	113.	0.056	85.82	1.500s
PB-212	476.63	238.74	651.	803.	0.401	18.56	0.986
RA-224	482.65	241.74	636.	106.	0.053	105.29	1.500
PB-214	589.74	295.30	236.	261.	0.130	33.36	1.245s
AC-228	675.97	338.41	219.	180.	0.090	45.86	1.088
PB-214	703.11	351.99	246.	381.	0.191	26.89	1.087
SB-125	925.48	463.18	111.	66.	0.033	75.68	1.500
TL-208	1020.53	510.71	174.	140.	0.070	45.94	1.303s
TL-208	1165.82	583.36	100.	352.	0.176	21.39	1.029
BI-214	1218.06	609.48	112.	300.	0.150	25.08	1.219
CS-137	1322.21	661.56	76.	42.	0.021	108.73	1.565
BI-212	1454.40	727.66	69.	65.	0.033	73.33	1.518
CS-134	1588.93	794.94	32.	45.	0.022	70.05	1.500s
AC-228	1821.65	911.31	63.	233.	0.116	26.85	1.409
AC-228	1936.76	968.87	84.	170.	0.085	39.70	1.310
BI-214	2240.17	1120.60	80.	92.	0.046	62.69	1.749s
K-40	2921.21	1461.17	37.	1095.	0.547	9.33	1.983
BI-214	3528.55	1764.90	3.	68.	0.034	35.60	1.709

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	MDA Value pCi/gm	COMMENTS
BE-7		1.3593E-01					
			477.56	1.359E-01	%(	2.247E-01 6.92E-02	G
K-40		1.2525E+01					
			1460.75	1.252E+01	(P	3.562E-01 3.96E-01	G
MN-54		5.3761E-03					
			834.81	5.376E-03	&(P	3.624E-02 1.05E-02	G
CO-57		-1.8200E-03					
			122.07	-1.820E-03	%(P	4.783E-02 1.42E-02	G K
			136.43	-6.318E-03	%	3.481E-01 1.03E-01	G
CO-60		-4.1813E-03					
			1332.51	-4.181E-03	%(P	3.729E-02 1.01E-02	G K
			1173.23	-5.656E-03	% P	4.118E-02 1.16E-02	G K
Sr-85		-1.7813E-02					
			514.00	-1.781E-02	%(	3.892E-02 1.18E-02	G
Kr-85		-3.9719E+02					
			513.99	-3.972E+02	%(	8.677E+02 2.63E+02	G
Y-88		1.8290E-03					
			1836.01	1.829E-03	%(P	2.043E-02 5.22E-03	G K
			898.02	1.667E-03	% P	2.750E-02 7.65E-03	G
NB-94		4.4224E-04					
			871.10	4.422E-04	%(	2.896E-02 8.12E-03	G K
			702.50	1.040E-02	&	3.252E-02 9.68E-03	G K
Ag-108M		-1.0501E-02					
			722.95	-1.050E-02	%(	3.855E-02 1.14E-02	G K
			614.37	-1.253E-02	% P	3.632E-02 1.08E-02	G
			433.93	-2.838E-03	%	2.824E-02 8.22E-03	G
CD-109		-9.1480E-02					
			88.04	-9.148E-02	&(	1.500E+00 4.46E-01	G
SN-113		-5.2294E-03					
			391.71	-5.229E-03	%(	4.560E-02 1.34E-02	G K
			255.04	1.322E-01	&	1.361E+00 4.03E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	7.8513E-02						
		427.95	-8.546E-03	&(P	9.762E-02	2.85E-02	G K
		600.77	1.828E-03	% P	1.177E-01	3.30E-02	G
		636.15	-3.064E-02	% P	2.293E-01	6.57E-02	G
		463.51	3.362E-01	(P	2.646E-01	8.65E-02	G
		176.29	4.736E-03	%	5.380E-01	1.60E-01	G
I-131	-8.0947E-03						
		364.48	-8.095E-03	%(P	4.572E-02	1.35E-02	G K
		636.97	-4.137E-02	%	4.212E-01	1.20E-01	G
		284.29	-1.173E-01	& P	6.396E-01	1.90E-01	G
CS-134	1.5743E-02						
		604.66	-6.241E-03	%(	3.440E-02	1.01E-02	G K
		795.76	4.087E-02	(P	2.670E-02	9.56E-03	G
		569.29	1.921E-02	% P	1.933E-01	5.59E-02	G
		801.84	-6.785E-02	% P	3.415E-01	9.73E-02	G
CS-137	3.3470E-02						
		661.62	3.347E-02	(P	3.473E-02	1.25E-02	G
CE-139	-1.5592E-03						
		165.85	-1.559E-03	&(	4.350E-02	1.29E-02	G
EU-152	-5.9544E-03						
		121.78	-5.954E-03	%(P	1.355E-01	4.03E-02	G K
		344.30	2.145E-02	% P	9.432E-02	2.80E-02	G
		1408.08	2.529E-02	%	1.224E-01	3.46E-02	G
		964.00	1.357E-01	% P	2.462E-01	7.53E-02	G
		1112.07	5.790E-02	%	2.730E-01	7.95E-02	G
		778.90	9.057E-02	%	1.309E-01	4.18E-02	G
EU-154	-2.1914E-03						
		123.10	-2.191E-03	&(	9.628E-02	2.86E-02	G K
		1274.80	1.237E-04	&	1.130E-01	3.17E-02	G
		723.30	-1.658E-03	%	1.704E-01	4.87E-02	G
		1004.80	-6.598E-02	%	2.237E-01	6.62E-02	G
EU-155	8.6522E-02						
		86.45	8.652E-02	%(	2.118E-01	6.41E-02	G K
		105.31	8.239E-03	%	1.923E-01	5.71E-02	G
HG-203	1.5345E-02						
		279.17	1.535E-02	&(P	3.484E-02	1.05E-02	G K
		72.87	-6.308E-01	% P	2.028E+00	6.11E-01	G
		70.83	6.269E-01	&	3.565E+00	1.07E+00	G
		82.50	-7.354E-02	&	3.660E+00	1.09E+00	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments

TL-208       2.5070E-01
                          583.14 2.507E-01  (P 3.520E-02 1.81E-02 G
                          510.72 3.433E-01 + P 1.572E-01 6.26E-02 G

PB-212       5.8305E-01
                          238.63 5.831E-01  (P 8.833E-02 3.66E-02 G K
                                                          Energy duplication
                           77.11 5.831E-01 } P 3.281E-01 9.14E-02 G
                           74.81 1.064E+00 + P 6.681E-01 2.17E-01 G

PB-214       4.4328E-01
                          351.99 4.204E-01  (P 8.351E-02 3.82E-02 G K
                          295.22 4.874E-01 @(P 1.388E-01 5.51E-02 G
                                                          Energy duplication
                           77.11 1.725E-01 } P 8.164E-01 1.96E-01 G
                          241.92 5.739E-02 %   5.218E-01 1.56E-01 G

BI-212       4.0206E-01
                          727.17 4.021E-01  (P 2.556E-01 9.91E-02 G K
                         1620.56 2.144E-01 % P 6.788E-01 1.95E-01 G
                          785.42 4.126E-01 %   1.512E+00 4.45E-01 G

BI-214       4.1280E-01
                          609.32 4.128E-01  (P 7.174E-02 3.53E-02 G K
                         1764.51 6.008E-01 + P 9.882E-02 7.48E-02 G
                         1120.28 6.146E-01 + P 2.975E-01 1.31E-01 G

RA-224       8.5364E-01
                          241.00 8.536E-01 &(  9.704E-01 3.00E-01 G

RA-226       9.7083E-01
                          185.99 9.708E-01  (P 1.004E+00 3.10E-01 G

AC-228       6.6474E-01
                          911.07 6.933E-01  (P 1.186E-01 6.30E-02 G K
                          968.90 8.802E-01 + P 2.356E-01 1.17E-01 G
                          338.40 5.957E-01  (P 2.366E-01 9.16E-02 G

TH-227       0.0000E+00
                          236.00 0.000E+00 %(  4.107E-01 1.22E-01 G K
                          256.25-9.226E-02 % P 4.367E-01 1.30E-01 G

PA-234      -4.1589E-02
                           98.44-4.159E-02 &(P 1.910E-01 5.72E-02 G K
                          946.00 5.807E-02 % P 1.513E-01 4.52E-02 G
                          131.28 2.252E-02 % P 1.938E-01 5.79E-02 G
                           94.67-9.005E-02 % P 3.688E-01 1.11E-01 G
                          883.24 8.330E-03 &   2.265E-01 6.34E-02 G
                          926.70 4.508E-02 %   2.972E-01 8.58E-02 G
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 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26 2.829E-02 % P 2.860E-01 8.27E-02 G

TH-234       9.0216E-01
                           63.29-2.228E-01 %(P 5.743E+00 1.69E+00 G K
                           92.80 1.533E+00  (P 1.905E+00 5.82E-01 G
                           92.38 1.873E+00  (P 2.239E+00 6.85E-01 G

AM-241       1.1196E-01
                           59.54 1.120E-01 %(P 9.745E-01 2.90E-01 G
   ( - This peak used in the nuclide activity average.

   * - Peak is too wide, but only one peak in library.
   ! - Peak is part of a multiplet and this area went
       negative during deconvolution.
   ? - Peak is too narrow.
   @ - Peak is too wide at FW25M, but ok at FWHM.
   % - Peak fails sensitivity test.
   $ - Peak identified, but first peak of this nuclide
       failed one or more qualification tests.
   + - Peak activity higher than counting uncertainty range.
   - - Peak activity lower than counting uncertainty range.
   = - Peak outside analysis energy range.
   & - Calculated peak centroid is not close enough to the
       library energy centroid for positive identification.
   P - Peakbackground subtraction
   } - Peak is too close to another for the activity
       to be found directly.

   Nuclide Codes:                      Peak Codes:
   T - Thermal Neutron Activation      G - Gamma Ray
   F - Fast Neutron Activation         X - X-Ray
   I - Fission Product                 P - Positron Decay
   N - Naturally Occurring Isotope     S - Single-Escape
   P - Photon Reaction                 D - Double-Escape
   C - Charged Particle Reaction       K - Key Line
   M - No MDA Calculation              A - Not in Average
   R - Coincidence Corrected           C - Coincidence Peak
   H - Halflife limit exceeded

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
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***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	1.3031E-01	1.3593E-01	2.0769E-01	2.0784E-01	2.154E-01
K-40		1.2525E+01	1.2525E+01	1.1891E+00	1.3938E+00	
MN-54	#A	5.3375E-03	5.3761E-03	3.1580E-02	3.1582E-02	3.598E-02
CO-57	#B	-1.8048E-03	-1.8200E-03	5.0772E-02	5.0772E-02	4.743E-02
CO-60	#B	-4.1764E-03	-4.1813E-03	1.9000E-01	1.9000E-01	3.725E-02

Sr-85	#A	-1.7204E-02	-1.7813E-02	3.5340E-02	3.5355E-02	3.759E-02
Kr-85	#A	-3.9718E+02	-3.9719E+02	7.8799E+02	7.8833E+02	8.677E+02
Y-88	#B	1.7908E-03	1.8290E-03	1.5667E-02	1.5667E-02	2.000E-02
NB-94	#B	4.4224E-04	4.4224E-04	2.4372E-02	2.4372E-02	2.896E-02
Ag-108M	#B	-1.0501E-02	-1.0501E-02	3.4240E-02	3.4246E-02	3.854E-02
CD-109	#A	-9.1026E-02	-9.1480E-02	1.3372E+00	1.3372E+00	1.492E+00
SN-113	#B	-5.1280E-03	-5.2294E-03	4.0189E-02	4.0190E-02	4.472E-02
SB-125	#B	7.8338E-02	7.8513E-02	6.0572E-02	6.0744E-02	9.741E-02
I-131	#B	-6.1152E-03	-8.0947E-03	4.5418E-02	4.5421E-02	3.454E-02
CS-134	#B	1.5696E-02	1.5743E-02	1.1049E-02	1.1087E-02	3.429E-02
CS-137	A	3.3463E-02	3.3470E-02	3.7601E-02	3.7651E-02	
CE-139	#A	-1.5339E-03	-1.5592E-03	3.8795E-02	3.8795E-02	4.279E-02
EU-152	#B	-5.9516E-03	-5.9544E-03	1.7043E-01	1.7044E-01	1.354E-01
EU-154	#B	-2.1899E-03	-2.1914E-03	8.5869E-02	8.5869E-02	9.621E-02
EU-155	#B	8.6414E-02	8.6522E-02	1.9219E-01	1.9225E-01	2.116E-01
HG-203	#B	1.4620E-02	1.5345E-02	3.1605E-02	3.1618E-02	3.319E-02
TL-208		2.5070E-01	2.5070E-01	5.4270E-02	5.6188E-02	
PB-212		5.8305E-01	5.8305E-01	1.0982E-01	1.1492E-01	
PB-214		4.4328E-01	4.4328E-01	9.6407E-02	9.9783E-02	
BI-212		4.0206E-01	4.0206E-01	2.9707E-01	2.9799E-01	
BI-214		4.1280E-01	4.1280E-01	1.0577E-01	1.0845E-01	
RA-224	#A	8.5364E-01	8.5364E-01	8.9876E-01	9.0013E-01	9.704E-01
RA-226	#A	9.7082E-01	9.7083E-01	9.2906E-01	9.3077E-01	1.004E+00
AC-228		6.6474E-01	6.6474E-01	1.7807E-01	1.8221E-01	
TH-227	#B	0.0000E+00	0.0000E+00	3.6708E-01	3.6708E-01	4.107E-01
PA-234	#B	-4.1589E-02	-4.1589E-02	1.8501E-01	1.8503E-01	1.910E-01
TH-234	#B	9.0216E-01	9.0216E-01	9.9045E-01	9.9172E-01	5.743E+00
AM-241	#A	1.1196E-01	1.1196E-01	8.7034E-01	8.7036E-01	9.745E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (86.4 to 2000.7 keV) 1.5314692E+01 pCi/gm
Total Decayed Activity (86.4 to 2000.7 keV) 1.5314698E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JJM

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 103F_12SEP2006_1446.An1

Sample description
FSS-OOL-05-10-012-F

Spectrum Filename: C:\GammaVision\Spectra\103F_12SEP2006_1446.An1

Acquisition information
Start time: 12-Sep-2006 14:46:39
Live time: 2000
Real time: 2002
Dead time: 0.08 %
Detector ID: 4

Detector system
Det 103 - DSPE-471

Calibration
Filename: D3_1LSa.Clb
Detector_103 1.0 Liter Sand Geometry

Energy Calibration
Created: 08-Aug-2005 11:09:41
Zero offset: 0.409 keV
Gain: 0.500 keV/channel
Quadratic: 1.092E-08 keV/channel^2

Efficiency Calibration
Created: 08-Aug-2005 11:11:25
Type: Polynomial
Uncertainty: 0.993 %
Coefficients: -0.264059 -5.138468 0.638383
-0.089199 0.005011 -0.000129

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.41keV)
Stop channel: 4000 (2000.67keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 1.9240E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.9240E+03) =
5.1975E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	09-Sep-2006 11:03:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	103_150K_05AUG05.Pbc 08-Aug-2005 12:54:15
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 17 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.2016

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
74.96	113.	20.70	0.99	9.052E-03	74.81	9.600	9.120E-01	PB212
77.26	119.	18.00	0.99	1.011E-02	77.11	17.500	4.915E-01	PB212
186.35	144.	22.20	1.65	2.566E-02	185.99	3.280	1.095E+00	RA226
238.77	725.	4.34	1.09	2.319E-02	238.63	43.100	5.010E-01	PB212
242.06	150.	15.55	1.10	2.302E-02	241.00	3.900	1.171E+00	RA224
					241.92	7.470	6.126E-01	PB214
270.33	78.	30.22	1.30	2.151E-02				
276.84	50.	39.10	0.84	2.117E-02				
295.39	224.	9.49	1.13	2.024E-02	295.22	19.200	3.967E-01	PB214
300.01	44.	36.99	1.13	2.002E-02				
338.51	181.	17.55	0.88	1.830E-02	338.40	12.010	5.736E-01	AC228
351.98	412.	6.52	1.18	1.775E-02	351.99	37.100	4.339E-01	PB214
511.06	99.	20.33	1.29	1.317E-02	510.72	22.500	1.714E-01	TL208
583.11	232.	8.41	1.38	1.185E-02	583.14	86.000	1.573E-01	TL208
609.47	319.	7.09	1.20	1.144E-02	609.32	46.090	4.158E-01	BI214
727.84	60.	23.60	1.36	9.958E-03	727.17	11.800	3.572E-01	BI212
795.36	32.	31.84	1.50	9.301E-03	795.76	85.400	2.855E-02	CS134
911.42	190.	9.79	1.27	8.399E-03	911.07	29.000	5.369E-01	AC228
934.74	30.	35.59	1.06	8.242E-03				
964.61	28.	27.45	1.54	8.052E-03				
969.29	109.	10.75	1.54	8.024E-03	968.90	17.460	5.452E-01	AC228
1120.50	108.	16.97	2.12	7.211E-03	1120.28	15.040	6.871E-01	BI214
1461.30	674.	4.01	1.94	5.930E-03	1460.75	10.700	7.249E+00	K40
1764.98	56.	14.44	1.29	5.141E-03	1764.51	15.920	4.481E-01	BI214

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

Peak Centroid Channel	Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide
539.82	270.33	205.	78.	0.039	90.67	1.296	AC-228

Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM	Suspected	
552.84	276.84	142.	62.	0.031	89.35	0.836	TL-208	
599.16	299.99	111.	44.	0.022	110.97	1.131	TH-227	lD
1868.49	934.74	28.	30.	0.015	106.77	1.063	BI-214	
1928.90	964.58	15.	28.	0.014	81.99	1.538	AC-228	D

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-212	148.79	74.81	233.	113.	0.056	62.11	0.993D
PB-212	153.39	77.11	281.	119.	0.060	54.00	0.995A
RA-226	371.86	186.35	380.	131.	0.066	66.59	1.648s
PB-212	476.87	238.86	541.	708.	0.354	19.30	1.110
RA-224	482.65	241.75	482.	143.	0.071	69.91	1.500
PB-214	482.61	241.73	566.	98.	0.049	107.18	1.500
PB-214	589.88	295.37	175.	202.	0.101	34.52	0.924
AC-228	676.16	338.51	243.	180.	0.090	52.65	0.881
PB-214	703.09	351.98	130.	407.	0.203	19.57	1.177
TL-208	1021.23	511.06	129.	72.	0.036	60.98	1.289
TL-208	1165.33	583.11	62.	228.	0.114	25.24	1.382s
BI-214	1218.03	609.47	75.	312.	0.156	21.27	1.198
BI-212	1454.76	727.84	53.	60.	0.030	70.81	1.362
CS-134	1589.78	795.36	37.	32.	0.016	95.53	1.500s
AC-228	1821.87	911.42	52.	186.	0.093	29.37	1.266
AC-228	1936.81	968.90	13.	109.	0.054	32.01	1.541D
BI-214	2239.97	1120.50	59.	106.	0.053	50.92	2.118s
K-40	2921.47	1461.30	32.	655.	0.328	12.03	1.940
BI-214	3528.71	1764.98	6.	52.	0.026	43.33	1.293s

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	MDA Value pCi/gm	COMMENTS
BE-7		8.3094E-02					
			477.56	8.309E-02	%(	1.683E-01 5.12E-02	G
K-40		7.2489E+00					
			1460.75	7.249E+00	(P	3.213E-01 2.99E-01	G
MN-54		1.4757E-02					
			834.81	1.476E-02	%(P	2.958E-02 8.99E-03	G
CO-57		-3.1764E-03					
			122.07	-3.176E-03	%(P	3.980E-02 1.18E-02	G K
			136.43	7.855E-02	&	3.240E-01 9.72E-02	G
CO-60		-1.2889E-02					
			1332.51	-1.289E-02	%(P	3.463E-02 9.83E-03	G K
			1173.23	-1.016E-02	& P	3.909E-02 1.12E-02	G K
Sr-85		-6.3197E-03					
			514.00	-6.320E-03	%(	3.287E-02 9.70E-03	G
Kr-85		-1.4145E+02					
			513.99	-1.415E+02	%(	7.338E+02 2.17E+02	G
Y-88		-4.4361E-03					
			1836.01	-4.436E-03	%(P	2.849E-02 7.85E-03	G K
			898.02	7.933E-03	% P	2.654E-02 7.76E-03	G
NB-94		2.8418E-03					
			871.10	2.842E-03	&(	2.103E-02 5.91E-03	G K
			702.50	1.050E-02	%	2.349E-02 7.09E-03	G K
Ag-108M		4.0884E-03					
			722.95	4.088E-03	&(	2.375E-02 6.81E-03	G K
			614.37	-4.515E-03	& P	2.999E-02 8.71E-03	G
			433.93	6.453E-03	&	2.654E-02 7.84E-03	G
CD-109		4.8261E-01					
			88.04	4.826E-01	%(	1.530E+00 4.61E-01	G
SN-113		4.0968E-03					
			391.71	4.097E-03	&(	3.815E-02 1.11E-02	G K
			255.04	-4.845E-03	&	1.350E+00 3.97E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	-2.2436E-02						
		427.95	-2.244E-02	%(P	8.658E-02	2.57E-02	G K
		600.77	3.279E-02	% P	1.335E-01	3.92E-02	G
		636.15	1.715E-02	& P	2.439E-01	6.99E-02	G
		463.51	1.131E-01	% P	2.635E-01	7.93E-02	G
		176.29	-9.603E-02	%	4.467E-01	1.34E-01	G
I-131	-2.7541E-03						
		364.48	-2.754E-03	&(P	3.729E-02	1.08E-02	G K
		636.97	1.222E-02	&	4.751E-01	1.35E-01	G
		284.29	-1.085E-01	% P	5.137E-01	1.52E-01	G
CS-134	9.9881E-03						
		604.66	-6.255E-03	%(	3.191E-02	9.38E-03	G K
		795.76	2.855E-02	(P	2.747E-02	9.12E-03	G
		569.29	2.111E-02	& P	1.557E-01	4.48E-02	G
		801.84	8.179E-02	% P	2.704E-01	7.87E-02	G
CS-137	-1.0746E-03						
		661.62	-1.075E-03	%(P	3.659E-02	1.04E-02	G
CE-139	-5.4834E-03						
		165.85	-5.483E-03	&(	3.486E-02	1.04E-02	G
EU-152	-9.9189E-03						
		121.78	-9.919E-03	%(P	1.193E-01	3.55E-02	G K
		344.30	1.386E-03	& P	9.386E-02	2.73E-02	G
		1408.08	4.185E-02	%	1.203E-01	3.54E-02	G
		964.00	3.257E-03	% P	1.378E-01	3.69E-02	G
		1112.07	1.657E-03	&	2.162E-01	5.98E-02	G
		778.90	1.152E-02	%	1.671E-01	4.67E-02	G
EU-154	-1.0173E-02						
		123.10	-1.017E-02	&(	8.945E-02	2.67E-02	G K
		1274.80	1.264E-02	%	8.789E-02	2.50E-02	G
		723.30	-3.796E-03	&	2.617E-01	7.66E-02	G
		1004.80	-7.108E-03	&	1.189E-01	3.24E-02	G
EU-155	5.8542E-02						
		86.45	5.854E-02	%(	1.922E-01	5.79E-02	G K
		105.31	3.623E-02	%	1.926E-01	5.76E-02	G
HG-203	-6.4442E-03						
		279.17	-6.444E-03	%(P	3.314E-02	9.85E-03	G K
		72.87	-3.121E-01	% P	1.762E+00	5.27E-01	G
		70.83	-1.752E+00	%	3.348E+00	1.02E+00	G
		82.50	-1.111E+00	%	3.379E+00	1.02E+00	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	1.6020E-01						
		583.14	1.573E-01	@(P	2.715E-02	1.35E-02	G
		510.72	1.714E-01	(P	1.317E-01	4.77E-02	G
PB-212	4.9583E-01						
		238.63	4.976E-01	(P	7.802E-02	3.26E-02	G K
							Energy duplication
		77.11	4.732E-01	} P	3.208E-01	8.52E-02	G
		74.81	9.120E-01	+ P	5.970E-01	1.94E-01	G
PB-214	4.2836E-01						
		351.99	4.339E-01	(P	5.958E-02	2.87E-02	G K
		295.22	3.657E-01	- P	1.161E-01	4.29E-02	G
							Energy duplication
		77.11	1.966E-02	} P	6.318E-01	1.06E-01	G
		241.92	4.010E-01	(	4.639E-01	1.43E-01	G
BI-212	3.5724E-01						
		727.17	3.572E-01	(P	2.192E-01	8.51E-02	G K
		1620.56	1.404E-01	% P	8.772E-01	2.42E-01	G
		785.42	6.185E-01	%	1.302E+00	3.95E-01	G
BI-214	4.2411E-01						
		609.32	4.158E-01	(P	5.733E-02	3.01E-02	G K
		1764.51	4.481E-01	(P	1.193E-01	6.88E-02	G
		1120.28	6.871E-01	+ P	2.491E-01	1.19E-01	G
RA-224	1.1143E+00						
		241.00	1.114E+00	(	8.197E-01	2.60E-01	G
RA-226	1.0950E+00						
		185.99	1.095E+00	*(P	7.802E-01	2.67E-01	G
AC-228	5.4692E-01						
		911.07	5.369E-01	(P	1.045E-01	5.35E-02	G K
		968.90	5.452E-01	(P	9.851E-02	5.83E-02	G
		338.40	5.736E-01	(P	2.410E-01	1.01E-01	G
TH-227	-1.0053E-01						
		236.00	-1.005E-01	%(	2.818E-01	8.49E-02	G K
		256.25	8.029E-02	% P	3.947E-01	1.18E-01	G
PA-234	-1.7485E-02						
		98.44	-1.749E-02	%(P	1.797E-01	5.35E-02	G K
		946.00	8.519E-03	& P	1.150E-01	3.19E-02	G
		131.28	4.682E-02	% P	1.552E-01	4.66E-02	G
		94.67	-5.601E-02	& P	3.357E-01	1.00E-01	G
		883.24	3.315E-02	%	1.871E-01	5.33E-02	G
		926.70	-2.559E-02	%	2.543E-01	7.22E-02	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26 3.164E-02 & P 2.302E-01 6.62E-02 G

TH-234       5.0529E-01
                           63.29 5.053E-01 &(P 4.765E+00 1.41E+00 G K
                           92.80 6.216E-01 % P 1.763E+00 5.28E-01 G
                           92.38 7.114E-01 % P 2.093E+00 6.27E-01 G

AM-241       7.9446E-02
                           59.54 7.945E-02 &(P 7.745E-01 2.29E-01 G
   ( - This peak used in the nuclide activity average.

   * - Peak is too wide, but only one peak in library.
   ! - Peak is part of a multiplet and this area went
       negative during deconvolution.
   ? - Peak is too narrow.
   @ - Peak is too wide at FW25M, but ok at FWHM.
   % - Peak fails sensitivity test.
   $ - Peak identified, but first peak of this nuclide
       failed one or more qualification tests.
   + - Peak activity higher than counting uncertainty range.
   - - Peak activity lower than counting uncertainty range.
   = - Peak outside analysis energy range.
   & - Calculated peak centroid is not close enough to the
       library energy centroid for positive identification.
   P - Peakbackground subtraction
   } - Peak is too close to another for the activity
       to be found directly.

   Nuclide Codes:                      Peak Codes:
   T - Thermal Neutron Activation      G - Gamma Ray
   F - Fast Neutron Activation         X - X-Ray
   I - Fission Product                 P - Positron Decay
   N - Naturally Occurring Isotope     S - Single-Escape
   P - Photon Reaction                 D - Double-Escape
   C - Charged Particle Reaction       K - Key Line
   M - No MDA Calculation              A - Not in Average
   R - Coincidence Corrected           C - Coincidence Peak
   H - Halflife limit exceeded

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
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***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	7.9759E-02	8.3094E-02	1.5363E-01	1.5371E-01	1.616E-01
K-40		7.2489E+00	7.2489E+00	8.9728E-01	9.9107E-01	
MN-54	#A	1.4654E-02	1.4757E-02	2.6961E-02	2.6975E-02	2.937E-02
CO-57	#B	-3.1507E-03	-3.1764E-03	3.9060E-02	3.9061E-02	3.948E-02
CO-60	#B	-1.2874E-02	-1.2889E-02	4.6869E-02	4.6875E-02	3.459E-02

Sr-85	#A	-6.1100E-03	-6.3197E-03	2.9101E-02	2.9103E-02	3.178E-02
Kr-85	#A	-1.4145E+02	-1.4145E+02	6.4964E+02	6.4969E+02	7.338E+02
Y-88	#B	-4.3460E-03	-4.4361E-03	2.4539E-02	2.4541E-02	2.791E-02
NB-94	#B	2.8418E-03	2.8418E-03	1.7744E-02	1.7745E-02	2.103E-02
Ag-108M	#B	4.0882E-03	4.0884E-03	2.0421E-02	2.0422E-02	2.375E-02
CD-109	#A	4.8029E-01	4.8261E-01	1.3820E+00	1.3822E+00	1.523E+00
SN-113	#B	4.0197E-03	4.0968E-03	3.3427E-02	3.3428E-02	3.743E-02
SB-125	#B	-2.2388E-02	-2.2436E-02	7.7427E-02	7.7438E-02	8.639E-02
I-131	#B	-2.0982E-03	-2.7541E-03	4.5116E-02	4.5116E-02	2.841E-02
CS-134	#B	9.9591E-03	9.9881E-03	9.5673E-03	9.5848E-03	3.182E-02
CS-137	#A	-1.0744E-03	-1.0746E-03	8.6504E-02	8.6504E-02	3.658E-02
CE-139	#A	-5.3969E-03	-5.4834E-03	3.1166E-02	3.1167E-02	3.431E-02
EU-152	#B	-9.9143E-03	-9.9189E-03	1.2972E-01	1.2972E-01	1.192E-01
EU-154	#B	-1.0166E-02	-1.0173E-02	8.0047E-02	8.0049E-02	8.939E-02
EU-155	#B	5.8471E-02	5.8542E-02	1.7359E-01	1.7362E-01	1.920E-01
HG-203	#B	-6.1486E-03	-6.4442E-03	2.9688E-02	2.9690E-02	3.162E-02
TL-208		1.6020E-01	1.6020E-01	4.1191E-02	4.2228E-02	
PB-212		4.9583E-01	4.9583E-01	9.7322E-02	1.0149E-01	
PB-214		4.2836E-01	4.2836E-01	8.4973E-02	8.8538E-02	
BI-212		3.5724E-01	3.5724E-01	2.5506E-01	2.5590E-01	
BI-214		4.2411E-01	4.2411E-01	9.2066E-02	9.5302E-02	
RA-224	#	1.1143E+00	1.1143E+00	7.7899E-01	7.8167E-01	8.197E-01
RA-226	#	1.0950E+00	1.0950E+00	8.0114E-01	8.0365E-01	
AC-228		5.4692E-01	5.4692E-01	1.2535E-01	1.2931E-01	
TH-227	#B	-1.0053E-01	-1.0053E-01	2.5473E-01	2.5479E-01	2.818E-01
PA-234	#B	-1.7485E-02	-1.7485E-02	1.9082E-01	1.9082E-01	1.797E-01
TH-234	#B	5.0529E-01	5.0529E-01	4.2325E+00	4.2326E+00	4.765E+00
AM-241	#A	7.9445E-02	7.9446E-02	6.8832E-01	6.8833E-01	7.745E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (1120.0 to 2000.7 keV) 1.0756537E+01 pCi/gm
Total Decayed Activity (1120.0 to 2000.7 keV) 1.0756541E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JJM

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 103F_12SEPT2006_1042.An1

Sample description
FSS-OOL-05-10-016-F

Spectrum Filename: C:\GammaVision\Spectra\103F_12SEPT2006_1042.An1

Acquisition information
Start time: 12-Sep-2006 10:42:44
Live time: 2000
Real time: 2001
Dead time: 0.07 %
Detector ID: 4

Detector system
Det 103 - DSPE-471

Calibration
Filename: D3_1LSa.Clb
Detector_103 1.0 Liter Sand Geometry

Energy Calibration
Created: 08-Aug-2005 11:09:41
Zero offset: 0.409 keV
Gain: 0.500 keV/channel
Quadratic: 1.092E-08 keV/channel^2

Efficiency Calibration
Created: 08-Aug-2005 11:11:25
Type: Polynomial
Uncertainty: 0.993 %
Coefficients: -0.264059 -5.138468 0.638383
-0.089199 0.005011 -0.000129

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.41keV)
Stop channel: 4000 (2000.67keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 1.6650E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.6650E+03) =
6.0060E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	09-Sep-2006 13:40:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	103_150K_05AUG05.Pbc 08-Aug-2005 12:54:15
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 13 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.1367

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
75.05	82.	26.40	0.99	9.193E-03	74.81	9.600	7.350E-01	PB212
77.22	137.	16.77	0.99	1.019E-02	77.11	10.700	1.004E+00	PB214
					77.11	17.500	6.139E-01	PB212
93.69	66.	41.62	1.46	1.676E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
185.45	121.	27.02	1.00	2.568E-02				
185.45	121.	27.02	1.00	2.568E-02	185.99	3.280	1.040E+00	RA226
209.96	77.	33.76	0.72	2.468E-02				
238.73	595.	4.76	1.09	2.320E-02	238.63	43.100	4.730E-01	PB212
241.72	104.	18.73	1.09	2.304E-02	241.00	3.900	9.344E-01	RA224
					241.92	7.470	4.889E-01	PB214
269.68	74.	33.77	1.14	2.154E-02				
295.25	154.	14.73	1.07	2.025E-02	295.22	19.200	3.141E-01	PB214
338.76	150.	14.74	1.34	1.829E-02	338.40	12.010	5.506E-01	AC228
351.98	292.	9.19	1.07	1.775E-02	351.99	37.100	3.534E-01	PB214
510.87	134.	13.96	1.92	1.317E-02	510.72	22.500	2.939E-01	TL208
583.32	195.	10.58	1.20	1.184E-02	583.14	86.000	1.521E-01	TL208
609.41	188.	9.23	1.46	1.144E-02	609.32	46.090	2.801E-01	BI214
661.19	60.	28.53	0.99	1.073E-02				
661.19	60.	28.53	0.99	1.073E-02	661.62	84.620	5.280E-02	CS137
727.09	41.	32.35	1.50	9.965E-03	727.17	11.800	PBC<MDA	BI212
795.00	22.	41.65	1.50	9.301E-03	795.76	85.400	PBC<MDA	CS134
911.19	177.	11.55	1.41	8.400E-03	911.07	29.000	5.788E-01	AC228
968.32	112.	15.81	1.57	8.029E-03	968.90	17.460	6.502E-01	AC228
1121.53	79.	18.29	1.48	7.212E-03	1120.28	15.040	5.889E-01	BI214
1461.08	852.	3.44	1.89	5.931E-03	1460.75	10.700	1.065E+01	K40
1764.69	33.	18.14	2.23	5.142E-03	1764.51	15.920	3.235E-01	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
419.08	209.96	257.	77.	0.038	101.27	0.725	NP-239	s
538.52	269.68	206.	74.	0.037	101.32	1.140	AC-228	s
1321.46	661.19	88.	42.	0.021	104.67	0.988	CS-137	

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-212	148.79	74.81	191.	81.	0.041	76.12	0.993D
PB-212	153.39	77.11	198.	101.	0.051	55.51	0.995A
TH-234	185.62	93.22	528.	81.	0.040	101.75	1.500s
RA-226	371.31	186.07	425.	89.	0.044	89.70	1.500s
PB-212	476.42	238.63	144.	573.	0.287	14.93	1.093D
PB-214	483.00	241.92	188.	72.	0.036	62.05	1.095A
PB-214	589.65	295.25	150.	150.	0.075	44.20	1.072
AC-228	676.67	338.76	127.	149.	0.075	44.21	1.344s
PB-214	703.09	351.98	144.	287.	0.143	27.57	1.069
TL-208	1020.85	510.87	99.	107.	0.054	41.88	1.917s
TL-208	1165.73	583.32	84.	191.	0.095	31.74	1.197
BI-214	1217.91	609.41	54.	182.	0.091	27.70	1.461s
BI-212	1453.25	727.09	69.	41.	0.020	97.05	1.500s
AC-228	1821.42	911.19	62.	174.	0.087	34.66	1.415
AC-228	1935.65	968.32	50.	112.	0.056	47.43	1.573
BI-214	2242.04	1121.53	43.	79.	0.039	54.86	1.480s
K-40	2921.03	1461.08	21.	833.	0.417	10.32	1.889
BI-214	3528.14	1764.69	5.	33.	0.016	54.42	2.229

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	MDA Value pCi/gm	COMMENTS
BE-7		9.5831E-02					
			477.56	9.583E-02	%(	2.523E-01	7.56E-02 G
K-40		1.0653E+01					
			1460.75	1.065E+01	(P	3.072E-01	3.75E-01 G
MN-54		-3.8365E-04					
			834.81	-3.837E-04	%(P	2.735E-02	7.52E-03 G
CO-57		9.2907E-03					
			122.07	9.291E-03	&(P	4.322E-02	1.29E-02 G K
			136.43	7.498E-02	&	3.215E-01	9.62E-02 G
CO-60		-8.1384E-03					
			1332.51	-8.138E-03	%(P	3.487E-02	9.39E-03 G K
			1173.23	4.132E-03	% P	2.339E-02	6.31E-03 G K
Sr-85		-9.6236E-03					
			514.00	-9.624E-03	%(	3.632E-02	1.08E-02 G
Kr-85		-2.1571E+02					
			513.99	-2.157E+02	%(	8.131E+02	2.41E+02 G
Y-88		-1.0513E-04					
			1836.01	-1.051E-04	%(P	1.230E-02	1.67E-03 G K
			898.02	-9.845E-03	% P	3.690E-02	1.07E-02 G
NB-94		9.4966E-03					
			871.10	9.497E-03	%(	2.758E-02	8.16E-03 G K
			702.50	8.442E-04	&	3.127E-02	8.87E-03 G K
Ag-108M		-1.5174E-02					
			722.95	-1.517E-02	%(	4.750E-02	1.42E-02 G K
			614.37	-2.460E-03	% P	2.948E-02	8.40E-03 G
			433.93	2.494E-03	%	2.078E-02	5.94E-03 G
CD-109		7.7762E-02					
			88.04	7.776E-02	%(	1.676E+00	4.98E-01 G
SN-113		1.6337E-02					
			391.71	1.634E-02	&(	3.491E-02	1.06E-02 G K
			255.04	-4.013E-01	%	1.350E+00	4.04E-01 G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	1.9249E-02						
		427.95	1.925E-02	&(P	6.872E-02	2.02E-02	G K
		600.77	-2.694E-02	& P	1.586E-01	4.61E-02	G
		636.15	-5.126E-03	% P	2.197E-01	6.09E-02	G
		463.51	1.719E-01	% P	2.438E-01	7.58E-02	G
		176.29	0.000E+00	%	4.871E-01	1.44E-01	G
I-131	1.0006E-02						
		364.48	1.001E-02	&(P	3.214E-02	9.52E-03	G K
		636.97	1.080E-03	&	4.505E-01	1.26E-01	G
		284.29	6.178E-02	& P	5.693E-01	1.67E-01	G
CS-134	3.0720E-03						
		604.66	3.072E-03	%(	3.126E-02	9.02E-03	G K
		795.76	2.227E-02	% P	2.914E-02	9.31E-03	G
		569.29	-4.153E-03	% P	1.815E-01	5.10E-02	G
		801.84	-2.226E-02	% P	3.233E-01	8.83E-02	G
CS-137	1.4960E-02						
		661.62	1.496E-02	%(P	3.590E-02	1.07E-02	G
CE-139	2.1703E-03						
		165.85	2.170E-03	%(	3.962E-02	1.17E-02	G
EU-152	2.6074E-02						
		121.78	2.607E-02	&(P	1.260E-01	3.77E-02	G K
		344.30	-4.450E-02	% P	9.855E-02	2.98E-02	G
		1408.08	3.998E-03	&	1.485E-01	4.02E-02	G
		964.00	-3.767E-03	% P	3.697E-01	1.06E-01	G
		1112.07	2.154E-03	%	2.528E-01	7.01E-02	G
		778.90	-8.163E-02	%	2.755E-01	8.16E-02	G
EU-154	-8.4160E-03						
		123.10	-8.416E-03	&(	9.276E-02	2.76E-02	G K
		1274.80	7.463E-03	&	9.884E-02	2.76E-02	G
		723.30	-6.761E-02	%	2.263E-01	6.74E-02	G
		1004.80	-2.519E-02	%	2.138E-01	6.13E-02	G
EU-155	8.1722E-03						
		86.45	8.172E-03	%(	1.971E-01	5.85E-02	G K
		105.31	6.634E-02	%	1.869E-01	5.63E-02	G
HG-203	3.9011E-03						
		279.17	3.901E-03	&(P	3.530E-02	1.04E-02	G K
		72.87	-2.903E-02	% P	2.146E+00	6.38E-01	G
		70.83	-1.517E+00	&	3.623E+00	1.10E+00	G
		82.50	-9.161E-02	&	3.060E+00	9.05E-01	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments

TL-208       1.5210E-01
                          583.14 1.521E-01  (P 3.621E-02 1.65E-02 G
                          510.72 2.939E-01 + P 1.342E-01 5.12E-02 G

PB-212       4.6530E-01
                          238.63 4.653E-01  (P 4.752E-02 2.36E-02 G K
                                                          Energy duplication
                           77.11 4.653E-01 } P 3.128E-01 8.61E-02 G
                           74.81 7.602E-01 + P 6.262E-01 2.00E-01 G

PB-214       3.3997E-01
                          351.99 3.534E-01  (P 7.231E-02 3.31E-02 G K
                          295.22 3.141E-01  (P 1.246E-01 4.75E-02 G
                                                          Energy duplication
                           77.11 1.007E-01 } P 7.196E-01 2.04E-01 G
                          241.92 3.400E-01 }   3.147E-01 7.03E-02 G

BI-212       2.8079E-01
                          727.17 2.808E-01  (P 2.851E-01 9.19E-02 G K
                         1620.56 1.080E-01 & P 1.099E+00 2.99E-01 G
                          785.42-8.809E-02 &   1.437E+00 4.05E-01 G

BI-214       2.9121E-01
                          609.32 2.801E-01 @(P 5.692E-02 2.68E-02 G K
                         1764.51 3.235E-01  (P 1.340E-01 6.46E-02 G
                         1120.28 5.889E-01 + P 2.497E-01 1.10E-01 G

RA-224       6.3803E-01
                                                          Derived Ave Activity
                          241.00 6.380E-01 }(  9.495E-01 3.00E-01 G

RA-226       8.5596E-01
                          185.99 8.560E-01 *(P 9.520E-01 2.93E-01 G

AC-228       5.9429E-01
                          911.07 5.788E-01  (P 1.315E-01 6.82E-02 G K
                          968.90 6.502E-01  (P 2.061E-01 1.03E-01 G
                          338.40 5.506E-01 @(P 2.038E-01 8.18E-02 G

TH-227      -3.3050E-03
                          236.00-3.305E-03 %(  3.505E-01 1.04E-01 G K
                          256.25 7.252E-02 % P 4.015E-01 1.19E-01 G

PA-234       2.5448E-02
                           98.44 2.545E-02 %(P 1.921E-01 5.72E-02 G K
                          946.00-2.470E-02 % P 1.604E-01 4.59E-02 G
                          131.28 1.588E-02 & P 1.756E-01 5.22E-02 G
                           94.67 1.070E-02 % P 2.768E-01 8.17E-02 G
                          883.24 0.000E+00 %   2.930E-01 8.25E-02 G
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 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          926.70-1.367E-03 %   2.301E-01 6.26E-02 G
                          569.26-6.744E-03 % P 2.686E-01 7.55E-02 G

TH-234       1.6129E+00
                           63.29 1.829E+00 %(P 4.861E+00 1.46E+00 G K
                           92.80 1.331E+00 *(P 1.805E+00 5.50E-01 G
                           92.38 1.541E+00 & P 2.122E+00 6.46E-01 G

AM-241      -2.9255E-01
                           59.54-2.925E-01 %(P 1.008E+00 3.02E-01 G
   ( - This peak used in the nuclide activity average.

   * - Peak is too wide, but only one peak in library.
   ! - Peak is part of a multiplet and this area went
       negative during deconvolution.
   ? - Peak is too narrow.
   @ - Peak is too wide at FW25M, but ok at FWHM.
   % - Peak fails sensitivity test.
   $ - Peak identified, but first peak of this nuclide
       failed one or more qualification tests.
   + - Peak activity higher than counting uncertainty range.
   - - Peak activity lower than counting uncertainty range.
   = - Peak outside analysis energy range.
   & - Calculated peak centroid is not close enough to the
       library energy centroid for positive identification.
   P - Peakbackground subtraction
   } - Peak is too close to another for the activity
       to be found directly.

   Nuclide Codes:                      Peak Codes:
   T - Thermal Neutron Activation      G - Gamma Ray
   F - Fast Neutron Activation         X - X-Ray
   I - Fission Product                 P - Positron Decay
   N - Naturally Occurring Isotope     S - Single-Escape
   P - Photon Reaction                 D - Double-Escape
   C - Charged Particle Reaction       K - Key Line
   M - No MDA Calculation              A - Not in Average
   R - Coincidence Corrected           C - Coincidence Peak
   H - Halflife limit exceeded

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
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***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	9.2318E-02	9.5831E-02	2.2666E-01	2.2673E-01	2.430E-01
K-40		1.0653E+01	1.0653E+01	1.1242E+00	1.2831E+00	
MN-54	#A	-3.8121E-04	-3.8365E-04	2.7673E-01	2.7673E-01	2.718E-02
CO-57	#B	9.2224E-03	9.2907E-03	3.8775E-02	3.8779E-02	4.290E-02

CO-60	#B	-8.1299E-03	-8.1384E-03	6.8368E-02	6.8370E-02	3.484E-02
Sr-85	#A	-9.3321E-03	-9.6236E-03	3.2352E-02	3.2356E-02	3.522E-02
Kr-85	#A	-2.1570E+02	-2.1571E+02	7.2433E+02	7.2444E+02	8.131E+02
Y-88	#B	-1.0318E-04	-1.0513E-04	6.3077E-04	6.3080E-04	1.208E-02
NB-94	#B	9.4966E-03	9.4966E-03	2.4494E-02	2.4501E-02	2.758E-02
Ag-108M	#B	-1.5174E-02	-1.5174E-02	4.2504E-02	4.2513E-02	4.750E-02
CD-109	#A	7.7421E-02	7.7762E-02	1.4932E+00	1.4932E+00	1.669E+00
SN-113	#B	1.6057E-02	1.6337E-02	3.1717E-02	3.1731E-02	3.431E-02
SB-125	#B	1.9211E-02	1.9249E-02	6.0727E-02	6.0737E-02	6.858E-02
I-131	#B	7.8082E-03	1.0006E-02	2.8563E-02	2.8569E-02	2.508E-02
CS-134	#B	3.0639E-03	3.0720E-03	2.7048E-02	2.7048E-02	3.118E-02
CS-137	#A	1.4957E-02	1.4960E-02	3.2239E-02	3.2251E-02	3.589E-02
CE-139	#A	2.1391E-03	2.1703E-03	3.5206E-02	3.5206E-02	3.905E-02
EU-152	#B	2.6063E-02	2.6074E-02	1.1296E-01	1.1297E-01	1.259E-01
EU-154	#B	-8.4106E-03	-8.4160E-03	8.2748E-02	8.2749E-02	9.270E-02
EU-155	#B	8.1632E-03	8.1722E-03	1.7552E-01	1.7552E-01	1.969E-01
HG-203	#B	3.7377E-03	3.9011E-03	3.1201E-02	3.1202E-02	3.382E-02
TL-208		1.5210E-01	1.5210E-01	4.9371E-02	5.0155E-02	
PB-212		4.6530E-01	4.6530E-01	7.0930E-02	7.5900E-02	
PB-214		3.3997E-01	3.3997E-01	9.0764E-02	9.2885E-02	
BI-212	#A	2.8079E-01	2.8079E-01	2.7582E-01	2.7630E-01	2.851E-01
BI-214		2.9121E-01	2.9121E-01	8.3541E-02	8.5234E-02	
RA-224	A	6.3803E-01	6.3803E-01	8.8112E-01	8.8190E-01	
RA-226	#A	8.5596E-01	8.5596E-01	8.7981E-01	8.8121E-01	9.520E-01
AC-228		5.9429E-01	5.9429E-01	1.4673E-01	1.5073E-01	
TH-227	#B	-3.3050E-03	-3.3050E-03	3.1158E-01	3.1158E-01	3.505E-01
PA-234	#B	2.5448E-02	2.5448E-02	1.7164E-01	1.7165E-01	1.921E-01
TH-234	#B	1.6129E+00	1.6129E+00	1.9990E+00	2.0010E+00	4.861E+00
AM-241	#A	-2.9254E-01	-2.9255E-01	9.1944E-01	9.1958E-01	1.008E+00

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (269.4 to 2000.7 keV) 1.3133494E+01 pCi/gm
Total Decayed Activity (269.4 to 2000.7 keV) 1.3133494E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JPK

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 103F_13SEPT2006_098.An1

Sample description
FSS-OOL-05-10-005-F

Spectrum Filename: C:\GammaVision\Spectra\103F_13SEPT2006_098.An1

Acquisition information
Start time: 13-Sep-2006 09:28:14
Live time: 2000
Real time: 2002
Dead time: 0.10 %
Detector ID: 4

Detector system
Det 103 - DSPE-471

Calibration
Filename: D3_1LSa.Clb
Detector_103 1.0 Liter Sand Geometry

Energy Calibration
Created: 08-Aug-2005 11:09:41
Zero offset: 0.409 keV
Gain: 0.500 keV/channel
Quadratic: 1.092E-08 keV/channel^2

Efficiency Calibration
Created: 08-Aug-2005 11:11:25
Type: Polynomial
Uncertainty: 0.993 %
Coefficients: -0.264059 -5.138468 0.638383
-0.089199 0.005011 -0.000129

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.41keV)
Stop channel: 4000 (2000.67keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 1.8910E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.8910E+03) =
5.2882E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	09-Sep-2006 08:47:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	103_150K_05AUG05.Pbc 08-Aug-2005 12:54:15
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 20 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.0407

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
74.97	135.	20.07	0.99	9.052E-03	74.81	9.600	1.111E+00	PB212
77.27	165.	13.57	0.99	1.011E-02	77.11	17.500	7.939E-01	PB212
					77.11	10.700	1.298E+00	PB214
92.73	108.	34.50	1.17	1.643E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
186.08	186.	21.52	1.33	2.566E-02	185.99	3.280	1.466E+00	RA226
209.47	133.	24.11	0.84	2.470E-02				
238.72	1019.	3.69	1.09	2.320E-02	238.63	43.100	7.199E-01	PB212
241.84	123.	19.86	1.10	2.303E-02	241.00	3.900	9.773E-01	RA224
					241.92	7.470	5.113E-01	PB214
270.07	102.	26.22	1.65	2.152E-02				
277.06	65.	39.31	1.49	2.116E-02				
295.20	268.	11.50	1.14	2.025E-02	295.22	19.200	4.843E-01	PB214
300.22	81.	31.30	1.32	2.001E-02				
328.01	82.	31.14	1.49	1.874E-02				
338.22	209.	13.30	1.02	1.831E-02	338.40	12.010	6.773E-01	AC228
352.01	430.	7.70	1.26	1.775E-02	351.99	37.100	4.605E-01	PB214
463.28	95.	22.81	1.18	1.425E-02				
463.28	95.	22.81	1.18	1.425E-02	463.51	10.000	4.704E-01	SB125
510.95	164.	16.18	1.53	1.317E-02	510.72	22.500	3.311E-01	TL208
583.17	332.	8.57	1.26	1.184E-02	583.14	86.000	2.300E-01	TL208
609.33	332.	8.14	1.24	1.144E-02	609.32	46.090	4.418E-01	BI214
727.49	126.	18.20	1.42	9.961E-03	727.17	11.800	7.628E-01	BI212
768.91	68.	33.36	1.50	9.547E-03				
794.87	76.	26.43	1.75	9.309E-03				
794.87	76.	26.43	1.75	9.309E-03	795.76	85.400	6.855E-02	CS134
911.12	219.	9.93	1.62	8.401E-03	911.07	29.000	6.319E-01	AC228

964.79	65.	19.23	1.54	8.051E-03	964.00	14.580	3.910E-01	EU152
969.05	139.	10.15	1.54	8.025E-03	968.90	17.460	7.071E-01	AC228
1120.31	99.	24.89	1.23	7.212E-03	1120.28	15.040	6.398E-01	BI214
1460.85	1304.	2.81	1.94	5.932E-03	1460.75	10.700	1.447E+01	K40
1764.67	55.	13.89	1.79	5.141E-03	1764.51	15.920	4.490E-01	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
418.09	209.47	404.	133.	0.066	72.34	0.841	AC-228	s
539.29	270.07	253.	102.	0.051	78.67	1.650	AC-228	s
553.27	277.06	230.	80.	0.040	87.44	1.491	TL-208	s
599.58	300.22	237.	81.	0.041	93.91	1.317	PB-212	
655.16	328.01	228.	82.	0.041	93.42	1.490	AC-228	s
1536.88	768.91	125.	68.	0.034	100.07	1.496	BI-214	s
1928.74	964.73	45.	65.	0.033	57.33	1.538	AC-228	D

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-212	148.79	74.81	319.	135.	0.068	60.21	0.993D
PB-212	153.39	77.11	333.	165.	0.083	40.70	0.995A
TH-234	185.15	92.99	871.	123.	0.061	91.84	1.500s
RA-226	371.60	186.22	654.	138.	0.069	75.22	1.500s
PB-212	476.69	238.77	513.	1032.	0.516	13.77	1.092
RA-224	482.85	241.85	651.	106.	0.053	105.99	1.500
PB-214	589.55	295.20	276.	263.	0.132	34.50	1.142
AC-228	675.58	338.22	219.	208.	0.104	39.89	1.015s
PB-214	703.16	352.01	236.	424.	0.212	23.10	1.265
SB-125	925.57	463.23	134.	70.	0.035	77.34	1.500
TL-208	1021.01	510.95	207.	137.	0.069	48.54	1.534s
TL-208	1165.43	583.17	149.	328.	0.164	25.71	1.261
BI-214	1217.75	609.33	124.	326.	0.163	24.42	1.237
BI-212	1454.05	727.49	108.	126.	0.063	54.59	1.418s
CS-134	1589.42	795.18	54.	56.	0.028	68.69	1.500s
AC-228	1821.26	911.12	83.	215.	0.108	29.80	1.622
EU-152	1928.61	964.80	104.	49.	0.024	97.50	1.538
AC-228	1936.81	968.90	30.	139.	0.069	30.46	1.541D
BI-214	2239.59	1120.31	126.	97.	0.049	74.68	1.228
K-40	2920.56	1460.85	33.	1285.	0.643	8.44	1.938
BI-214	3528.09	1764.67	5.	51.	0.026	41.66	1.790

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	MDA Value pCi/gm	COMMENTS
BE-7		1.1192E-02					
			477.56	1.119E-02	&(	3.247E-01 9.45E-02	G
K-40		1.4471E+01					
			1460.75	1.447E+01	(P	3.306E-01 4.13E-01	G
MN-54		-1.9993E-03					
			834.81	-1.999E-03	%(P	3.935E-02 1.13E-02	G
CO-57		-5.7592E-03					
			122.07	-5.759E-03	%(P	5.093E-02 1.52E-02	G K
			136.43	0.000E+00	%	3.861E-01 1.15E-01	G
CO-60		-3.6572E-03					
			1332.51	-3.657E-03	%(P	3.373E-02 8.98E-03	G K
			1173.23	-3.250E-03	& P	3.902E-02 1.09E-02	G K
Sr-85		-2.0178E-02					
			514.00	-2.018E-02	%(	4.632E-02 1.40E-02	G
Kr-85		-4.4632E+02					
			513.99	-4.463E+02	%(	1.024E+03 3.10E+02	G
Y-88		-9.3260E-05					
			1836.01	-9.326E-05	%(P	3.897E-02 1.06E-02	G K
			898.02	3.978E-04	% P	4.189E-02 1.19E-02	G
NB-94		-6.5888E-05					
			871.10	-6.589E-05	&(	2.797E-02 7.81E-03	G K
			702.50	1.406E-04	%	2.106E-02 5.83E-03	G K
Ag-108M		-8.9337E-03					
			722.95	-8.934E-03	%(	3.947E-02 1.16E-02	G K
			614.37	-1.121E-02	% P	3.805E-02 1.13E-02	G
			433.93	5.611E-04	%	3.012E-02 8.72E-03	G
CD-109		1.1506E+00					
			88.04	1.151E+00	%(	1.752E+00 5.35E-01	G
SN-113		1.7061E-04					
			391.71	1.706E-04	&(	4.949E-02 1.44E-02	G K
			255.04	1.538E-01	%	1.425E+00 4.22E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	1.0567E-01						
		427.95	2.252E-02	%(P	8.798E-02	2.61E-02	G K
		600.77	1.828E-02	% P	1.639E-01	4.76E-02	G
		636.15	-1.139E-03	% P	2.926E-01	8.39E-02	G
		463.51	3.518E-01	(P	2.852E-01	9.23E-02	G
		176.29	7.490E-02	&	5.485E-01	1.64E-01	G
I-131	4.2781E-04						
		364.48	4.278E-04	&(P	4.217E-02	1.22E-02	G K
		636.97	6.876E-03	%	5.791E-01	1.66E-01	G
		284.29	9.160E-02	% P	7.119E-01	2.11E-01	G
CS-134	1.8232E-02						
		604.66	-9.821E-03	%(	3.625E-02	1.08E-02	G K
		795.76	5.029E-02	(P	3.330E-02	1.15E-02	G
		569.29	-3.171E-02	& P	2.009E-01	5.82E-02	G
		801.84	-1.320E-02	& P	3.689E-01	1.03E-01	G
CS-137	2.7539E-02						
		661.62	2.754E-02	%(P	4.487E-02	1.37E-02	G
CE-139	-4.1822E-03						
		165.85	-4.182E-03	%(	4.347E-02	1.30E-02	G
EU-152	9.8143E-02						
		121.78	-9.619E-04	%(P	1.426E-01	4.24E-02	G K
		344.30	4.572E-02	% P	9.511E-02	2.88E-02	G
		1408.08	1.938E-02	%	1.307E-01	3.66E-02	G
		964.00	2.969E-01	&(P	3.063E-01	9.76E-02	G
		1112.07	1.435E-02	%	2.689E-01	7.63E-02	G
		778.90	-2.444E-02	&	2.636E-01	7.61E-02	G
EU-154	-3.7760E-03						
		123.10	-3.776E-03	%(	8.560E-02	2.54E-02	G K
		1274.80	-1.516E-02	&	9.203E-02	2.63E-02	G
		723.30	-4.121E-02	%	1.813E-01	5.35E-02	G
		1004.80	-2.984E-02	%	2.052E-01	5.93E-02	G
EU-155	-4.2666E-03						
		86.45	-4.267E-03	&(	2.248E-01	6.70E-02	G K
		105.31	1.053E-02	%	2.298E-01	6.85E-02	G
HG-203	-8.9974E-03						
		279.17	-8.997E-03	%(P	4.070E-02	1.22E-02	G K
		72.87	-1.074E+00	% P	2.216E+00	6.72E-01	G
		70.83	-1.870E+00	&	4.195E+00	1.27E+00	G
		82.50	-4.448E-01	&	2.733E+00	8.14E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	2.2996E-01						
		583.14	2.300E-01	(P	4.183E-02	2.00E-02	G
		510.72	3.311E-01	+ P	1.681E-01	6.40E-02	G
PB-212	7.5386E-01						
		238.63	7.376E-01	(P	7.737E-02	3.42E-02	G K
							Energy duplication
		77.11	6.673E-01	} P	3.545E-01	9.05E-02	G
		74.81	1.111E+00	+ P	7.066E-01	2.28E-01	G
PB-214	4.6863E-01						
		351.99	4.605E-01	(P	8.054E-02	3.59E-02	G K
		295.22	4.843E-01	(P	1.472E-01	5.65E-02	G
							Energy duplication
		77.11	3.816E-02	} P	8.347E-01	2.01E-01	G
		241.92	1.669E-02	%	6.045E-01	1.80E-01	G
BI-212	7.6277E-01						
		727.17	7.628E-01	@(P	3.115E-01	1.39E-01	G K
		1620.56	3.524E-01	% P	9.336E-01	2.76E-01	G
		785.42	5.629E-01	%	1.619E+00	4.83E-01	G
BI-214	4.4362E-01						
		609.32	4.418E-01	(P	7.403E-02	3.67E-02	G K
		1764.51	4.490E-01	(P	1.106E-01	6.63E-02	G
		1120.28	6.398E-01	+ P	3.623E-01	1.62E-01	G
RA-224	8.4387E-01						
		241.00	8.439E-01	(	9.662E-01	2.98E-01	G
RA-226	1.1716E+00						
		185.99	1.172E+00	*(P	1.035E+00	3.21E-01	G
AC-228	6.6371E-01						
		911.07	6.319E-01	(P	1.321E-01	6.37E-02	G K
		968.90	7.072E-01	(P	1.441E-01	7.19E-02	G
		338.40	6.773E-01	@(P	2.329E-01	9.05E-02	G
TH-227	-1.9774E-01						
		236.00	-1.977E-01	%(	3.773E-01	1.15E-01	G K
		256.25	-1.022E-02	% P	4.184E-01	1.23E-01	G
PA-234	-3.6963E-02						
		98.44	-3.696E-02	%(P	1.939E-01	5.80E-02	G K
		946.00	3.856E-03	& P	1.853E-01	5.28E-02	G
		131.28	-2.666E-03	% P	1.912E-01	5.68E-02	G
		94.67	-2.103E-02	% P	3.813E-01	1.14E-01	G
		883.24	-4.104E-02	&	2.771E-01	8.02E-02	G
		926.70	-4.391E-02	%	2.608E-01	7.50E-02	G

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 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26-4.715E-02 & P 2.969E-01 8.60E-02 G

TH-234       1.8570E+00
                           63.29 1.701E+00 %(P 5.985E+00 1.80E+00 G K
                           92.80 1.477E+00 % P 2.046E+00 6.23E-01 G
                           92.38 2.093E+00 *(P 2.391E+00 7.33E-01 G

AM-241      -2.2946E-01
                           59.54-2.295E-01 &(P 1.088E+00 3.26E-01 G
   ( - This peak used in the nuclide activity average.

   * - Peak is too wide, but only one peak in library.
   ! - Peak is part of a multiplet and this area went
       negative during deconvolution.
   ? - Peak is too narrow.
   @ - Peak is too wide at FW25M, but ok at FWHM.
   % - Peak fails sensitivity test.
   $ - Peak identified, but first peak of this nuclide
       failed one or more qualification tests.
   + - Peak activity higher than counting uncertainty range.
   - - Peak activity lower than counting uncertainty range.
   = - Peak outside analysis energy range.
   & - Calculated peak centroid is not close enough to the
       library energy centroid for positive identification.
   P - Peakbackground subtraction
   } - Peak is too close to another for the activity
       to be found directly.

   Nuclide Codes:                      Peak Codes:
   T - Thermal Neutron Activation      G - Gamma Ray
   F - Fast Neutron Activation         X - X-Ray
   I - Fission Product                 P - Positron Decay
   N - Naturally Occurring Isotope     S - Single-Escape
   P - Photon Reaction                 D - Double-Escape
   C - Charged Particle Reaction       K - Key Line
   M - No MDA Calculation              A - Not in Average
   R - Coincidence Corrected           C - Coincidence Peak
   H - Halflife limit exceeded

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
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***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	1.0621E-02	1.1192E-02	2.8357E-01	2.8357E-01	3.081E-01
K-40		1.4471E+01	1.4471E+01	1.2392E+00	1.4971E+00	
MN-54	#A	-1.9815E-03	-1.9993E-03	4.5373E-02	4.5374E-02	3.900E-02
CO-57	#B	-5.6999E-03	-5.7592E-03	4.8199E-02	4.8200E-02	5.041E-02
CO-60	#B	-3.6519E-03	-3.6572E-03	2.6573E-01	2.6573E-01	3.368E-02

Sr-85	#A	-1.9328E-02	-2.0178E-02	4.2018E-02	4.2034E-02	4.437E-02
Kr-85	#A	-4.4630E+02	-4.4632E+02	9.2917E+02	9.2953E+02	1.024E+03
Y-88	#B	-9.0848E-05	-9.3260E-05	4.0030E-03	4.0030E-03	3.796E-02
NB-94	#B	-6.5888E-05	-6.5888E-05	2.3444E-02	2.3444E-02	2.797E-02
Ag-108M	#B	-8.9332E-03	-8.9337E-03	3.4910E-02	3.4914E-02	3.947E-02
CD-109	#A	1.1435E+00	1.1506E+00	1.6054E+00	1.6067E+00	1.741E+00
SN-113	#B	1.6652E-04	1.7061E-04	4.3345E-02	4.3345E-02	4.830E-02
SB-125	#F	1.0538E-01	1.0567E-01	8.3217E-02	8.3442E-02	8.773E-02
I-131	#B	3.0228E-04	4.2781E-04	3.6611E-02	3.6611E-02	2.980E-02
CS-134	#B	1.8165E-02	1.8232E-02	1.2544E-02	1.2589E-02	3.611E-02
CS-137	#A	2.7532E-02	2.7539E-02	4.1244E-02	4.1275E-02	4.486E-02
CE-139	#A	-4.0981E-03	-4.1822E-03	3.8886E-02	3.8887E-02	4.260E-02
EU-152	#B	9.8084E-02	9.8143E-02	9.6762E-02	9.6915E-02	1.425E-01
EU-154	#B	-3.7727E-03	-3.7760E-03	7.6255E-02	7.6255E-02	8.552E-02
EU-155	#B	-4.2601E-03	-4.2666E-03	2.0102E-01	2.0102E-01	2.245E-01
HG-203	#B	-8.4740E-03	-8.9974E-03	3.6596E-02	3.6600E-02	3.834E-02
TL-208		2.2996E-01	2.2996E-01	5.9909E-02	6.1378E-02	
PB-212		7.5386E-01	7.5386E-01	1.0502E-01	1.1377E-01	
PB-214		4.6863E-01	4.6863E-01	9.8718E-02	1.0240E-01	
BI-212	#	7.6277E-01	7.6277E-01	4.1800E-01	4.2034E-01	
BI-214		4.4362E-01	4.4362E-01	1.1049E-01	1.1346E-01	
RA-224	A	8.4387E-01	8.4387E-01	8.9442E-01	8.9576E-01	9.662E-01
RA-226	#	1.1716E+00	1.1716E+00	9.6405E-01	9.6644E-01	1.035E+00
AC-228		6.6371E-01	6.6371E-01	1.3001E-01	1.3560E-01	
TH-227	#B	-1.9774E-01	-1.9774E-01	3.4395E-01	3.4414E-01	3.773E-01
PA-234	#B	-3.6963E-02	-3.6963E-02	1.8916E-01	1.8918E-01	1.939E-01
TH-234	#B	1.8570E+00	1.8570E+00	1.9506E+00	1.9533E+00	5.985E+00
AM-241	#A	-2.2945E-01	-2.2946E-01	9.9290E-01	9.9298E-01	1.088E+00

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (1120.0 to 2000.7 keV) 1.8637100E+01 pCi/gm
Total Decayed Activity (1120.0 to 2000.7 keV) 1.8637100E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JPK

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 103F_13SEPT2006_0808.An1

Sample description
FSS-OOL-05-10-002-F

Spectrum Filename: C:\GammaVision\Spectra\103F_13SEPT2006_0808.An1

Acquisition information
Start time: 13-Sep-2006 08:08:59
Live time: 2000
Real time: 2002
Dead time: 0.10 %
Detector ID: 4

Detector system
Det 103 - DSPE-471

Calibration
Filename: D3_1LSa.Clb
Detector_103 1.0 Liter Sand Geometry

Energy Calibration
Created: 08-Aug-2005 11:09:41
Zero offset: 0.409 keV
Gain: 0.500 keV/channel
Quadratic: 1.092E-08 keV/channel^2

Efficiency Calibration
Created: 08-Aug-2005 11:11:25
Type: Polynomial
Uncertainty: 0.993 %
Coefficients: -0.264059 -5.138468 0.638383
-0.089199 0.005011 -0.000129

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.41keV)
Stop channel: 4000 (2000.67keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 1.9400E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.9400E+03) =
5.1546E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	09-Sep-2006 08:15:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	103_150K_05AUG05.Pbc 08-Aug-2005 12:54:15
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 19 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.0741

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
74.89	154.	17.93	0.99	9.052E-03	74.81	9.600	1.232E+00	PB212
77.19	191.	1.41	0.99	1.011E-02	77.11	17.500	7.799E-01	PB212
					77.11	10.700	1.275E+00	PB214
87.11	100.	26.81	1.00	1.436E-02	86.45	32.740	1.518E-01	EU155
					88.04	3.790	1.262E+00	CD109
89.92	98.	29.02	1.00	1.542E-02				
93.15	134.	20.83	1.00	1.657E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
128.88	89.	38.89	1.23	2.435E-02				
186.28	199.	22.41	0.98	2.566E-02	185.99	3.280	1.542E+00	RA226
209.98	131.	27.39	1.63	2.468E-02				
238.72	1137.	3.37	1.09	2.319E-02	238.63	43.100	7.838E-01	PB212
241.75	161.	16.24	1.09	2.303E-02	241.00	3.900	1.243E+00	RA224
					241.92	7.470	6.502E-01	PB214
270.26	130.	25.08	1.79	2.151E-02				
295.33	284.	8.46	1.13	2.025E-02	295.22	19.200	5.023E-01	PB214
299.80	61.	29.20	1.13	2.003E-02				
328.68	75.	29.43	1.13	1.871E-02				
338.17	236.	13.13	1.36	1.831E-02	338.40	12.010	7.432E-01	AC228
352.05	507.	6.87	1.10	1.775E-02	351.99	37.100	5.300E-01	PB214
462.95	53.	33.78	1.23	1.426E-02				
462.95	53.	33.78	1.23	1.426E-02	463.51	10.000	PBC<MDA	SB125
510.80	168.	12.96	1.18	1.317E-02	510.72	22.500	3.310E-01	TL208
583.16	394.	7.33	1.17	1.184E-02	583.14	86.000	2.663E-01	TL208
609.37	356.	7.88	1.28	1.144E-02	609.32	46.090	4.615E-01	BI214
727.37	104.	18.14	0.84	9.963E-03	727.17	11.800	6.132E-01	BI212
768.41	68.	24.12	1.68	9.552E-03				

795.04	38.	36.65	1.12	9.308E-03				
795.04	38.	36.65	1.12	9.308E-03	795.76	85.400	3.381E-02	CS134
860.75	61.	24.30	1.25	8.766E-03				
911.32	284.	7.78	1.53	8.400E-03	911.07	29.000	8.029E-01	AC228
968.08	202.	11.10	1.68	8.031E-03	968.90	17.460	1.004E+00	AC228
1120.52	79.	22.24	1.18	7.211E-03	1120.28	15.040	4.978E-01	BI214
1460.87	1081.	3.15	1.96	5.932E-03	1460.75	10.700	1.166E+01	K40
1764.58	83.	13.00	1.97	5.142E-03	1764.51	15.920	6.768E-01	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
173.40	87.11	313.	100.	0.050	80.44	1.001	PB-214	lD
179.01	89.91	357.	98.	0.049	87.07	1.002	PB-214	lD
256.93	128.88	500.	117.	0.058	85.77	1.232	AC-228	s
419.11	209.98	480.	131.	0.065	82.16	1.633	NP-239	s
539.67	270.26	343.	130.	0.065	75.25	1.788	AC-228	s
598.74	299.72	127.	61.	0.030	87.61	1.130	TH-227	lD
656.51	328.68	190.	75.	0.038	88.30	1.130	LA-140	s
1535.88	768.41	68.	68.	0.034	72.37	1.677	BI-214	M
1720.55	860.75	58.	61.	0.031	72.91	1.251	TL-208	

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.
M - Peak is close to a library peak.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-212	148.79	74.81	320.	154.	0.077	53.80	0.993D
PB-212	153.39	77.11	331.	191.	0.096	4.22	0.995A
TH-234	185.10	92.96	852.	133.	0.066	84.99	1.500s
TH-234	185.10	92.96	834.	134.	0.067	83.56	1.500s
RA-226	371.37	186.10	693.	183.	0.092	69.00	0.980s
PB-212	476.67	238.76	676.	1064.	0.532	14.76	1.088
RA-224	482.41	241.63	778.	121.	0.061	101.48	1.500
PB-214	589.65	295.25	324.	273.	0.136	36.07	1.070
AC-228	675.48	338.17	258.	235.	0.117	39.38	1.355
PB-214	703.24	352.05	249.	501.	0.251	20.61	1.095
SB-125	925.00	462.94	134.	47.	0.023	110.48	1.500
TL-208	1020.72	510.80	148.	141.	0.070	38.88	1.182s
TL-208	1165.42	583.16	127.	389.	0.195	22.00	1.174s
CS-134	1213.30	607.10	243.	-70.	-0.035	100.58	1.500s
BI-214	1217.84	609.37	141.	349.	0.175	23.63	1.276
BI-212	1453.81	727.37	90.	104.	0.052	54.43	0.842s
CS-134	1588.67	794.81	37.	38.	0.019	82.99	1.500
AC-228	1821.68	911.32	67.	281.	0.140	23.33	1.533s
AC-228	1935.18	968.08	89.	202.	0.101	33.31	1.682s
BI-214	2240.01	1120.52	74.	78.	0.039	66.71	1.182s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
K-40	2920.61	1460.87	38.	1062.	0.531	9.46	1.958
BI-214	3527.91	1764.58	10.	80.	0.040	39.01	1.970

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	MDA Value pCi/gm	COMMENTS
BE-7		8.2079E-02					
			477.56	8.208E-02	&(	2.712E-01	8.07E-02 G
K-40		1.1656E+01					
			1460.75	1.166E+01	(P	3.447E-01	3.74E-01 G
MN-54		2.1258E-02					
			834.81	2.126E-02	%(P	3.180E-02	9.88E-03 G
CO-57		4.2895E-03					
			122.07	4.289E-03	%(P	3.780E-02	1.12E-02 G K
			136.43	1.733E-03	&	3.805E-01	1.13E-01 G
CO-60		4.7260E-03					
			1332.51	4.726E-03	&(P	3.253E-02	9.08E-03 G K
			1173.23	6.028E-03	% P	4.270E-02	1.23E-02 G K
Sr-85		-1.8290E-02					
			514.00	-1.829E-02	%(	4.432E-02	1.34E-02 G
Kr-85		-4.0475E+02					
			513.99	-4.048E+02	%(	9.805E+02	2.96E+02 G
Y-88		-2.3190E-04					
			1836.01	-2.319E-04	&(P	2.615E-02	6.75E-03 G K
			898.02	-3.562E-03	% P	2.580E-02	7.21E-03 G
NB-94		5.5067E-04					
			871.10	5.507E-04	%(	3.139E-02	8.89E-03 G K
			702.50	1.231E-03	%	3.552E-02	1.03E-02 G K
Ag-108M		-1.7466E-02					
			722.95	-1.747E-02	%(	4.418E-02	1.33E-02 G K
			614.37	-7.572E-03	% P	3.829E-02	1.13E-02 G
			433.93	1.058E-02	%	3.089E-02	9.25E-03 G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CD-109	1.1016E+00						
		88.04	1.102E+00	&(	1.687E+00	5.15E-01	G
SN-113	1.3218E-02						
		391.71	1.322E-02	&(	4.620E-02	1.38E-02	G K
		255.04	1.406E-02	%	1.395E+00	4.11E-01	G
SB-125	5.7822E-02						
		427.95	-5.797E-05	&(P	1.107E-01	3.23E-02	G K
		600.77	1.995E-02	% P	1.562E-01	4.54E-02	G
		636.15	-9.523E-02	& P	2.684E-01	7.99E-02	G
		463.51	2.291E-01	(P	2.774E-01	8.67E-02	G
		176.29	1.014E-01	%	5.008E-01	1.50E-01	G
I-131	8.6392E-03						
		364.48	8.639E-03	%(P	4.825E-02	1.43E-02	G K
		636.97	0.000E+00	%	6.690E-01	1.93E-01	G
		284.29	-1.423E-03	& P	6.409E-01	1.88E-01	G
CS-134	-4.3786E-02						
		604.66	-4.379E-02	?(	4.690E-02	1.47E-02	G K
		795.76	3.362E-02	+ P	2.734E-02	9.32E-03	G
		569.29	-2.529E-02	% P	2.136E-01	6.19E-02	G
		801.84	-1.670E-02	% P	3.572E-01	1.00E-01	G
CS-137	9.2932E-03						
		661.62	9.293E-03	%(P	4.007E-02	1.18E-02	G
CE-139	-2.7990E-04						
		165.85	-2.799E-04	%(	3.820E-02	1.13E-02	G
EU-152	-1.1025E-03						
		121.78	-1.102E-03	%(P	1.054E-01	3.11E-02	G K
		344.30	4.029E-02	& P	9.091E-02	2.75E-02	G
		1408.08	4.528E-02	&	1.381E-01	4.06E-02	G
		964.00	1.428E-01	% P	2.992E-01	9.06E-02	G
		1112.07	1.309E-01	%	2.256E-01	6.96E-02	G
		778.90	5.047E-02	%	2.147E-01	6.28E-02	G
EU-154	-9.4066E-03						
		123.10	-9.407E-03	&(	1.046E-01	3.12E-02	G K
		1274.80	3.306E-02	%	9.782E-02	2.90E-02	G
		723.30	-9.225E-02	%	2.201E-01	6.64E-02	G
		1004.80	-3.101E-02	%	1.627E-01	4.69E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
EU-155	-6.4324E-03						
		86.45	-6.432E-03	%(	2.303E-01	6.87E-02	G K
		105.31	3.600E-02	%	2.205E-01	6.61E-02	G
HG-203	2.4433E-02						
		279.17	2.443E-02	&(P	3.352E-02	1.03E-02	G K
		72.87	-4.458E-01	& P	1.913E+00	5.74E-01	G
		70.83	-3.116E-02	%	4.668E+00	1.39E+00	G
		82.50	-2.302E-01	%	3.674E+00	1.10E+00	G
TL-208	2.6634E-01						
		583.14	2.663E-01	@(P	3.769E-02	1.97E-02	G
		510.72	3.310E-01	+ P	1.397E-01	5.10E-02	G
PB-212	7.5242E-01						
		238.63	7.413E-01	(P	8.629E-02	3.69E-02	G K
							Energy duplication
		77.11	7.524E-01	} P	3.442E-01	1.06E-02	G
		74.81	1.232E+00	+ P	6.902E-01	2.25E-01	G
PB-214	5.1605E-01						
		351.99	5.300E-01	(P	8.061E-02	3.68E-02	G K
		295.22	4.890E-01	(P	1.552E-01	5.97E-02	G
							Energy duplication
		77.11	0.000E+00	} P	8.194E-01	0.00E+00	G
		241.92	1.452E-01	%	5.748E-01	1.73E-01	G
BI-212	6.1317E-01						
		727.17	6.132E-01	*(P	2.787E-01	1.12E-01	G K
		1620.56	1.588E-01	% P	7.983E-01	2.21E-01	G
		785.42	3.339E-01	%	1.583E+00	4.64E-01	G
BI-214	4.7044E-01						
		609.32	4.615E-01	(P	7.660E-02	3.70E-02	G K
		1764.51	6.768E-01	+ P	1.514E-01	9.16E-02	G
		1120.28	4.978E-01	@(P	2.757E-01	1.13E-01	G
RA-224	9.3722E-01						
		241.00	9.372E-01	(	1.027E+00	3.17E-01	G
RA-226	1.5146E+00						
		185.99	1.515E+00	@(P	1.037E+00	3.73E-01	G
AC-228	7.8543E-01						
		911.07	8.029E-01	@(P	1.169E-01	6.32E-02	G K
		968.90	1.004E+00	+ P	2.319E-01	1.12E-01	G
		338.40	7.432E-01	(P	2.460E-01	9.80E-02	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments

TH-227      -6.5065E-02
                          236.00-6.506E-02 %(  3.164E-01 9.48E-02 G K
                          256.25 1.237E-01 & P 4.327E-01 1.30E-01 G

PA-234       6.5792E-03
                           98.44 6.579E-03 %(P 2.117E-01 6.31E-02 G K
                          946.00 5.984E-02 & P 1.506E-01 4.51E-02 G
                          131.28-5.433E-02 % P 1.968E-01 5.92E-02 G
                           94.67-1.598E-01 % P 3.880E-01 1.17E-01 G
                          883.24 1.914E-02 &   2.645E-01 7.56E-02 G
                          926.70 8.571E-02 &   1.902E-01 5.74E-02 G
                          569.26-3.718E-02 % P 3.157E-01 9.15E-02 G

TH-234       2.2268E+00
                           63.29 2.497E+00 &(P 5.310E+00 1.61E+00 G K
                           92.80 1.891E+00  (P 1.937E+00 5.96E-01 G
                           92.38 2.210E+00  (P 2.306E+00 7.09E-01 G

AM-241      -2.8513E-01
                           59.54-2.851E-01 %(P 1.015E+00 3.05E-01 G
   ( - This peak used in the nuclide activity average.

   * - Peak is too wide, but only one peak in library.
   ! - Peak is part of a multiplet and this area went
       negative during deconvolution.
   ? - Peak is too narrow.
   @ - Peak is too wide at FW25M, but ok at FWHM.
   % - Peak fails sensitivity test.
   $ - Peak identified, but first peak of this nuclide
       failed one or more qualification tests.
   + - Peak activity higher than counting uncertainty range.
   - - Peak activity lower than counting uncertainty range.
   = - Peak outside analysis energy range.
   & - Calculated peak centroid is not close enough to the
       library energy centroid for positive identification.
   P - Peakbackground subtraction
   } - Peak is too close to another for the activity
       to be found directly.

   Nuclide Codes:                      Peak Codes:
   T - Thermal Neutron Activation      G - Gamma Ray
   F - Fast Neutron Activation         X - X-Ray
   I - Fission Product                 P - Positron Decay
   N - Naturally Occurring Isotope     S - Single-Escape
   P - Photon Reaction                 D - Double-Escape
   C - Charged Particle Reaction       K - Key Line
   M - No MDA Calculation              A - Not in Average
```

R - Coincidence Corrected C - Coincidence Peak
H - Halflife limit exceeded

- -

***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	7.7930E-02	8.2079E-02	2.4221E-01	2.4225E-01	2.575E-01
K-40		1.1656E+01	1.1656E+01	1.1220E+00	1.3103E+00	
MN-54	#A	2.1071E-02	2.1258E-02	2.9629E-02	2.9655E-02	3.152E-02
CO-57	#B	4.2457E-03	4.2895E-03	3.3744E-02	3.3745E-02	3.741E-02
CO-60	#B	4.7192E-03	4.7260E-03	2.7235E-02	2.7237E-02	3.248E-02
Sr-85	#A	-1.7525E-02	-1.8290E-02	4.0138E-02	4.0153E-02	4.247E-02
Kr-85	#A	-4.0474E+02	-4.0475E+02	8.8793E+02	8.8824E+02	9.805E+02
Y-88	#B	-2.2595E-04	-2.3190E-04	4.6323E-02	4.6323E-02	2.548E-02
NB-94	#B	5.5067E-04	5.5067E-04	2.6678E-02	2.6678E-02	3.139E-02
Ag-108M	#B	-1.7465E-02	-1.7466E-02	3.9873E-02	3.9886E-02	4.418E-02
CD-109	#A	1.0949E+00	1.1016E+00	1.5460E+00	1.5472E+00	1.677E+00
SN-113	#B	1.2904E-02	1.3218E-02	4.1373E-02	4.1380E-02	4.510E-02
SB-125	#B	5.7664E-02	5.7822E-02	6.5627E-02	6.5713E-02	1.104E-01
I-131	#B	6.1216E-03	8.6392E-03	4.2809E-02	4.2812E-02	3.419E-02
CS-134	#A	-4.3625E-02	-4.3786E-02	4.4042E-02	4.4115E-02	4.673E-02
CS-137	#A	9.2909E-03	9.2932E-03	3.5395E-02	3.5399E-02	4.006E-02
CE-139	#A	-2.7431E-04	-2.7990E-04	3.3951E-02	3.3952E-02	3.744E-02
EU-152	#B	-1.1018E-03	-1.1025E-03	1.4906E+00	1.4906E+00	1.053E-01
EU-154	#B	-9.3982E-03	-9.4066E-03	9.3744E-02	9.3746E-02	1.045E-01
EU-155	#B	-6.4226E-03	-6.4324E-03	2.0614E-01	2.0614E-01	2.299E-01
HG-203	#B	2.3023E-02	2.4433E-02	3.1022E-02	3.1054E-02	3.159E-02
TL-208	#	2.6634E-01	2.6634E-01	5.9234E-02	6.1220E-02	
PB-212		7.5242E-01	7.5242E-01	1.1230E-01	1.2050E-01	
PB-214		5.1605E-01	5.1605E-01	1.0755E-01	1.1164E-01	
BI-212	#	6.1317E-01	6.1317E-01	3.3532E-01	3.3721E-01	
BI-214		4.7044E-01	4.7044E-01	1.1321E-01	1.1646E-01	
RA-224	#A	9.3722E-01	9.3722E-01	9.5113E-01	9.5268E-01	1.027E+00
RA-226	#	1.5146E+00	1.5146E+00	1.1190E+00	1.1224E+00	
AC-228		7.8543E-01	7.8543E-01	1.8092E-01	1.8658E-01	
TH-227	#B	-6.5065E-02	-6.5065E-02	2.8426E-01	2.8428E-01	3.164E-01
PA-234	#B	6.5792E-03	6.5792E-03	1.8921E-01	1.8921E-01	2.117E-01
TH-234	#B	2.2268E+00	2.2268E+00	1.7480E+00	1.7524E+00	5.310E+00
AM-241	#A	-2.8512E-01	-2.8513E-01	9.2590E-01	9.2603E-01	1.015E+00

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.

H - Halflife limit exceeded

YAEC Chemistry Lab Spectrum name: 103F_13SEPT2006_0808.An1

---------- S U M M A R Y ----------

Total Activity (86.9 to 2000.7 keV) 1.6574108E+01 pCi/gm
Total Decayed Activity (86.9 to 2000.7 keV) 1.6574116E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JPK

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 103F_13SEPT2006_0848.An1

Sample description
FSS-OOL-05-10-018-F

Spectrum Filename: C:\GammaVision\Spectra\103F_13SEPT2006_0848.An1

Acquisition information
Start time: 13-Sep-2006 08:48:28
Live time: 2000
Real time: 2002
Dead time: 0.10 %
Detector ID: 4

Detector system
Det 103 - DSPE-471

Calibration
Filename: D3_1LSa.Clb
Detector_103 1.0 Liter Sand Geometry

Energy Calibration
Created: 08-Aug-2005 11:09:41
Zero offset: 0.409 keV
Gain: 0.500 keV/channel
Quadratic: 1.092E-08 keV/channel^2

Efficiency Calibration
Created: 08-Aug-2005 11:11:25
Type: Polynomial
Uncertainty: 0.993 %
Coefficients: -0.264059 -5.138468 0.638383
-0.089199 0.005011 -0.000129

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.41keV)
Stop channel: 4000 (2000.67keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 2.0550E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 2.0550E+03) =
4.8662E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	09-Sep-2006 13:55:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	103_150K_05AUG05.Pbc 08-Aug-2005 12:54:15
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 18 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.0521

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
74.97	116.	21.88	0.99	9.052E-03	74.81	9.600	8.766E-01	PB212
77.27	142.	14.57	0.99	1.011E-02	77.11	17.500	6.679E-01	PB212
					77.11	10.700	1.092E+00	PB214
93.08	83.	38.54	1.50	1.631E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
					94.67	15.500	PBC<MDA	PA234
93.08	90.	35.77	1.50	1.645E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
					94.67	15.500	PBC<MDA	PA234
186.18	126.	29.40	1.41	2.566E-02	185.99	3.280	PBC<MDA	RA226
209.21	98.	36.07	0.84	2.472E-02				
238.70	801.	4.16	1.09	2.320E-02	238.63	43.100	5.191E-01	PB212
241.31	136.	19.53	1.09	2.306E-02	241.00	3.900	9.969E-01	RA224
					241.92	7.470	5.216E-01	PB214
270.65	110.	25.27	2.12	2.149E-02				
295.18	246.	12.14	1.04	2.025E-02	295.22	19.200	4.098E-01	PB214
300.17	64.	29.96	1.51	2.001E-02				
338.45	178.	15.68	1.06	1.830E-02	338.40	12.010	5.290E-01	AC228
351.91	384.	7.64	1.24	1.776E-02	351.99	37.100	3.780E-01	PB214
463.54	50.	32.64	1.31	1.425E-02	463.51	10.000	2.278E-01	SB125
511.09	140.	17.43	2.16	1.316E-02	510.72	22.500	2.514E-01	TL208
583.12	303.	7.98	1.26	1.184E-02	583.14	86.000	1.928E-01	TL208
609.38	297.	9.13	1.28	1.144E-02	609.32	46.090	3.626E-01	BI214
726.94	63.	20.67	1.57	9.967E-03	727.17	11.800	3.507E-01	BI212
859.94	73.	20.35	1.75	8.772E-03				
911.06	194.	8.92	1.65	8.401E-03	911.07	29.000	5.143E-01	AC228
964.37	46.	23.14	1.54	8.054E-03	964.00	14.580	2.534E-01	EU152

969.01	100.	12.44	1.54	8.025E-03	968.90	17.460	4.701E-01	AC228
1120.10	61.	25.20	1.88	7.212E-03	1120.28	15.040	3.693E-01	BI214
1460.84	896.	3.44	1.91	5.932E-03	1460.75	10.700	9.089E+00	K40

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
1620.42	15.	36.94	1.26	5.488E-03	1620.56	2.750	6.604E-01	BI212
1764.83	55.	13.13	2.17	5.142E-03	1764.51	15.920	4.397E-01	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
417.57	209.21	445.	98.	0.049	108.21	0.840	AC-228	
540.44	270.65	262.	110.	0.055	75.81	2.125	AC-228	s
599.49	300.17	144.	64.	0.032	89.88	1.511	PB-212	s
1718.92	859.94	42.	73.	0.037	61.06	1.752	TL-208	
1927.94	964.36	32.	47.	0.024	66.50	1.538	AC-228	D

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-212	148.79	74.81	282.	116.	0.058	65.64	0.993D
PB-212	153.39	77.11	271.	142.	0.071	43.70	0.995A
RA-226	371.03	185.94	623.	102.	0.051	95.77	1.500s
PB-212	476.76	238.80	412.	837.	0.418	15.21	1.097
RA-224	482.36	241.60	515.	141.	0.071	72.71	1.500
PB-214	482.05	241.45	512.	120.	0.060	84.23	1.500
PB-214	589.52	295.18	244.	242.	0.121	36.41	1.044
AC-228	676.04	338.45	208.	177.	0.088	47.05	1.057s
PB-214	702.96	351.91	182.	379.	0.189	22.92	1.237
SB-125	925.35	463.11	99.	38.	0.019	116.49	1.500s
TL-208	1021.29	511.09	165.	113.	0.057	52.29	2.155s
TL-208	1165.35	583.12	92.	299.	0.149	23.94	1.260
BI-214	1217.86	609.38	125.	291.	0.145	27.40	1.276
BI-212	1452.96	726.94	45.	63.	0.031	62.02	1.570s
AC-228	1821.15	911.06	42.	191.	0.095	26.77	1.651
AC-228	1936.81	968.90	28.	100.	0.050	37.26	1.541D
BI-214	2239.17	1120.10	57.	61.	0.030	75.60	1.884s
K-40	2920.54	1460.84	33.	877.	0.439	10.32	1.911
BI-212	3239.65	1620.42	5.	15.	0.008	110.81	1.262s
BI-214	3528.41	1764.83	3.	55.	0.027	39.39	2.171s

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	MDA Value pCi/gm	COMMENTS
BE-7		6.7428E-02					
			477.56	6.743E-02	%(	2.408E-01 7.14E-02	G
K-40		9.0889E+00					
			1460.75	9.089E+00	(P	3.042E-01 3.19E-01	G
MN-54		1.5067E-02					
			834.81	1.507E-02	%(P	2.523E-02 7.79E-03	G
CO-57		-7.8983E-03					
			122.07	-7.898E-03	%(P	4.106E-02 1.23E-02	G K
			136.43	-1.095E-02	&	3.128E-01 9.30E-02	G
CO-60		5.5932E-03					
			1332.51	5.593E-03	&(P	2.895E-02 8.12E-03	G K
			1173.23	1.545E-03	& P	3.276E-02 9.15E-03	G K
Sr-85		-1.3702E-02					
			514.00	-1.370E-02	%(	3.804E-02 1.14E-02	G
Kr-85		-3.0390E+02					
			513.99	-3.039E+02	%(	8.434E+02 2.53E+02	G
Y-88		-3.0638E-03					
			1836.01	-3.064E-03	%(P	2.820E-02 7.69E-03	G K
			898.02	-5.345E-03	& P	3.066E-02 8.79E-03	G
NB-94		-1.2751E-03					
			871.10	-1.275E-03	&(	2.377E-02 6.66E-03	G K
			702.50	8.455E-03	%	2.329E-02 6.94E-03	G K
Ag-108M		-8.0218E-03					
			722.95	-8.022E-03	%(	3.160E-02 9.31E-03	G K
			614.37	-6.710E-03	% P	3.465E-02 1.02E-02	G
			433.93	-8.157E-03	&	2.683E-02 8.00E-03	G
CD-109		-2.5237E-02					
			88.04	-2.524E-02	&(	1.585E+00 4.72E-01	G
SN-113		8.3425E-03					
			391.71	8.342E-03	&(	3.637E-02 1.08E-02	G K
			255.04	-2.769E-01	%	1.260E+00 3.76E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	3.4682E-02						
		427.95	-1.323E-02	&(P	8.269E-02	2.43E-02	G K
		600.77	4.790E-02	& P	1.232E-01	3.69E-02	G
		636.15	4.892E-02	% P	2.153E-01	6.29E-02	G
		463.51	1.765E-01	@(P	2.268E-01	7.08E-02	G
		176.29	-1.508E-01	%	3.724E-01	1.12E-01	G
I-131	-4.3237E-04						
		364.48	-4.324E-04	%(P	3.688E-02	1.06E-02	G K
		636.97	1.307E-01	%	4.444E-01	1.31E-01	G
		284.29	7.576E-02	% P	5.703E-01	1.69E-01	G
CS-134	-5.6932E-03						
		604.66	-5.693E-03	%(	2.941E-02	8.64E-03	G K
		795.76	1.448E-02	% P	3.121E-02	9.45E-03	G
		569.29	-7.296E-03	& P	1.798E-01	5.13E-02	G
		801.84	-1.463E-02	% P	2.939E-01	8.12E-02	G
CS-137	7.5317E-03						
		661.62	7.532E-03	%(P	3.327E-02	9.74E-03	G
CE-139	1.0815E-02						
		165.85	1.081E-02	%(	3.571E-02	1.07E-02	G
EU-152	-2.4140E-02						
		121.78	-2.414E-02	%(P	1.194E-01	3.57E-02	G K
		344.30	5.620E-04	% P	9.536E-02	2.78E-02	G
		1408.08	5.083E-02	%	1.052E-01	3.21E-02	G
		964.00	6.733E-02	& P	2.492E-01	7.35E-02	G
		1112.07	9.256E-02	&	1.877E-01	5.72E-02	G
		778.90	1.196E-02	%	1.825E-01	5.16E-02	G
EU-154	-5.6834E-03						
		123.10	-5.683E-03	%(	7.066E-02	2.10E-02	G K
		1274.80	-1.136E-02	%	8.013E-02	2.27E-02	G
		723.30	-3.810E-02	%	1.441E-01	4.25E-02	G
		1004.80	-1.412E-02	%	1.549E-01	4.38E-02	G
EU-155	1.2397E-01						
		86.45	1.240E-01	%(	1.805E-01	5.52E-02	G K
		105.31	4.449E-02	%	1.781E-01	5.34E-02	G
HG-203	-4.4731E-04						
		279.17	-4.473E-04	%(P	3.491E-02	1.03E-02	G K
		72.87	-5.513E-01	% P	1.966E+00	5.91E-01	G
		70.83	9.835E-01	&	2.935E+00	8.84E-01	G
		82.50	3.542E-01	%	3.100E+00	9.25E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	1.9282E-01						
		583.14	1.928E-01	(P	3.065E-02	1.56E-02	G
		510.72	2.514E-01	+ P	1.387E-01	5.41E-02	G
PB-212	5.5017E-01						
		238.63	5.502E-01	(P	6.403E-02	2.83E-02	G K
							Energy duplication
		77.11	5.266E-01	} P	2.952E-01	7.67E-02	G
		74.81	8.766E-01	+ P	6.129E-01	1.97E-01	G
PB-214	3.9723E-01						
		351.99	3.780E-01	(P	6.555E-02	2.93E-02	G K
		295.22	4.098E-01	(P	1.276E-01	5.06E-02	G
							Energy duplication
		77.11	0.000E+00	} P	7.237E-01	0.00E+00	G
		241.92	4.607E-01	(	4.135E-01	1.29E-01	G
BI-212	3.5068E-01						
		727.17	3.507E-01	(P	1.906E-01	7.31E-02	G K
		1620.56	6.604E-01	+ P	5.650E-01	2.45E-01	G
		785.42	6.946E-01	%	1.103E+00	3.43E-01	G
BI-214	3.7983E-01						
		609.32	3.626E-01	(P	6.843E-02	3.39E-02	G K
		1764.51	4.397E-01	@(P	8.949E-02	6.12E-02	G
		1120.28	3.693E-01	*(P	2.299E-01	9.59E-02	G
RA-224	1.0323E+00						
		241.00	1.032E+00	(	7.930E-01	2.50E-01	G
RA-226	7.9287E-01						
		185.99	7.929E-01	*(P	9.299E-01	2.85E-01	G
AC-228	5.0423E-01						
		911.07	5.143E-01	(P	8.928E-02	4.67E-02	G K
		968.90	4.706E-01	(P	1.279E-01	5.85E-02	G
		338.40	5.290E-01	*(P	2.093E-01	8.35E-02	G
TH-227	8.5386E-03						
		236.00	8.539E-03	&(	2.282E-01	6.73E-02	G K
		256.25	-8.605E-03	& P	3.454E-01	1.01E-01	G
PA-234	4.2445E-02						
		98.44	4.245E-02	&(P	1.790E-01	5.37E-02	G K
		946.00	1.139E-03	& P	1.374E-01	3.84E-02	G
		131.28	-3.897E-02	% P	1.745E-01	5.23E-02	G
		94.67	-1.233E-02	& P	2.704E-01	8.02E-02	G
		883.24	6.763E-02	%	1.898E-01	5.63E-02	G
		926.70	3.310E-02	&	2.085E-01	5.94E-02	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26-7.618E-03 & P 2.654E-01 7.57E-02 G

TH-234       7.3047E-01
                           63.29 7.305E-01 %(P 5.073E+00 1.51E+00 G K
                           92.80 1.198E+00 % P 1.683E+00 5.12E-01 G
                           92.38 1.299E+00 % P 2.000E+00 6.07E-01 G

AM-241      -1.6008E-03
                           59.54-1.601E-03 &(P 9.157E-01 2.71E-01 G
   ( - This peak used in the nuclide activity average.

   * - Peak is too wide, but only one peak in library.
   ! - Peak is part of a multiplet and this area went
       negative during deconvolution.
   ? - Peak is too narrow.
   @ - Peak is too wide at FW25M, but ok at FWHM.
   % - Peak fails sensitivity test.
   $ - Peak identified, but first peak of this nuclide
       failed one or more qualification tests.
   + - Peak activity higher than counting uncertainty range.
   - - Peak activity lower than counting uncertainty range.
   = - Peak outside analysis energy range.
   & - Calculated peak centroid is not close enough to the
       library energy centroid for positive identification.
   P - Peakbackground subtraction
   } - Peak is too close to another for the activity
       to be found directly.

   Nuclide Codes:                      Peak Codes:
   T - Thermal Neutron Activation      G - Gamma Ray
   F - Fast Neutron Activation         X - X-Ray
   I - Fission Product                 P - Positron Decay
   N - Naturally Occurring Isotope     S - Single-Escape
   P - Photon Reaction                 D - Double-Escape
   C - Charged Particle Reaction       K - Key Line
   M - No MDA Calculation              A - Not in Average
   R - Coincidence Corrected           C - Coincidence Peak
   H - Halflife limit exceeded

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
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***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	6.4194E-02	6.7428E-02	2.1431E-01	2.1434E-01	2.293E-01
K-40		9.0889E+00	9.0889E+00	9.5757E-01	1.0933E+00	
MN-54	#A	1.4940E-02	1.5067E-02	2.3361E-02	2.3378E-02	2.502E-02
CO-57	#B	-7.8219E-03	-7.8983E-03	3.8224E-02	3.8226E-02	4.066E-02
CO-60	#B	5.5856E-03	5.5932E-03	2.4347E-02	2.4349E-02	2.891E-02

Sr-85	#A	-1.3158E-02	-1.3702E-02	3.4293E-02	3.4303E-02	3.653E-02
Kr-85	#A	-3.0389E+02	-3.0390E+02	7.6033E+02	7.6053E+02	8.433E+02
Y-88	#B	-2.9893E-03	-3.0638E-03	2.4402E-02	2.4403E-02	2.751E-02
NB-94	#B	-1.2751E-03	-1.2751E-03	1.9992E-02	1.9992E-02	2.377E-02
Ag-108M	#B	-8.0213E-03	-8.0218E-03	2.7930E-02	2.7934E-02	3.159E-02
CD-109	#A	-2.5091E-02	-2.5237E-02	1.4149E+00	1.4149E+00	1.576E+00
SN-113	#B	8.1544E-03	8.3425E-03	3.2284E-02	3.2287E-02	3.555E-02
SB-125	#B	3.4592E-02	3.4682E-02	4.1752E-02	4.1801E-02	8.247E-02
I-131	#B	-3.1193E-04	-4.3237E-04	2.3296E+00	2.3296E+00	2.661E-02
CS-134	#B	-5.6734E-03	-5.6932E-03	2.5913E-02	2.5915E-02	2.931E-02
CS-137	#A	7.5299E-03	7.5317E-03	2.9235E-02	2.9238E-02	3.326E-02
CE-139	#A	1.0610E-02	1.0815E-02	3.2204E-02	3.2211E-02	3.503E-02
EU-152	#B	-2.4127E-02	-2.4140E-02	1.1570E-01	1.1571E-01	1.194E-01
EU-154	#B	-5.6786E-03	-5.6834E-03	6.2909E-02	6.2910E-02	7.060E-02
EU-155	#B	1.2379E-01	1.2397E-01	1.6573E-01	1.6587E-01	1.803E-01
HG-203	#B	-4.2281E-04	-4.4731E-04	3.3039E-02	3.3039E-02	3.300E-02
TL-208		1.9282E-01	1.9282E-01	4.6826E-02	4.8145E-02	
PB-212		5.5017E-01	5.5017E-01	8.4858E-02	9.0671E-02	
PB-214		3.9723E-01	3.9723E-01	9.2399E-02	9.5234E-02	
BI-212		3.5068E-01	3.5068E-01	2.1922E-01	2.2016E-01	
BI-214		3.7983E-01	3.7983E-01	1.0639E-01	1.0865E-01	
RA-224		1.0323E+00	1.0323E+00	7.5059E-01	7.5298E-01	7.930E-01
RA-226	#A	7.9287E-01	7.9287E-01	8.5624E-01	8.5748E-01	9.299E-01
AC-228		5.0423E-01	5.0423E-01	1.1119E-01	1.1498E-01	
TH-227	#B	8.5386E-03	8.5386E-03	2.0204E-01	2.0204E-01	2.282E-01
PA-234	#B	4.2445E-02	4.2445E-02	1.6112E-01	1.6113E-01	1.790E-01
TH-234	#B	7.3047E-01	7.3047E-01	4.5292E+00	4.5294E+00	5.073E+00
AM-241	#A	-1.6008E-03	-1.6008E-03	3.2344E-01	3.2344E-01	9.157E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (1120.0 to 2000.7 keV) 1.2496075E+01 pCi/gm
Total Decayed Activity (1120.0 to 2000.7 keV) 1.2496075E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JPK

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 103F_13SEPT2006_1007.An1

Sample description
FSS-OOL-05-10-005-F-RC

Spectrum Filename: C:\GammaVision\Spectra\103F_13SEPT2006_1007.An1

Acquisition information
Start time: 13-Sep-2006 10:07:42
Live time: 2000
Real time: 2002
Dead time: 0.11 %
Detector ID: 4

Detector system
Det 103 - DSPE-471

Calibration
Filename: D3_1LSa.Clb
Detector_103 1.0 Liter Sand Geometry

Energy Calibration
Created: 08-Aug-2005 11:09:41
Zero offset: 0.409 keV
Gain: 0.500 keV/channel
Quadratic: 1.092E-08 keV/channel^2

Efficiency Calibration
Created: 08-Aug-2005 11:11:25
Type: Polynomial
Uncertainty: 0.993 %
Coefficients: -0.264059 -5.138468 0.638383
-0.089199 0.005011 -0.000129

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.41keV)
Stop channel: 4000 (2000.67keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 1.8910E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.8910E+03) =
5.2882E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	09-Sep-2006 08:47:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	103_150K_05AUG05.Pbc 08-Aug-2005 12:54:15
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 15 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.0949

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
74.73	135.	18.75	0.99	9.100E-03	74.81	9.600	1.087E+00	PB212
77.31	215.	13.42	0.99	1.029E-02	77.11	10.700	1.398E+00	PB214
					77.11	17.500	8.545E-01	PB212
93.17	95.	37.95	1.50	1.631E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
93.18	96.	37.12	1.50	1.645E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
186.32	153.	24.83	1.19	2.566E-02	185.99	3.280	1.187E+00	RA226
209.30	128.	29.18	0.73	2.471E-02				
238.72	930.	3.94	1.09	2.320E-02	238.63	43.100	6.564E-01	PB212
241.54	124.	23.64	1.09	2.304E-02	241.00	3.900	9.862E-01	RA224
					241.92	7.470	5.160E-01	PB214
269.81	84.	32.66	1.24	2.153E-02				
277.62	77.	36.76	1.38	2.113E-02				
295.28	187.	13.80	1.24	2.025E-02	295.22	19.200	3.359E-01	PB214
300.26	56.	40.88	0.74	2.000E-02				
328.19	63.	38.35	1.58	1.873E-02				
338.25	205.	12.73	1.11	1.831E-02	338.40	12.010	6.617E-01	AC228
351.90	397.	8.48	1.12	1.776E-02	351.99	37.100	4.251E-01	PB214
409.96	37.	40.18	1.68	1.573E-02				
463.18	71.	35.15	1.22	1.425E-02				
463.18	71.	35.15	1.22	1.425E-02	463.51	10.000	3.507E-01	SB125
510.33	179.	14.99	1.83	1.318E-02	510.72	22.500	3.663E-01	TL208
583.13	391.	7.04	1.24	1.184E-02	583.14	86.000	2.710E-01	TL208
609.34	314.	9.76	1.45	1.144E-02	609.32	46.090	4.162E-01	BI214
727.17	83.	16.06	1.39	9.969E-03	727.17	11.800	5.029E-01	BI212
730.91	24.	41.26	1.39	9.926E-03				

767.83	70.	29.44	1.50	9.558E-03				
795.28	37.	30.29	1.57	9.306E-03				
795.28	37.	30.29	1.57	9.306E-03	795.76	85.400	3.351E-02	CS134
911.31	248.	9.27	1.51	8.400E-03	911.07	29.000	7.175E-01	AC228
964.58	40.	36.40	1.54	8.056E-03	964.00	14.580	PBC<MDA	EU152
968.71	198.	13.56	1.50	8.027E-03	968.90	17.460	1.010E+00	AC228
1120.34	85.	22.99	1.51	7.211E-03	1120.28	15.040	5.449E-01	BI214
1460.88	1378.	2.73	1.71	5.932E-03	1460.75	10.700	1.530E+01	K40
1764.41	74.	11.40	2.15	5.142E-03	1764.51	15.920	6.437E-01	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
417.77	209.30	502.	128.	0.064	87.53	0.732	AC-228	
538.77	269.81	277.	84.	0.042	97.98	1.241	AC-228	
554.38	277.62	258.	101.	0.051	73.64	1.375	NP-239	s
599.67	300.26	211.	56.	0.028	122.65	0.744	PB-212	s
655.52	328.19	217.	63.	0.032	115.06	1.584	AC-228	s
819.04	409.96	92.	37.	0.019	120.54	1.681	AC-228	s
1460.89	730.84	38.	24.	0.012	123.77	1.394	J-134	D
1534.71	767.83	106.	70.	0.035	88.31	1.501	BI-214	M

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.
M - Peak is close to a library peak.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-212	148.79	74.81	305.	137.	0.068	58.46	0.993D
PB-212	153.39	77.11	334.	147.	0.074	49.26	0.995A
RA-226	371.47	186.15	671.	135.	0.068	77.49	1.500
PB-212	476.57	238.71	674.	831.	0.415	18.03	1.091
RA-224	482.46	241.65	711.	110.	0.055	106.41	1.500
PB-214	589.72	295.28	221.	183.	0.091	41.40	1.236
AC-228	675.65	338.25	198.	204.	0.102	38.19	1.114
PB-214	702.94	351.90	260.	392.	0.196	25.44	1.122
SB-125	925.42	463.15	154.	62.	0.031	91.67	1.500
TL-208	1019.78	510.33	185.	152.	0.076	44.98	1.835s
TL-208	1165.36	583.13	119.	386.	0.193	21.13	1.239
BI-214	1217.78	609.34	166.	307.	0.154	29.27	1.446
BI-212	1453.41	727.17	46.	83.	0.042	47.45	1.392D
CS-134	1589.41	795.18	52.	42.	0.021	86.34	1.500
AC-228	1821.64	911.31	83.	245.	0.122	27.80	1.511
EU-152	1928.18	964.58	88.	40.	0.020	109.20	1.538s
AC-228	1936.44	968.71	125.	198.	0.099	40.68	1.498
BI-214	2239.66	1120.34	88.	83.	0.041	68.98	1.513s
K-40	2920.62	1460.88	33.	1359.	0.679	8.20	1.709
BI-214	3527.57	1764.41	3.	74.	0.037	34.19	2.150

s - Peak fails shape tests.
D - Peak area deconvoluted.

A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	Peak MDA Value pCi/gm	COMMENTS
BE-7		-6.5369E-03					
			477.56	-6.537E-03	%(	2.938E-01 8.50E-02	G
K-40		1.5299E+01					
			1460.75	1.530E+01	(P	3.325E-01 4.24E-01	G
MN-54		1.4241E-03					
			834.81	1.424E-03	%(P	3.893E-02 1.12E-02	G
CO-57		1.8847E-03					
			122.07	1.885E-03	%(P	4.787E-02 1.43E-02	G K
			136.43	-5.157E-02	%	3.183E-01 9.51E-02	G
CO-60		-2.9838E-03					
			1332.51	-2.984E-03	%(P	3.934E-02 1.07E-02	G K
			1173.23	-1.125E-02	& P	5.121E-02 1.49E-02	G K
Sr-85		-2.2394E-02					
			514.00	-2.239E-02	%(	4.284E-02 1.30E-02	G
Kr-85		-4.9515E+02					
			513.99	-4.951E+02	%(	9.471E+02 2.88E+02	G
Y-88		-3.0139E-04					
			1836.01	-3.014E-04	%(P	2.624E-02 6.75E-03	G K
			898.02	4.350E-03	& P	3.456E-02 9.91E-03	G
NB-94		8.9589E-03					
			871.10	8.959E-03	&(	2.587E-02 7.67E-03	G K
			702.50	-1.761E-03	%	3.319E-02 9.56E-03	G K
Ag-108M		-1.2063E-02					
			722.95	-1.206E-02	%(	4.266E-02 1.27E-02	G K
			614.37	-1.724E-02	% P	3.825E-02 1.16E-02	G
			433.93	8.469E-03	&	3.048E-02 9.07E-03	G
CD-109		1.2461E+00					
			88.04	1.246E+00	%(	1.745E+00 5.34E-01	G
SN-113		1.5543E-02					
			391.71	1.554E-02	&(	3.872E-02 1.17E-02	G K
			255.04	3.974E-01	%	1.463E+00 4.38E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	6.6378E-02						
		427.95	-1.586E-02	%(P	9.908E-02	2.92E-02	G K
		600.77	-2.075E-03	% P	1.532E-01	4.38E-02	G
		636.15	5.175E-03	% P	2.723E-01	7.80E-02	G
		463.51	3.098E-01	(P	3.048E-01	9.66E-02	G
		176.29	9.706E-02	%	5.610E-01	1.68E-01	G
I-131	2.3667E-04						
		364.48	2.367E-04	%(P	5.270E-02	1.54E-02	G K
		636.97	-3.098E-02	%	6.268E-01	1.81E-01	G
		284.29	8.969E-02	% P	6.895E-01	2.04E-01	G
CS-134	1.7780E-02						
		604.66	2.822E-04	&(	3.607E-02	1.04E-02	G K
		795.76	3.778E-02	(P	3.277E-02	1.09E-02	G
		569.29	-5.851E-03	& P	1.992E-01	5.69E-02	G
		801.84	-2.353E-02	% P	4.199E-01	1.19E-01	G
CS-137	1.1140E-02						
		661.62	1.114E-02	%(P	4.264E-02	1.26E-02	G
CE-139	1.0725E-02						
		165.85	1.073E-02	%(	4.283E-02	1.29E-02	G
EU-152	8.6696E-02						
		121.78	9.215E-03	%(P	1.068E-01	3.17E-02	G K
		344.30	1.010E-02	% P	1.052E-01	3.10E-02	G
		1408.08	4.814E-02	%	1.402E-01	4.14E-02	G
		964.00	2.421E-01	(P	2.827E-01	8.93E-02	G
		1112.07	-3.309E-02	%	2.647E-01	7.60E-02	G
		778.90	4.676E-02	%	2.457E-01	7.17E-02	G
EU-154	-2.2342E-02						
		123.10	-2.234E-02	%(	1.057E-01	3.17E-02	G K
		1274.80	-3.594E-04	%	1.142E-01	3.21E-02	G
		723.30	-5.919E-02	%	1.967E-01	5.86E-02	G
		1004.80	-5.768E-03	%	1.823E-01	5.13E-02	G
EU-155	3.2996E-03						
		86.45	3.300E-03	%(	2.307E-01	6.88E-02	G K
		105.31	4.443E-02	%	2.182E-01	6.54E-02	G
HG-203	-1.3652E-02						
		279.17	-1.365E-02	&(P	3.832E-02	1.15E-02	G K
		72.87	-5.875E-01	% P	2.266E+00	6.82E-01	G
		70.83	1.920E-01	%	4.740E+00	1.42E+00	G
		82.50	-1.761E-01	&	3.735E+00	1.11E+00	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	2.7100E-01						
		583.14	2.710E-01	(P	3.752E-02	1.93E-02	G
		510.72	3.663E-01	+ P	1.594E-01	6.46E-02	G
PB-212	5.9367E-01						
		238.63	5.937E-01	(P	8.843E-02	3.62E-02	G K
							Energy duplication
		77.11	5.937E-01	} P	3.550E-01	9.75E-02	G
		74.81	1.126E+00	+ P	6.917E-01	2.24E-01	G
PB-214	4.2506E-01						
		351.99	4.251E-01	(P	8.451E-02	3.66E-02	G K
		295.22	3.359E-01	- P	1.324E-01	4.74E-02	G
							Energy duplication
		77.11	4.225E-01	} P	8.523E-01	2.12E-01	G
		241.92	1.386E-01	%	5.580E-01	1.68E-01	G
BI-212	5.0456E-01						
		727.17	5.046E-01	(P	2.085E-01	8.03E-02	G K
		1620.56	2.633E-01	% P	6.688E-01	1.98E-01	G
		785.42	6.918E-01	%	1.481E+00	4.49E-01	G
BI-214	4.1615E-01						
		609.32	4.162E-01	(P	8.505E-02	4.15E-02	G K
		1764.51	6.437E-01	+ P	9.725E-02	7.66E-02	G
		1120.28	5.449E-01	+ P	3.063E-01	1.28E-01	G
RA-224	8.7631E-01						
		241.00	8.763E-01	(	1.008E+00	3.11E-01	G
RA-226	1.1475E+00						
		185.99	1.147E+00	(P	1.048E+00	3.25E-01	G
AC-228	7.0118E-01						
		911.07	7.175E-01	(P	1.327E-01	6.74E-02	G K
		968.90	1.010E+00	+ P	2.795E-01	1.37E-01	G
		338.40	6.617E-01	(P	2.223E-01	8.47E-02	G
TH-227	-1.7653E-01						
		236.00	-1.765E-01	%(	3.759E-01	1.14E-01	G K
		256.25	9.819E-02	% P	4.125E-01	1.23E-01	G
PA-234	-1.1230E-02						
		98.44	-1.123E-02	%(P	1.764E-01	5.24E-02	G K
		946.00	6.580E-02	& P	1.412E-01	4.28E-02	G
		131.28	-2.128E-02	& P	2.060E-01	6.16E-02	G
		94.67	-1.107E-01	& P	3.964E-01	1.19E-01	G
		883.24	2.966E-02	%	2.803E-01	8.07E-02	G
		926.70	-8.417E-03	&	3.868E-01	1.11E-01	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26-1.268E-02 & P 2.951E-01 8.43E-02 G

TH-234       2.5384E+00
                           63.29 2.538E+00 %(P 5.849E+00 1.77E+00 G K
                           92.80 1.393E+00 % P 2.010E+00 6.12E-01 G
                           92.38 1.615E+00 % P 2.391E+00 7.27E-01 G

AM-241       7.5774E-03
                           59.54 7.577E-03 &(P 1.090E+00 3.24E-01 G
   ( - This peak used in the nuclide activity average.

   * - Peak is too wide, but only one peak in library.
   ! - Peak is part of a multiplet and this area went
       negative during deconvolution.
   ? - Peak is too narrow.
   @ - Peak is too wide at FW25M, but ok at FWHM.
   % - Peak fails sensitivity test.
   $ - Peak identified, but first peak of this nuclide
       failed one or more qualification tests.
   + - Peak activity higher than counting uncertainty range.
   - - Peak activity lower than counting uncertainty range.
   = - Peak outside analysis energy range.
   & - Calculated peak centroid is not close enough to the
       library energy centroid for positive identification.
   P - Peakbackground subtraction
   } - Peak is too close to another for the activity
       to be found directly.

   Nuclide Codes:                      Peak Codes:
   T - Thermal Neutron Activation      G - Gamma Ray
   F - Fast Neutron Activation         X - X-Ray
   I - Fission Product                 P - Positron Decay
   N - Naturally Occurring Isotope     S - Single-Escape
   P - Photon Reaction                 D - Double-Escape
   C - Charged Particle Reaction       K - Key Line
   M - No MDA Calculation              A - Not in Average
   R - Coincidence Corrected           C - Coincidence Peak
   H - Halflife limit exceeded

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
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***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	-6.2016E-03	-6.5369E-03	2.5510E-01	2.5510E-01	2.787E-01
K-40		1.5299E+01	1.5299E+01	1.2719E+00	1.5513E+00	
MN-54	#A	1.4113E-03	1.4241E-03	3.3579E-02	3.3579E-02	3.858E-02
CO-57	#B	1.8651E-03	1.8847E-03	4.2761E-02	4.2761E-02	4.737E-02
CO-60	#B	-2.9794E-03	-2.9838E-03	1.6993E-01	1.6993E-01	3.928E-02

Sr-85	#A	-2.1444E-02	-2.2394E-02	3.9097E-02	3.9118E-02	4.102E-02
Kr-85	#A	-4.9513E+02	-4.9515E+02	8.6431E+02	8.6479E+02	9.471E+02
Y-88	#B	-2.9355E-04	-3.0139E-04	3.8384E-02	3.8384E-02	2.556E-02
NB-94	#B	8.9589E-03	8.9589E-03	2.3010E-02	2.3016E-02	2.587E-02
Ag-108M	#B	-1.2062E-02	-1.2063E-02	3.8037E-02	3.8044E-02	4.266E-02
CD-109	#A	1.2384E+00	1.2461E+00	1.6025E+00	1.6040E+00	1.734E+00
SN-113	#B	1.5168E-02	1.5543E-02	3.4953E-02	3.4964E-02	3.778E-02
SB-125	#B	6.6194E-02	6.6378E-02	6.2107E-02	6.2226E-02	9.881E-02
I-131	#B	1.6683E-04	2.3667E-04	4.6179E-02	4.6179E-02	3.715E-02
CS-134	#B	1.7714E-02	1.7780E-02	1.5384E-02	1.5419E-02	3.594E-02
CS-137	#A	1.1137E-02	1.1140E-02	3.7832E-02	3.7837E-02	4.263E-02
CE-139	#A	1.0508E-02	1.0725E-02	3.8575E-02	3.8580E-02	4.197E-02
EU-152	#B	8.6643E-02	8.6696E-02	9.5968E-02	9.6089E-02	1.067E-01
EU-154	#B	-2.2322E-02	-2.2342E-02	9.5216E-02	9.5224E-02	1.056E-01
EU-155	#B	3.2945E-03	3.2996E-03	2.0629E-01	2.0629E-01	2.303E-01
HG-203	#B	-1.2853E-02	-1.3652E-02	3.4678E-02	3.4687E-02	3.608E-02
TL-208		2.7100E-01	2.7100E-01	5.7894E-02	5.9993E-02	
PB-212		5.9367E-01	5.9367E-01	1.0859E-01	1.1393E-01	
PB-214		4.2506E-01	4.2506E-01	1.0970E-01	1.1244E-01	
BI-212		5.0456E-01	5.0456E-01	2.4084E-01	2.4261E-01	
BI-214		4.1615E-01	4.1615E-01	1.2437E-01	1.2670E-01	
RA-224	#A	8.7631E-01	8.7631E-01	9.3249E-01	9.3387E-01	1.008E+00
RA-226	#	1.1475E+00	1.1475E+00	9.7442E-01	9.7670E-01	1.048E+00
AC-228		7.0118E-01	7.0118E-01	1.6697E-01	1.7186E-01	
TH-227	#B	-1.7653E-01	-1.7653E-01	3.4190E-01	3.4205E-01	3.759E-01
PA-234	#B	-1.1230E-02	-1.1230E-02	2.0711E-01	2.0711E-01	1.764E-01
TH-234	#B	2.5384E+00	2.5384E+00	5.3005E+00	5.3024E+00	5.849E+00
AM-241	#A	7.5773E-03	7.5774E-03	9.7081E-01	9.7081E-01	1.090E+00

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (767.5 to 2000.7 keV) 1.8210955E+01 pCi/gm
Total Decayed Activity (767.5 to 2000.7 keV) 1.8210955E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JPK

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 107F_9SEP2006_0956.An1

Sample description
FSS-OOL-05-10-002-F-A

Spectrum Filename: C:\GammaVision\Spectra\107F_9SEP2006_0956.An1

Acquisition information
Start time: 09-Sep-2006 09:56:46
Live time: 2000
Real time: 2001
Dead time: 0.06 %
Detector ID: 2

Detector system
Det 107- DSPE- 634

Calibration
Filename: D7_1LSa.Clb
Detector 107 Calibration for 1 Liter Sand Marinelli

Energy Calibration
Created: 29-Oct-2004 06:48:53
Zero offset: 0.157 keV
Gain: 0.500 keV/channel
Quadratic: -1.676E-08 keV/channel^2

Efficiency Calibration
Created: 29-Oct-2004 06:51:32
Type: Polynomial
Uncertainty: 1.174 %
Coefficients: -0.279532 -4.778179 0.614896
-0.087174 0.005356 -0.000131

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.16keV)
Stop channel: 4000 (2000.15keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 1.4430E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.4430E+03) =
6.9300E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	09-Sep-2006 08:10:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	107_150K_28APR05.Pbc 01-May-2005 05:30:33
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 11 cutoff 20.00000 %
Energy Calibration
Normalized diff: 1.0000

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
76.04	443.	11.74	2.05	2.909E-02	74.81	9.600	1.504E+00	PB212
					77.11	10.700	1.298E+00	PB214
					77.11	17.500	8.020E-01	PB212
93.09	74.	39.20	1.50	3.438E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
					94.67	15.500	PBC<MDA	PA234
93.14	95.	33.32	1.50	3.477E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
					94.67	15.500	1.657E-01	PA234
93.26	87.	38.11	1.50	3.429E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
					94.67	15.500	PBC<MDA	PA234
186.37	210.	18.02	2.11	3.607E-02	185.99	3.280	1.662E+00	RA226
239.57	618.	6.07	1.96	3.182E-02	236.00	11.200	1.608E+00	TH227
					238.63	43.100	4.102E-01	PB212
					241.00	3.900	4.663E+00	RA224
295.31	325.	8.07	2.52	2.767E-02	295.22	19.200	5.643E-01	PB214
338.38	43.	41.66	1.50	2.500E-02	338.40	12.010	PBC<MDA	AC228
352.00	539.	5.73	2.09	2.426E-02	351.99	37.100	5.558E-01	PB214
510.66	25.	24.56	1.50	1.808E-02	510.72	22.500	PBC<MDA	TL208
583.53	154.	12.66	2.30	1.628E-02	583.14	86.000	9.964E-02	TL208
609.45	416.	6.03	2.20	1.574E-02	609.32	46.090	5.308E-01	BI214
727.12	34.	34.17	2.08	1.374E-02	723.30	19.700	PBC<MDA	EU154
					727.17	11.800	1.970E-01	BI212
911.61	66.	18.75	1.76	1.161E-02	911.07	29.000	1.836E-01	AC228
968.65	30.	34.03	1.80	1.109E-02	968.90	17.460	PBC<MDA	AC228

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
1120.42	114.	13.60	2.90	9.970E-03	1120.28	15.040	7.090E-01	BI214
1460.91	431.	4.87	2.82	8.190E-03	1460.75	10.700	4.557E+00	K40
1764.47	69.	11.95	1.10	7.084E-03	1764.51	15.920	5.739E-01	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
151.74	76.04	1042.	132.	0.066	106.99	2.054	BI-207	s
478.78	239.57	721.	151.	0.076	79.10	1.962	PB-212	s
590.24	295.31	367.	92.	0.046	93.26	2.518	PB-214	s
703.61	352.00	570.	99.	0.050	106.66	2.090	PB-214	s
1166.63	583.53	164.	52.	0.026	112.55	2.296	TL-208	s

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-212	149.80	75.07	865.	130.	0.065	96.49	1.500s
PB-214	153.89	77.11	770.	173.	0.086	69.95	1.500D
PB-212	153.89	77.11	766.	177.	0.089	69.95	1.500D
TH-234	186.18	93.26	620.	87.	0.044	114.33	1.500s
PA-234	185.94	93.14	457.	95.	0.048	99.96	1.500s
RA-226	371.23	185.79	333.	175.	0.087	57.05	2.062s
TH-227	477.05	238.71	367.	261.	0.131	36.19	1.500s
PB-212	477.01	238.69	569.	245.	0.122	42.61	1.500s
RA-224	477.13	238.75	489.	204.	0.102	49.86	1.500s
PB-214	590.44	295.41	189.	228.	0.114	31.65	1.500s
PB-214	703.59	351.99	130.	435.	0.218	17.91	1.500D
TL-208	1165.70	583.06	64.	97.	0.049	43.85	1.540s
BI-214	1218.47	609.45	67.	411.	0.206	18.09	2.200s
BI-212	1453.81	727.12	41.	34.	0.017	102.50	2.083s
AC-228	1822.77	911.61	56.	66.	0.033	56.24	1.761s
AC-228	1936.86	968.65	48.	30.	0.015	102.09	1.799s
BI-214	2240.42	1120.42	34.	114.	0.057	40.80	2.902s
K-40	2921.42	1460.91	8.	426.	0.213	14.62	2.821s
BI-214	3528.60	1764.47	1.	69.	0.035	35.86	1.100s

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	MDA Value pCi/gm	COMMENTS
BE-7		6.0475E-02					
			477.56	6.047E-02	%(	1.670E-01 4.97E-02	G
K-40		4.5569E+00					
			1460.75	4.557E+00	*(P	1.656E-01 2.25E-01	G
MN-54		1.1490E-03					
			834.81	1.149E-03	%(P	1.789E-02 4.87E-03	G
CO-57		-2.2713E-04					
			122.07	-2.271E-04	%(P	3.097E-02 9.16E-03	G K
			136.43	-6.916E-02	% P	2.524E-01 7.58E-02	G
CO-60		-9.8686E-05					
			1332.51	-9.869E-05	&(P	2.653E-02 6.86E-03	G K
			1173.23	-4.902E-04	% P	3.111E-02 8.38E-03	G K
Sr-85		-9.0346E-03					
			514.00	-9.035E-03	&(	2.808E-02 8.38E-03	G
Kr-85		-2.4455E+02					
			513.99	-2.445E+02	&(P	6.553E+02 1.93E+02	G
Y-88		-1.1174E-03					
			1836.01	-1.117E-03	&(P	3.174E-02 8.32E-03	G K
			898.02	-1.140E-03	% P	2.599E-02 7.04E-03	G
NB-94		-1.5613E-03					
			871.10	-1.561E-03	&(P	2.326E-02 6.49E-03	G K
			702.50	-4.839E-03	& P	2.472E-02 7.14E-03	G K
Ag-108M		-8.6994E-04					
			722.95	-8.699E-04	&(	4.394E-02 1.27E-02	G K
			614.37	-2.145E-02	%	3.642E-02 1.12E-02	G
			433.93	1.394E-03	& P	2.073E-02 5.90E-03	G
CD-109		4.5222E-01					
			88.04	4.522E-01	%(P	8.774E-01 2.66E-01	G
SN-113		-1.8829E-03					
			391.71	-1.883E-03	&(P	3.554E-02 1.02E-02	G K
			255.04	-3.510E-01	%	1.122E+00 3.36E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	4.5226E-03						
		427.95	4.523E-03	%(P	5.739E-02	1.63E-02	G K
		600.77	2.016E-02	% P	1.098E-01	3.15E-02	G
		636.15	-1.776E-02	% P	1.789E-01	5.02E-02	G
		463.51	8.231E-02	% P	1.976E-01	5.89E-02	G
		176.29	-6.317E-03	& P	3.714E-01	1.09E-01	G
I-131	2.6194E-03						
		364.48	2.619E-03	%(	2.455E-02	7.14E-03	G K
		636.97	-2.311E-03	%	2.617E-01	7.25E-02	G
		284.29	-7.849E-02	&	3.751E-01	1.11E-01	G
CS-134	-2.9913E-03						
		604.66	-2.991E-03	&(P	7.292E-02	2.17E-02	G K
		795.76	3.261E-03	% P	2.268E-02	6.37E-03	G
		569.29	-1.487E-02	%	1.291E-01	3.69E-02	G
		801.84	-4.165E-02	% P	2.535E-01	7.21E-02	G
CS-137	4.0183E-03						
		661.62	4.018E-03	&(P	2.867E-02	8.15E-03	G
CE-139	5.4602E-03						
		165.85	5.460E-03	%(P	2.971E-02	8.86E-03	G
EU-152	1.6822E-03						
		121.78	1.682E-03	%(P	9.419E-02	2.79E-02	G K
		344.30	-1.703E-02	% P	8.293E-02	2.44E-02	G
		1408.08	2.266E-02	& P	1.409E-01	3.97E-02	G
		964.00	3.864E-02	& P	2.185E-01	6.33E-02	G
		1112.07	-7.177E-03	% P	1.713E-01	4.61E-02	G
		778.90	-2.836E-03	% P	2.392E-01	6.78E-02	G
EU-154	6.5640E-04						
		123.10	6.564E-04	%(P	5.990E-02	1.77E-02	G K
		1274.80	-1.213E-02	% P	8.308E-02	2.34E-02	G
		723.30	8.329E-02	& P	1.184E-01	3.71E-02	G
		1004.80	-2.194E-03	& P	1.445E-01	3.97E-02	G
EU-155	5.3248E-02						
		86.45	5.325E-02	&(	1.052E-01	3.20E-02	G K
		105.31	5.122E-04	& P	1.321E-01	3.91E-02	G
HG-203	1.3585E-03						
		279.17	1.358E-03	%(P	2.612E-02	7.62E-03	G K
		72.87	-2.555E-01	% P	7.840E-01	2.36E-01	G
		70.83	-4.832E-01	%	1.354E+00	4.09E-01	G
		82.50	-2.897E-01	%	1.548E+00	4.63E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	6.4909E-02						
		583.14	6.491E-02	*(P	2.675E-02	9.93E-03	G
		510.72	5.866E-02	% P	1.185E-01	3.34E-02	G
PB-212	1.6659E-01						
		238.63	1.666E-01	*(P	7.757E-02	2.52E-02	G K
							Energy duplication
		77.11	3.208E-01	+	2.382E-01	7.48E-02	G
		74.81	4.453E-01	+ P	4.784E-01	1.47E-01	G
PB-214	4.4725E-01						
							Energy duplication
		351.99	4.527E-01	*(P	5.821E-02	2.74E-02	G K
		295.22	4.014E-01	*(P	1.176E-01	4.32E-02	G
							Energy duplication
		77.11	5.106E-01	*(P	3.908E-01	1.22E-01	G
		241.92	1.509E-01	& P	4.709E-01	1.42E-01	G
BI-212	1.9700E-01						
		727.17	1.970E-01	(P	1.877E-01	6.98E-02	G K
		1620.56	-3.057E-02	& P	9.217E-01	2.39E-01	G
		785.42	3.086E-01	% P	1.106E+00	3.21E-01	G
BI-214	5.4189E-01						
		609.32	5.308E-01	*(P	5.263E-02	3.23E-02	G K
		1764.51	5.739E-01	@(P	6.120E-02	6.95E-02	G
		1120.28	7.090E-01	+ P	1.878E-01	9.72E-02	G
RA-224	1.5483E+00						
		241.00	1.548E+00	&(P	8.008E-01	2.60E-01	G
RA-226	1.3840E+00						
		185.99	1.384E+00	*(	6.940E-01	2.63E-01	G
AC-228	1.6977E-01						
		911.07	1.836E-01	*(P	1.043E-01	3.66E-02	G K
		968.90	1.469E-01	*(P	1.685E-01	5.37E-02	G
		338.40	1.344E-01	% P	1.958E-01	6.02E-02	G
TH-227	6.8029E-01						
		236.00	6.803E-01	?(P	2.396E-01	8.22E-02	G K
		256.25	6.183E-02	% P	3.127E-01	9.25E-02	G
PA-234	4.4272E-02						
		98.44	-3.072E-02	&(	1.053E-01	3.16E-02	G K
		946.00	2.685E-02	%	1.102E-01	3.18E-02	G
		131.28	-2.270E-02	%	1.263E-01	3.77E-02	G
		94.67	1.657E-01	&(	1.778E-01	5.52E-02	G
		883.24	0.000E+00	&	2.550E-01	7.20E-02	G
		926.70	6.067E-04	&	2.098E-01	5.76E-02	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26-2.206E-02 %   1.916E-01 5.48E-02 G

TH-234       4.8807E-01
                           63.29 1.981E-01 &(P 1.406E+00 4.17E-01 G K
                           92.80 6.716E-01 % P 1.101E+00 3.33E-01 G
                           92.38 9.281E-01 *(P 1.262E+00 3.86E-01 G

AM-241       6.6699E-05
                           59.54 6.670E-05 %(P 1.440E-01 4.24E-02 G
   ( - This peak used in the nuclide activity average.

   * - Peak is too wide, but only one peak in library.
   ! - Peak is part of a multiplet and this area went
       negative during deconvolution.
   ? - Peak is too narrow.
   @ - Peak is too wide at FW25M, but ok at FWHM.
   % - Peak fails sensitivity test.
   $ - Peak identified, but first peak of this nuclide
       failed one or more qualification tests.
   + - Peak activity higher than counting uncertainty range.
   - - Peak activity lower than counting uncertainty range.
   = - Peak outside analysis energy range.
   & - Calculated peak centroid is not close enough to the
       library energy centroid for positive identification.
   P - Peakbackground subtraction
   } - Peak is too close to another for the activity
       to be found directly.

   Nuclide Codes:                      Peak Codes:
   T - Thermal Neutron Activation      G - Gamma Ray
   F - Fast Neutron Activation         X - X-Ray
   I - Fission Product                 P - Positron Decay
   N - Naturally Occurring Isotope     S - Single-Escape
   P - Photon Reaction                 D - Double-Escape
   C - Charged Particle Reaction       K - Key Line
   M - No MDA Calculation              A - Not in Average
   R - Coincidence Corrected           C - Coincidence Peak
   H - Halflife limit exceeded

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
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***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	6.0417E-02	6.0475E-02	1.4925E-01	1.4929E-01	1.668E-01
K-40	#	4.5569E+00	4.5569E+00	6.7381E-01	7.2557E-01	
MN-54	#A	1.1488E-03	1.1490E-03	1.4611E-02	1.4611E-02	1.788E-02
CO-57	#B	-2.2709E-04	-2.2713E-04	5.7112E-02	5.7112E-02	3.096E-02
CO-60	#B	-9.8684E-05	-9.8686E-05	2.1622E-02	2.1622E-02	2.653E-02

Sr-85	#A	-9.0275E-03	-9.0346E-03	2.5136E-02	2.5141E-02	2.806E-02
Kr-85	#A	-2.4455E+02	-2.4455E+02	7.8121E+02	7.8135E+02	6.553E+02
Y-88	#B	-1.1169E-03	-1.1174E-03	4.0599E-02	4.0599E-02	3.172E-02
NB-94	#B	-1.5613E-03	-1.5613E-03	2.2313E-02	2.2313E-02	2.326E-02
Ag-108M	#B	-8.6994E-04	-8.6994E-04	3.8234E-02	3.8234E-02	4.394E-02
CD-109	#A	4.5217E-01	4.5222E-01	7.9950E-01	7.9989E-01	8.773E-01
SN-113	#B	-1.8821E-03	-1.8829E-03	1.3477E-01	1.3477E-01	3.552E-02
SB-125	#B	4.5223E-03	4.5226E-03	4.8833E-02	4.8834E-02	5.739E-02
I-131	#B	2.6027E-03	2.6194E-03	2.1412E-02	2.1413E-02	2.439E-02
CS-134	#B	-2.9911E-03	-2.9913E-03	8.0404E-02	8.0405E-02	7.291E-02
CS-137	#A	4.0183E-03	4.0183E-03	2.4446E-02	2.4447E-02	2.867E-02
CE-139	#A	5.4582E-03	5.4602E-03	2.6566E-02	2.6568E-02	2.970E-02
EU-152	#B	1.6822E-03	1.6822E-03	8.3745E-02	8.3745E-02	9.419E-02
EU-154	#B	6.5639E-04	6.5640E-04	5.3044E-02	5.3044E-02	5.989E-02
EU-155	#B	5.3247E-02	5.3248E-02	9.5873E-02	9.5918E-02	1.052E-01
HG-203	#B	1.3570E-03	1.3585E-03	2.2861E-02	2.2861E-02	2.609E-02
TL-208	#	6.4909E-02	6.4909E-02	2.9794E-02	3.0040E-02	2.675E-02
PB-212	#	1.6659E-01	1.6659E-01	7.5556E-02	7.6194E-02	7.757E-02
PB-214	#	4.4725E-01	4.4725E-01	8.1060E-02	8.5256E-02	5.821E-02
BI-212	#	1.9700E-01	1.9700E-01	2.0954E-01	2.0986E-01	
BI-214	#	5.4189E-01	5.4189E-01	9.9037E-02	1.0408E-01	
RA-224	#	1.5483E+00	1.5483E+00	7.8043E-01	7.8577E-01	8.008E-01
RA-226	#	1.3840E+00	1.3840E+00	7.8954E-01	7.9376E-01	
AC-228	#	1.6977E-01	1.6977E-01	1.0160E-01	1.0209E-01	1.043E-01
TH-227	#	6.8029E-01	6.8029E-01	2.4648E-01	2.4973E-01	2.396E-01
PA-234	#B	4.4272E-02	4.4272E-02	4.4254E-02	4.4322E-02	1.053E-01
TH-234	#B	4.8807E-01	4.8807E-01	6.0896E-01	6.0956E-01	1.406E+00
AM-241	#A	6.6699E-05	6.6699E-05	1.2708E-01	1.2708E-01	1.440E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (50.2 to 2000.1 keV) 6.6798248E+00 pCi/gm
Total Decayed Activity (50.2 to 2000.1 keV) 6.6798253E+00 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JJM

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 107F_9SEP2006_1034.An1

Sample description
FSS-OOL-05-10-005-F-RC WET

Spectrum Filename: C:\GammaVision\Spectra\107F_9SEP2006_1034.An1

Acquisition information
Start time: 09-Sep-2006 10:34:23
Live time: 2000
Real time: 2007
Dead time: 0.34 %
Detector ID: 2

Detector system
Det 107- DSPE- 634

Calibration
Filename: D7_1LSa.Clb
Detector 107 Calibration for 1 Liter Sand Marinelli

Energy Calibration
Created: 29-Oct-2004 06:48:53
Zero offset: 0.157 keV
Gain: 0.500 keV/channel
Quadratic: -1.676E-08 keV/channel^2

Efficiency Calibration
Created: 29-Oct-2004 06:51:32
Type: Polynomial
Uncertainty: 1.174 %
Coefficients: -0.279532 -4.778179 0.614896
-0.087174 0.005356 -0.000131

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.16keV)
Stop channel: 4000 (2000.15keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 2.0010E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 2.0010E+03) =
4.9975E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	09-Sep-2006 08:47:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	107_150K_28APR05.Pbc 01-May-2005 05:30:33
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 17 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.0661

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
76.26	886.	9.07	1.76	2.919E-02	72.87	6.400	3.403E+00	HG203
					74.81	9.600	2.179E+00	PB212
					77.11	10.700	1.882E+00	PB214
					77.11	17.500	1.157E+00	PB212
86.62	189.	29.76	1.31	3.289E-02	86.45	32.740	1.188E-01	EU155
92.34	216.	26.48	2.02	3.429E-02				
92.34	216.	26.48	2.02	3.429E-02	92.38	2.570	1.598E+00	TH234
					92.80	3.000	1.288E+00	TH234
186.19	178.	22.84	1.73	3.609E-02	185.99	3.280	1.014E+00	RA226
210.19	177.	25.07	1.41	3.421E-02				
239.02	1639.	4.27	2.20	3.186E-02	238.63	43.100	7.975E-01	PB212
					241.00	3.900	8.940E+00	RA224
242.07	158.	23.92	1.30	3.163E-02	241.92	7.470	4.510E-01	PB214
277.69	75.	32.93	0.83	2.890E-02				
295.31	225.	11.57	1.34	2.768E-02	295.22	19.200	2.800E-01	PB214
300.85	59.	35.34	1.34	2.731E-02				
328.15	72.	30.68	1.62	2.559E-02				
338.24	323.	12.19	2.06	2.501E-02	338.40	12.010	7.201E-01	AC228
					344.30	27.000	3.270E-01	EU152
351.93	547.	7.20	2.40	2.426E-02	351.99	37.100	4.063E-01	PB214
462.92	85.	22.56	2.00	1.955E-02				
462.92	85.	22.56	2.00	1.955E-02	463.51	10.000	2.836E-01	SB125
510.89	190.	14.70	2.58	1.808E-02	510.72	22.500	2.599E-01	TL208
583.27	465.	7.42	2.45	1.629E-02	583.14	86.000	2.218E-01	TL208
609.41	410.	7.54	2.44	1.574E-02	609.32	46.090	3.780E-01	BI214
727.67	119.	19.43	0.78	1.374E-02	727.17	11.800	4.952E-01	BI212
767.88	75.	30.37	0.93	1.319E-02				

795.20	49.	34.00	1.68	1.284E-02	795.76	85.400	PBC<MDA	CS134
911.38	323.	7.84	2.88	1.161E-02	911.07	29.000	6.403E-01	AC228
967.83	266.	10.63	2.32	1.110E-02	968.90	17.460	9.187E-01	AC228
1120.30	110.	22.06	1.78	9.970E-03	1120.28	15.040	4.914E-01	BI214
1460.84	2013.	2.27	2.66	8.191E-03	1460.75	10.700	1.548E+01	K40
1620.85	30.	22.58	0.76	7.569E-03	1620.56	2.750	9.668E-01	BI212

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
1764.50	72.	13.55	2.20	7.084E-03	1764.51	15.920	4.306E-01	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
420.01	210.19	661.	177.	0.088	75.21	1.412	NP-239	s
555.01	277.69	248.	81.	0.040	89.35	0.826	NP-239	s
601.33	300.76	189.	59.	0.030	106.02	1.342	PB-212	lD
655.92	328.15	198.	72.	0.036	92.03	1.618	AC-228	
1535.34	767.88	136.	75.	0.038	74.18	0.929	BI-214	sM

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.
M - Peak is close to a library peak.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-212	149.29	74.81	862.	250.	0.125	52.46	1.178D
PB-212	153.89	77.11	918.	357.	0.179	31.50	1.179A
EU-155	173.76	87.05	1646.	151.	0.076	116.57	1.500
TH-234	185.32	92.83	1531.	147.	0.074	109.28	1.500s
TH-234	185.21	92.77	1494.	137.	0.068	106.84	1.500s
RA-226	371.08	185.72	773.	132.	0.066	93.14	1.500s
TH-227	471.39	235.88	1632.	-173.	-0.087	101.57	1.500s
PB-212	476.89	238.63	634.	949.	0.474	14.59	1.297D
RA-224	477.35	238.86	1020.	830.	0.415	19.30	1.500s
PB-214	483.47	241.92	647.	158.	0.079	71.77	1.299D
PB-214	590.07	295.22	279.	247.	0.123	34.94	1.563s
AC-228	676.10	338.24	376.	320.	0.160	36.56	2.055s
PB-214	703.46	351.93	329.	541.	0.271	21.60	2.397s
SB-125	925.34	462.87	159.	67.	0.033	84.13	1.500s
TL-208	1021.36	510.89	218.	157.	0.078	44.10	2.583s
TL-208	1166.12	583.27	195.	460.	0.230	22.26	2.447s
BI-214	1218.40	609.41	170.	406.	0.203	22.61	2.445s
BI-212	1454.91	727.67	130.	119.	0.059	58.28	0.780s
CS-134	1589.96	795.20	117.	49.	0.024	101.99	1.684s
AC-228	1822.31	911.38	101.	319.	0.160	23.51	2.880s
AC-228	1935.23	967.83	139.	263.	0.132	31.88	2.324s
BI-214	2240.16	1120.30	127.	109.	0.055	66.18	1.784s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
K-40	2921.28	1460.84	20.	2008.	1.004	6.80	2.658s
BI-212	3241.31	1620.85	6.	30.	0.015	67.75	0.759s
BI-214	3528.66	1764.50	8.	72.	0.036	40.64	2.198

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	Peak MDA Value pCi/gm	COMMENTS
BE-7		1.5286E-03					
			477.56	1.529E-03	&(	1.908E-01 5.51E-02	G
K-40		1.5476E+01					
			1460.75	1.548E+01	*(P	1.796E-01 3.52E-01	G
MN-54		9.5009E-04					
			834.81	9.501E-04	%(P	2.572E-02 7.38E-03	G
CO-57		1.0357E-02					
			122.07	1.036E-02	%(P	3.336E-02 1.01E-02	G K
			136.43	-3.239E-02	& P	2.601E-01 7.79E-02	G
CO-60		-1.0496E-02					
			1332.51	-1.050E-02	%(P	3.293E-02 9.43E-03	G K
			1173.23	5.051E-03	% P	3.939E-02 1.14E-02	G K
Sr-85		-1.3675E-02					
			514.00	-1.367E-02	&(	3.237E-02 9.78E-03	G
Kr-85		-3.4161E+02					
			513.99	-3.416E+02	&(P	7.500E+02 2.26E+02	G
Y-88		-1.5033E-03					
			1836.01	-1.503E-03	%(P	2.156E-02 5.65E-03	G K
			898.02	-1.700E-03	% P	2.644E-02 7.47E-03	G
NB-94		-2.1501E-05					
			871.10	-2.150E-05	&(P	2.519E-02 7.18E-03	G K
			702.50	8.871E-04	% P	2.161E-02 6.19E-03	G K
Ag-108M		6.2735E-04					
			722.95	6.274E-04	&(	4.588E-02 1.35E-02	G K
			614.37	-1.138E-02	%	3.315E-02 9.95E-03	G
			433.93	-5.423E-03	& P	2.677E-02 7.91E-03	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CD-109	-1.6145E-01						
		88.04	-1.614E-01	&(P	1.104E+00	3.32E-01	G
SN-113	-8.3867E-03						
		391.71	-8.387E-03	%(P	3.508E-02	1.04E-02	G K
		255.04	1.136E-02	%	1.104E+00	3.27E-01	G
SB-125	5.3511E-02						
		427.95	-6.510E-03	&(P	7.187E-02	2.10E-02	G K
		600.77	-6.181E-03	& P	1.096E-01	3.12E-02	G
		636.15	4.105E-02	% P	1.973E-01	5.80E-02	G
		463.51	2.312E-01	(P	2.124E-01	6.76E-02	G
		176.29	-1.289E-02	% P	4.001E-01	1.19E-01	G
I-131	3.3624E-03						
		364.48	3.362E-03	&(	2.596E-02	7.67E-03	G K
		636.97	7.120E-02	%	2.909E-01	8.58E-02	G
		284.29	-7.117E-02	%	3.880E-01	1.16E-01	G
CS-134	-1.7768E-02						
		604.66	-1.777E-02	%(P	3.805E-02	1.15E-02	G K
		795.76	3.015E-02	+ P	3.275E-02	1.04E-02	G
		569.29	-2.346E-02	%	1.630E-01	4.79E-02	G
		801.84	-9.943E-02	% P	3.779E-01	1.12E-01	G
CS-137	2.6631E-03						
		661.62	2.663E-03	%(P	3.500E-02	1.02E-02	G
CE-139	4.0352E-04						
		165.85	4.035E-04	%(P	3.326E-02	9.91E-03	G
EU-152	2.5992E-02						
		121.78	2.599E-02	%(P	9.840E-02	2.96E-02	G K
		344.30	9.774E-03	% P	6.749E-02	1.99E-02	G
		1408.08	-2.681E-03	% P	1.348E-01	3.75E-02	G
		964.00	-2.074E-03	& P	3.148E-01	9.21E-02	G
		1112.07	1.139E-02	% P	2.521E-01	7.27E-02	G
		778.90	-5.577E-03	% P	1.903E-01	5.44E-02	G
EU-154	1.0006E-02						
		123.10	1.001E-02	%(P	7.024E-02	2.11E-02	G K
		1274.80	-7.029E-04	% P	1.059E-01	3.04E-02	G
		723.30	-9.739E-02	% P	1.883E-01	5.72E-02	G
		1004.80	9.168E-03	& P	1.729E-01	4.99E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
EU-155	9.4852E-02						
		86.45	9.485E-02	(	1.205E-01	3.69E-02	G K
		105.31	4.773E-02	% P	1.271E-01	3.84E-02	G
HG-203	-4.4870E-03						
		279.17	-4.487E-03	&(P	2.850E-02	8.47E-03	G K
		72.87	1.341E-01	% P	8.239E-01	2.48E-01	G
		70.83	-4.664E-01	&	1.463E+00	4.42E-01	G
		82.50	1.234E-01	%	1.733E+00	5.19E-01	G
TL-208	2.2968E-01						
		583.14	2.218E-01	*(P	3.267E-02	1.66E-02	G
		510.72	2.599E-01	*(P	1.188E-01	4.64E-02	G
PB-212	4.6615E-01						
		238.63	4.662E-01	(P	5.898E-02	2.31E-02	G K
							Energy duplication
		77.11	4.662E-01	}	1.878E-01	4.89E-02	G
		74.81	6.172E-01	+ P	3.445E-01	1.10E-01	G
PB-214	4.1381E-01						
		351.99	4.063E-01	*(P	6.541E-02	2.95E-02	G K
		295.22	3.135E-01	- P	1.024E-01	3.72E-02	G
							Energy duplication
		77.11	1.755E-01	} P	4.049E-01	1.10E-01	G
		241.92	4.510E-01	(P	3.466E-01	1.09E-01	G
BI-212	4.9521E-01						
		727.17	4.952E-01	*(P	2.326E-01	9.73E-02	G K
		1620.56	9.668E-01	+ P	4.645E-01	2.22E-01	G
		785.42	2.615E-01	% P	1.299E+00	3.81E-01	G
BI-214	3.9148E-01						
		609.32	3.780E-01	*(P	5.907E-02	2.88E-02	G K
		1764.51	4.306E-01	(P	9.563E-02	5.91E-02	G
		1120.28	4.914E-01	+ P	2.486E-01	1.09E-01	G
RA-224	4.5342E+00						
		241.00	4.534E+00	&(P	8.275E-01	2.92E-01	G
RA-226	7.5265E-01						
		185.99	7.526E-01	*(	7.545E-01	2.34E-01	G
AC-228	6.6366E-01						
		911.07	6.403E-01	*(P	9.931E-02	5.09E-02	G K
		968.90	9.187E-01	+ P	2.007E-01	9.84E-02	G
		338.40	7.201E-01	*(P	2.093E-01	8.87E-02	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments

TH-227      -3.2568E-01
                          236.00-3.257E-01 ?(P 3.586E-01 1.10E-01 G K
                          256.25-8.448E-03 % P 2.479E-01 7.23E-02 G

PA-234       1.0296E-02
                           98.44 1.030E-02 %(  1.212E-01 3.63E-02 G K
                          946.00-9.014E-03 &   1.526E-01 4.42E-02 G
                          131.28 4.578E-05 %   1.470E-01 4.39E-02 G
                           94.67-1.018E-01 %   2.356E-01 7.14E-02 G
                          883.24-5.671E-07 &   2.295E-01 6.58E-02 G
                          926.70-5.477E-03 &   2.482E-01 7.11E-02 G
                          569.26 5.146E-04 %   2.366E-01 6.86E-02 G

TH-234       7.8702E-01
                           63.29 4.782E-01 %(P 1.489E+00 4.48E-01 G K
                           92.80 8.952E-01 *(P 1.197E+00 3.65E-01 G
                           92.38 1.129E+00 *(P 1.418E+00 4.34E-01 G

AM-241      -4.9126E-03
                           59.54-4.913E-03 %(P 1.929E-01 5.76E-02 G
   ( - This peak used in the nuclide activity average.

   * - Peak is too wide, but only one peak in library.
   ! - Peak is part of a multiplet and this area went
       negative during deconvolution.
   ? - Peak is too narrow.
   @ - Peak is too wide at FW25M, but ok at FWHM.
   % - Peak fails sensitivity test.
   $ - Peak identified, but first peak of this nuclide
       failed one or more qualification tests.
   + - Peak activity higher than counting uncertainty range.
   - - Peak activity lower than counting uncertainty range.
   = - Peak outside analysis energy range.
   & - Calculated peak centroid is not close enough to the
       library energy centroid for positive identification.
   P - Peakbackground subtraction
   } - Peak is too close to another for the activity
       to be found directly.

   Nuclide Codes:                      Peak Codes:
   T - Thermal Neutron Activation      G - Gamma Ray
   F - Fast Neutron Activation         X - X-Ray
   I - Fission Product                 P - Positron Decay
   N - Naturally Occurring Isotope     S - Single-Escape
   P - Photon Reaction                 D - Double-Escape
   C - Charged Particle Reaction       K - Key Line
   M - No MDA Calculation              A - Not in Average
```

R - Coincidence Corrected C - Coincidence Peak
H - Halflife limit exceeded

- -

***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	1.5271E-03	1.5286E-03	1.6536E-01	1.6536E-01	1.906E-01
K-40	#	1.5476E+01	1.5476E+01	1.0550E+00	1.3959E+00	
MN-54	#A	9.4994E-04	9.5009E-04	2.2153E-02	2.2153E-02	2.572E-02
CO-57	#B	1.0355E-02	1.0357E-02	3.0180E-02	3.0185E-02	3.335E-02
CO-60	#B	-1.0496E-02	-1.0496E-02	4.9884E-02	4.9888E-02	3.293E-02
Sr-85	#A	-1.3664E-02	-1.3675E-02	2.9339E-02	2.9350E-02	3.234E-02
Kr-85	#A	-3.4161E+02	-3.4161E+02	7.8882E+02	7.8908E+02	7.500E+02
Y-88	#B	-1.5026E-03	-1.5033E-03	5.6088E-02	5.6088E-02	2.155E-02
NB-94	#B	-2.1501E-05	-2.1501E-05	3.8358E-02	3.8358E-02	2.519E-02
Ag-108M	#B	6.2735E-04	6.2735E-04	4.0472E-02	4.0472E-02	4.588E-02
CD-109	#A	-1.6143E-01	-1.6145E-01	1.0168E+00	1.0169E+00	1.104E+00
SN-113	#B	-8.3830E-03	-8.3867E-03	3.8253E-02	3.8257E-02	3.506E-02
SB-125	#B	5.3508E-02	5.3511E-02	4.6913E-02	4.7019E-02	7.187E-02
I-131	#B	3.3409E-03	3.3624E-03	2.2997E-02	2.2998E-02	2.580E-02
CS-134	#B	-1.7767E-02	-1.7768E-02	3.5451E-02	3.5467E-02	3.805E-02
CS-137	#A	2.6631E-03	2.6631E-03	3.0589E-02	3.0590E-02	3.500E-02
CE-139	#A	4.0337E-04	4.0352E-04	2.9739E-02	2.9739E-02	3.325E-02
EU-152	#B	2.5992E-02	2.5992E-02	8.8889E-02	8.8901E-02	9.840E-02
EU-154	#B	1.0006E-02	1.0006E-02	6.3169E-02	6.3171E-02	7.024E-02
EU-155	#A	9.4849E-02	9.4852E-02	1.1057E-01	1.1069E-01	1.205E-01
HG-203	#B	-4.4820E-03	-4.4870E-03	3.0020E-02	3.0021E-02	2.847E-02
TL-208	#	2.2968E-01	2.2968E-01	5.1624E-02	5.3377E-02	
PB-212		4.6615E-01	4.6615E-01	6.9151E-02	7.4430E-02	
PB-214		4.1381E-01	4.1381E-01	9.0235E-02	9.3487E-02	
BI-212		4.9521E-01	4.9521E-01	2.9173E-01	2.9319E-01	
BI-214		3.9148E-01	3.9148E-01	8.9467E-02	9.2406E-02	
RA-224	#	4.5342E+00	4.5342E+00	8.7735E-01	9.1731E-01	8.275E-01
RA-226	#A	7.5265E-01	7.5265E-01	7.0098E-01	7.0239E-01	7.545E-01
AC-228	#	6.6366E-01	6.6366E-01	1.4581E-01	1.5098E-01	
TH-227	#A	-3.2568E-01	-3.2568E-01	3.3132E-01	3.3188E-01	3.586E-01
PA-234	#B	1.0296E-02	1.0296E-02	1.0879E-01	1.0879E-01	1.212E-01
TH-234	#B	7.8702E-01	7.8702E-01	8.5931E-01	8.6041E-01	1.489E+00
AM-241	#A	-4.9126E-03	-4.9126E-03	2.3419E-01	2.3419E-01	1.929E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.

H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (277.7 to 2000.1 keV) 1.8136333E+01 pCi/gm
Total Decayed Activity (277.7 to 2000.1 keV) 1.8136333E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JJM

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 107F_9SEP2006_1114.An1

Sample description
FSS-OOL-05-10-010-F WET

Spectrum Filename: C:\GammaVision\Spectra\107F_9SEP2006_1114.An1

Acquisition information
Start time: 09-Sep-2006 11:14:51
Live time: 2000
Real time: 2002
Dead time: 0.11 %
Detector ID: 2

Detector system
Det 107- DSPE- 634

Calibration
Filename: D7_1LSa.Clb
Detector 107 Calibration for 1 Liter Sand Marinelli

Energy Calibration
Created: 29-Oct-2004 06:48:53
Zero offset: 0.157 keV
Gain: 0.500 keV/channel
Quadratic: -1.676E-08 keV/channel^2

Efficiency Calibration
Created: 29-Oct-2004 06:51:32
Type: Polynomial
Uncertainty: 1.174 %
Coefficients: -0.279532 -4.778179 0.614896
-0.087174 0.005356 -0.000131

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.16keV)
Stop channel: 4000 (2000.15keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 2.0010E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 2.0010E+03) =
4.9975E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	09-Sep-2006 10:25:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	107_150K_28APR05.Pbc 01-May-2005 05:30:33
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 13 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.2301

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
77.03	311.	18.29	1.50	2.957E-02	74.81	9.600	7.672E-01	PB212
					77.11	10.700	6.632E-01	PB214
					77.11	17.500	4.055E-01	PB212
77.03	316.	18.29	1.50	2.957E-02	77.11	10.700	6.632E-01	PB214
					77.11	17.500	4.117E-01	PB212
92.55	144.	39.06	1.61	3.433E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
186.32	262.	18.77	1.89	3.608E-02	185.99	3.280	1.495E+00	RA226
239.23	1332.	4.53	2.38	3.185E-02	236.00	11.200	2.502E+00	TH227
					238.63	43.100	6.469E-01	PB212
295.17	241.	16.16	2.15	2.768E-02				
295.17	241.	16.16	2.15	2.768E-02	295.22	19.200	3.008E-01	PB214
338.14	328.	10.60	2.77	2.502E-02	338.40	12.010	7.304E-01	AC228
351.99	659.	5.82	2.33	2.426E-02	351.99	37.100	4.907E-01	PB214
510.81	52.	23.44	1.50	1.808E-02	510.72	22.500	PBC<MDA	TL208
583.21	416.	7.66	2.26	1.629E-02	583.14	86.000	1.983E-01	TL208
609.47	440.	6.89	1.94	1.574E-02	609.32	46.090	4.059E-01	BI214
726.83	122.	21.67	0.80	1.375E-02	727.17	11.800	5.006E-01	BI212
785.03	43.	41.26	1.31	1.297E-02				
785.03	43.	41.26	1.31	1.297E-02	785.42	2.000	PBC<MDA	BI212
794.67	41.	33.69	1.68	1.284E-02	795.76	85.400	PBC<MDA	CS134
911.19	266.	10.10	2.73	1.161E-02	911.07	29.000	5.256E-01	AC228
968.04	226.	9.78	2.76	1.110E-02	968.90	17.460	7.802E-01	AC228
1120.37	72.	19.90	1.90	9.970E-03	1120.28	15.040	3.228E-01	BI214
1460.90	1449.	2.69	2.73	8.190E-03	1460.75	10.700	1.113E+01	K40
1764.91	66.	15.64	2.29	7.084E-03	1764.51	15.920	3.946E-01	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
184.77	92.55	1165.	144.	0.072	117.18	1.607	PB-214	l
478.09	239.23	1330.	665.	0.333	25.99	2.384	PB-212	s
703.59	351.99	709.	203.	0.101	59.52	2.334	PB-214	s
1166.01	583.21	388.	190.	0.095	49.16	2.258	TL-208	s
1218.52	609.47	397.	185.	0.092	50.83	1.941	BI-214	s
1569.64	785.03	86.	43.	0.022	123.79	1.310	BI-212	l

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-214	153.89	77.11	1513.	311.	0.155	54.88	1.500D
PB-212	153.89	77.11	1508.	316.	0.158	54.88	1.500D
RA-226	372.27	186.32	745.	262.	0.131	56.31	1.887s
TH-227	477.08	238.72	883.	605.	0.302	24.14	1.500s
PB-212	477.12	238.75	1008.	685.	0.343	22.17	1.500s
PB-214	590.35	295.37	457.	197.	0.098	49.62	1.500s
AC-228	675.80	338.09	296.	335.	0.167	32.40	2.787s
PB-214	703.59	351.99	319.	451.	0.225	21.65	1.500D
TL-208	1021.21	510.81	192.	52.	0.026	70.31	1.500s
TL-208	1166.09	583.25	195.	222.	0.111	32.68	1.540s
BI-214	1218.29	609.36	127.	309.	0.155	22.64	1.558s
Ag-108M	1225.80	613.11	260.	-58.	-0.029	124.73	1.561s
BI-212	1453.23	726.83	141.	120.	0.060	65.02	0.798s
CS-134	1588.90	794.67	79.	41.	0.021	101.08	1.684s
AC-228	1821.94	911.19	113.	262.	0.131	30.31	2.726s
AC-228	1935.64	968.04	77.	224.	0.112	29.34	2.755s
BI-214	2240.31	1120.37	69.	72.	0.036	59.69	1.897s
K-40	2921.40	1460.90	20.	1444.	0.722	8.08	2.729s
BI-214	3529.48	1764.91	22.	66.	0.033	46.93	2.291s

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	MDA Value pCi/gm	COMMENTS
BE-7		4.5782E-02					
			477.56	4.578E-02	%(	1.858E-01 5.50E-02	G
K-40		1.1127E+01					
			1460.75	1.113E+01	*(P	1.812E-01 3.01E-01	G
MN-54		9.5306E-03					
			834.81	9.531E-03	&(P	2.348E-02 7.05E-03	G
CO-57		3.8563E-04					
			122.07	3.856E-04	%(P	3.075E-02 9.16E-03	G K
			136.43	5.337E-02	% P	2.405E-01 7.22E-02	G
CO-60		6.2344E-03					
			1332.51	6.234E-03	&(P	2.177E-02 6.18E-03	G K
			1173.23	1.056E-02	% P	3.310E-02 9.75E-03	G K
Sr-85		-1.2001E-02					
			514.00	-1.200E-02	%(	2.893E-02 8.73E-03	G
Kr-85		-3.0307E+02					
			513.99	-3.031E+02	%(P	6.716E+02 2.02E+02	G
Y-88		-4.2776E-03					
			1836.01	-4.278E-03	%(P	2.242E-02 6.14E-03	G K
			898.02	3.223E-03	% P	2.558E-02 7.35E-03	G
NB-94		6.6343E-03					
			871.10	6.634E-03	%(P	2.187E-02 6.47E-03	G K
			702.50	2.537E-03	% P	2.355E-02 6.83E-03	G K
Ag-108M		1.0885E-02					
			722.95	1.089E-02	&(	1.809E-02 5.60E-03	G K
			614.37	-2.762E-02	&	3.719E-02 1.15E-02	G
			433.93	-6.416E-03	% P	2.376E-02 7.03E-03	G
CD-109		5.4366E-01					
			88.04	5.437E-01	&(P	8.823E-01 2.69E-01	G
SN-113		-9.2363E-03					
			391.71	-9.236E-03	%(P	3.442E-02 1.02E-02	G K
			255.04	1.644E-01	&	9.877E-01 2.94E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	-3.9514E-03						
		427.95	-3.951E-03	%(P	6.424E-02	1.86E-02	G K
		600.77	2.064E-02	% P	1.105E-01	3.23E-02	G
		636.15	4.086E-02	% P	1.649E-01	4.84E-02	G
		463.51	9.934E-02	% P	2.094E-01	6.32E-02	G
		176.29	-9.524E-02	% P	3.633E-01	1.09E-01	G
I-131	-3.1228E-03						
		364.48	-3.123E-03	&(	2.306E-02	6.79E-03	G K
		636.97	7.146E-02	%	2.661E-01	7.85E-02	G
		284.29	-3.112E-04	%	3.301E-01	9.69E-02	G
CS-134	1.2251E-02						
		604.66	7.352E-04	%(P	5.551E-02	1.65E-02	G K
		795.76	2.541E-02	*(P	2.714E-02	8.67E-03	G
		569.29	1.544E-02	&	1.183E-01	3.43E-02	G
		801.84	-4.520E-02	% P	3.040E-01	8.87E-02	G
CS-137	6.9954E-03						
		661.62	6.995E-03	%(P	2.993E-02	8.80E-03	G
CE-139	4.6871E-03						
		165.85	4.687E-03	&(P	2.960E-02	8.86E-03	G
EU-152	-3.1134E-02						
		121.78	-3.113E-02	&(P	7.841E-02	2.37E-02	G K
		344.30	-2.863E-02	% P	7.296E-02	2.19E-02	G
		1408.08	5.255E-02	& P	1.033E-01	3.14E-02	G
		964.00	2.026E-02	& P	3.053E-01	8.97E-02	G
		1112.07	6.568E-02	% P	1.919E-01	5.70E-02	G
		778.90	3.999E-02	% P	1.288E-01	3.79E-02	G
EU-154	2.3435E-02						
		123.10	2.343E-02	%(P	6.494E-02	1.96E-02	G K
		1274.80	-1.367E-02	% P	8.104E-02	2.34E-02	G
		723.30	4.566E-02	& P	1.152E-01	3.46E-02	G
		1004.80	3.870E-03	% P	1.855E-01	5.35E-02	G
EU-155	6.0686E-02						
		86.45	6.069E-02	%(	1.131E-01	3.44E-02	G K
		105.31	-4.406E-04	% P	1.172E-01	3.48E-02	G
HG-203	-2.1477E-03						
		279.17	-2.148E-03	&(P	2.679E-02	7.91E-03	G K
		72.87	-2.537E-01	% P	8.007E-01	2.42E-01	G
		70.83	5.505E-02	%	1.285E+00	3.84E-01	G
		82.50	2.180E-01	%	1.695E+00	5.09E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	1.0262E-01						
		583.14	1.069E-01	*(P	3.270E-02	1.19E-02	G
		510.72	8.624E-02	*(P	1.117E-01	3.33E-02	G
PB-212	3.5837E-01						
		238.63	3.367E-01	*(P	7.400E-02	2.55E-02	G K
							Energy duplication
		77.11	4.117E-01	*(	2.397E-01	7.53E-02	G
		74.81	3.208E-01	& P	4.962E-01	1.51E-01	G
PB-214	3.3838E-01						
							Energy duplication
		351.99	3.384E-01	*(P	6.446E-02	2.47E-02	G K
		295.22	2.499E-01	- P	1.301E-01	4.23E-02	G
							Energy duplication
		77.11	6.632E-01	+ P	3.926E-01	1.23E-01	G
		241.92	-2.499E-01	& P	5.220E-01	1.58E-01	G
BI-212	5.0063E-01						
		727.17	5.006E-01	*(P	2.416E-01	1.10E-01	G K
		1620.56	2.160E-01	& P	7.802E-01	2.25E-01	G
		785.42	7.183E-01	% P	1.161E+00	3.57E-01	G
BI-214	2.9642E-01						
		609.32	2.878E-01	*(P	5.147E-02	2.20E-02	G K
		1764.51	3.946E-01	+ P	1.473E-01	6.26E-02	G
		1120.28	3.228E-01	*(P	1.863E-01	6.50E-02	G
RA-224	-1.9817E-01						
		241.00	-1.982E-01	&(P	9.703E-01	2.91E-01	G
RA-226	1.4954E+00						
		185.99	1.495E+00	*(	7.408E-01	2.81E-01	G
AC-228	5.2555E-01						
		911.07	5.256E-01	*(P	1.048E-01	5.40E-02	G K
		968.90	7.802E-01	+ P	1.523E-01	7.70E-02	G
		338.40	7.534E-01	+ P	1.864E-01	8.21E-02	G
TH-227	1.1359E+00						
		236.00	1.136E+00	?(P	2.651E-01	9.14E-02	G K
		256.25	6.309E-02	% P	3.246E-01	9.68E-02	G
PA-234	6.8163E-03						
		98.44	6.816E-03	%(	1.202E-01	3.59E-02	G K
		946.00	-7.465E-03	&	1.355E-01	3.89E-02	G
		131.28	-4.948E-02	&	1.413E-01	4.27E-02	G
		94.67	-8.827E-02	%	2.161E-01	6.54E-02	G
		883.24	2.570E-03	%	1.812E-01	5.12E-02	G
		926.70	-7.234E-02	%	2.381E-01	7.07E-02	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26 2.266E-02 &   1.756E-01 5.10E-02 G

TH-234       1.4781E-01
                           63.29 1.478E-01 %(P 1.419E+00 4.24E-01 G K
                           92.80 6.371E-01 % P 1.132E+00 3.43E-01 G
                           92.38-1.427E-01 % P 1.317E+00 3.93E-01 G

AM-241       5.7069E-03
                           59.54 5.707E-03 &(P 1.580E-01 4.70E-02 G
   ( - This peak used in the nuclide activity average.

   * - Peak is too wide, but only one peak in library.
   ! - Peak is part of a multiplet and this area went
       negative during deconvolution.
   ? - Peak is too narrow.
   @ - Peak is too wide at FW25M, but ok at FWHM.
   % - Peak fails sensitivity test.
   $ - Peak identified, but first peak of this nuclide
       failed one or more qualification tests.
   + - Peak activity higher than counting uncertainty range.
   - - Peak activity lower than counting uncertainty range.
   = - Peak outside analysis energy range.
   & - Calculated peak centroid is not close enough to the
       library energy centroid for positive identification.
   P - Peakbackground subtraction
   } - Peak is too close to another for the activity
       to be found directly.

   Nuclide Codes:                      Peak Codes:
   T - Thermal Neutron Activation      G - Gamma Ray
   F - Fast Neutron Activation         X - X-Ray
   I - Fission Product                 P - Positron Decay
   N - Naturally Occurring Isotope     S - Single-Escape
   P - Photon Reaction                 D - Double-Escape
   C - Charged Particle Reaction       K - Key Line
   M - No MDA Calculation              A - Not in Average
   R - Coincidence Corrected           C - Coincidence Peak
   H - Halflife limit exceeded

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***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	4.5762E-02	4.5782E-02	1.6502E-01	1.6504E-01	1.857E-01
K-40	#	1.1127E+01	1.1127E+01	9.0177E-01	1.1158E+00	
MN-54	#A	9.5299E-03	9.5306E-03	2.1136E-02	2.1144E-02	2.347E-02
CO-57	#B	3.8560E-04	3.8563E-04	2.7490E-02	2.7490E-02	3.074E-02
CO-60	#B	6.2343E-03	6.2344E-03	1.8554E-02	1.8558E-02	2.177E-02

Sr-85	#A	-1.1996E-02	-1.2001E-02	2.6201E-02	2.6211E-02	2.892E-02
Kr-85	#A	-3.0306E+02	-3.0307E+02	7.1870E+02	7.1892E+02	6.716E+02
Y-88	#B	-4.2766E-03	-4.2776E-03	2.6968E-02	2.6969E-02	2.241E-02
NB-94	#B	6.6343E-03	6.6343E-03	1.9402E-02	1.9406E-02	2.187E-02
Ag-108M	#B	1.0885E-02	1.0885E-02	1.6798E-02	1.6811E-02	1.809E-02
CD-109	#A	5.4363E-01	5.4366E-01	8.0643E-01	8.0700E-01	8.823E-01
SN-113	#B	-9.2344E-03	-9.2363E-03	3.6891E-02	3.6895E-02	3.441E-02
SB-125	#B	-3.9513E-03	-3.9514E-03	1.2679E-01	1.2679E-01	6.424E-02
I-131	#B	-3.1135E-03	-3.1228E-03	2.0365E-02	2.0366E-02	2.299E-02
CS-134	#B	1.2250E-02	1.2251E-02	1.2542E-02	1.2563E-02	5.551E-02
CS-137	#A	6.9954E-03	6.9954E-03	2.6388E-02	2.6391E-02	2.993E-02
CE-139	#A	4.6862E-03	4.6871E-03	2.6566E-02	2.6567E-02	2.959E-02
EU-152	#B	-3.1133E-02	-3.1134E-02	7.1467E-02	7.1488E-02	7.841E-02
EU-154	#B	2.3434E-02	2.3435E-02	5.8825E-02	5.8839E-02	6.494E-02
EU-155	#B	6.0686E-02	6.0686E-02	1.0313E-01	1.0318E-01	1.131E-01
HG-203	#B	-2.1466E-03	-2.1477E-03	3.3713E-02	3.3713E-02	2.678E-02
TL-208	#	1.0262E-01	1.0262E-01	3.4224E-02	3.4757E-02	3.270E-02
PB-212	#	3.5837E-01	3.5837E-01	8.1281E-02	8.3992E-02	7.400E-02
PB-214	#	3.3838E-01	3.3838E-01	7.4094E-02	7.6742E-02	6.446E-02
BI-212	#	5.0063E-01	5.0063E-01	3.2900E-01	3.3032E-01	
BI-214	#	2.9642E-01	2.9642E-01	6.8035E-02	7.0252E-02	5.147E-02
RA-224	#A	-1.9817E-01	-1.9817E-01	9.8912E-01	9.8919E-01	9.703E-01
RA-226	#	1.4954E+00	1.4954E+00	8.4205E-01	8.4667E-01	
AC-228	#	5.2555E-01	5.2555E-01	1.6185E-01	1.6480E-01	
TH-227	#	1.1359E+00	1.1359E+00	2.7429E-01	2.8237E-01	2.651E-01
PA-234	#B	6.8163E-03	6.8163E-03	1.0775E-01	1.0775E-01	1.202E-01
TH-234	#B	1.4781E-01	1.4781E-01	1.2716E+00	1.2716E+00	1.419E+00
AM-241	#A	5.7069E-03	5.7069E-03	1.4113E-01	1.4113E-01	1.580E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (50.2 to 2000.1 keV) 1.3648896E+01 pCi/gm
Total Decayed Activity (50.2 to 2000.1 keV) 1.3648896E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JJM

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 107F_9SEP2006_1153.An1

Sample description
FSS-OOL-05-10-008-F-A

Spectrum Filename: C:\GammaVision\Spectra\107F_9SEP2006_1153.An1

Acquisition information
Start time: 09-Sep-2006 11:53:31
Live time: 2000
Real time: 2001
Dead time: 0.06 %
Detector ID: 2

Detector system
Det 107- DSPE- 634

Calibration
Filename: D7_1LSa.Clb
Detector 107 Calibration for 1 Liter Sand Marinelli

Energy Calibration
Created: 29-Oct-2004 06:48:53
Zero offset: 0.157 keV
Gain: 0.500 keV/channel
Quadratic: -1.676E-08 keV/channel^2

Efficiency Calibration
Created: 29-Oct-2004 06:51:32
Type: Polynomial
Uncertainty: 1.174 %
Coefficients: -0.279532 -4.778179 0.614896
-0.087174 0.005356 -0.000131

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.16keV)
Stop channel: 4000 (2000.15keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 1.5060E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.5060E+03) =
6.6401E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	09-Sep-2006 10:07:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	107_150K_28APR05.Pbc 01-May-2005 05:30:33
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 13 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.1218

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
76.21	444.	10.79	1.57	2.917E-02	74.81	9.600	1.442E+00	PB212
					77.11	17.500	7.689E-01	PB212
					77.11	10.700	1.244E+00	PB214
186.37	182.	17.85	2.50	3.607E-02	185.99	3.280	1.381E+00	RA226
239.46	570.	7.89	2.37	3.183E-02	238.63	43.100	3.615E-01	PB212
241.97	109.	22.61	1.30	3.163E-02	241.00	3.900	7.886E-01	RA224
					241.92	7.470	4.127E-01	PB214
295.21	325.	11.66	2.17	2.768E-02	295.22	19.200	5.408E-01	PB214
338.90	100.	23.57	1.56	2.497E-02	338.40	12.010	2.892E-01	AC228
352.14	448.	6.61	2.09	2.425E-02	351.99	37.100	4.420E-01	PB214
583.51	164.	11.15	2.55	1.628E-02	583.14	86.000	1.022E-01	TL208
609.50	372.	6.38	2.03	1.574E-02	609.32	46.090	4.542E-01	BI214
727.60	35.	24.88	1.64	1.374E-02	727.17	11.800	1.943E-01	BI212
911.45	111.	12.83	2.54	1.160E-02	911.07	29.000	2.835E-01	AC228
968.99	85.	16.88	1.38	1.109E-02	968.90	17.460	3.955E-01	AC228
1120.07	96.	14.00	0.85	9.970E-03	1120.28	15.040	5.752E-01	BI214
1461.08	530.	4.67	2.65	8.190E-03	1460.75	10.700	5.378E+00	K40
1764.96	77.	11.32	2.39	7.084E-03	1764.51	15.920	6.135E-01	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
1166.60	583.51	175.	48.	0.024	124.69	2.553	TL-208	s

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-212	149.29	74.81	357.	119.	0.059	70.49	1.178D
PB-212	153.89	77.11	389.	82.	0.041	96.97	1.179A
PB-214	153.89	77.11	583.	125.	0.062	82.01	1.500A
RA-226	371.79	186.08	348.	131.	0.065	65.85	1.500s
PB-212	476.89	238.63	246.	253.	0.127	30.13	1.297D
PB-214	483.47	241.92	256.	109.	0.054	67.83	1.299D
PB-214	590.04	295.21	289.	320.	0.160	34.97	2.173s
AC-228	677.09	338.74	144.	83.	0.042	77.18	1.534s
PB-214	703.90	352.14	144.	443.	0.222	19.83	2.087s
TL-208	1166.43	583.42	70.	112.	0.056	40.59	1.540s
BI-214	1218.57	609.50	64.	367.	0.184	19.13	2.029s
BI-212	1454.77	727.60	24.	35.	0.018	74.65	1.638s
AC-228	1822.47	911.45	37.	106.	0.053	38.49	2.539s
AC-228	1937.53	968.99	39.	85.	0.043	50.64	1.382
BI-214	2239.70	1120.07	26.	96.	0.048	42.01	0.846s
K-40	2921.75	1461.08	23.	525.	0.263	14.01	2.651s
BI-214	3529.57	1764.96	1.	77.	0.039	33.97	2.393

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	Peak MDA Value pCi/gm	COMMENTS
BE-7		5.7649E-02					
			477.56	5.765E-02	%(	1.745E-01 5.18E-02	G
K-40		5.3778E+00					
			1460.75	5.378E+00	*(P	2.552E-01 2.53E-01	G
MN-54		-1.2844E-03					
			834.81	-1.284E-03	%(P	2.136E-02 5.91E-03	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CO-57	-3.8235E-03						
		122.07	-3.824E-03	%(P	2.735E-02	8.13E-03	G K
		136.43	4.016E-02	& P	2.266E-01	6.76E-02	G
CO-60	-1.7397E-03						
		1332.51	-1.740E-03	&(P	2.464E-02	6.19E-03	G K
		1173.23	-3.545E-03	% P	3.065E-02	8.12E-03	G K
Sr-85	-4.6076E-03						
		514.00	-4.608E-03	&(	2.622E-02	7.70E-03	G
Kr-85	-1.4076E+02						
		513.99	-1.408E+02	&(P	6.123E+02	1.77E+02	G
Y-88	-1.0706E-03						
		1836.01	-1.071E-03	&(P	3.041E-02	7.97E-03	G K
		898.02	8.093E-03	% P	2.341E-02	6.85E-03	G
NB-94	-1.0170E-04						
		871.10	-1.017E-04	%(P	2.788E-02	7.84E-03	G K
		702.50	-3.392E-04	& P	2.264E-02	6.31E-03	G K
Ag-108M	-9.0175E-03						
		722.95	-9.018E-03	&(	2.640E-02	7.85E-03	G K
		614.37	-2.002E-02	%	3.800E-02	1.16E-02	G
		433.93	-1.977E-03	& P	1.670E-02	4.64E-03	G
CD-109	1.4883E-01						
		88.04	1.488E-01	%(P	9.134E-01	2.73E-01	G
SN-113	3.0881E-03						
		391.71	3.088E-03	&(P	3.002E-02	8.67E-03	G K
		255.04	2.735E-01	%	1.007E+00	3.01E-01	G
SB-125	9.4578E-03						
		427.95	9.458E-03	%(P	5.311E-02	1.53E-02	G K
		600.77	1.126E-02	% P	1.180E-01	3.36E-02	G
		636.15	-1.911E-02	& P	1.902E-01	5.39E-02	G
		463.51	6.535E-02	% P	2.204E-01	6.50E-02	G
		176.29	-9.299E-02	% P	3.687E-01	1.10E-01	G
I-131	-3.5124E-03						
		364.48	-3.512E-03	&(	2.388E-02	6.98E-03	G K
		636.97	-4.055E-02	%	3.068E-01	8.83E-02	G
		284.29	1.167E-01	%	3.446E-01	1.03E-01	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments

CS-134      -1.8575E-04
                          604.66-1.858E-04 %(P 3.541E-02 1.03E-02 G K
                          795.76 1.284E-02 % P 2.291E-02 7.04E-03 G
                          569.29 3.705E-02 %   9.517E-02 2.84E-02 G
                          801.84-4.400E-02 & P 2.769E-01 7.93E-02 G

CS-137      -2.5360E-03
                          661.62-2.536E-03 &(P 3.176E-02 8.85E-03 G

CE-139       5.8180E-03
                          165.85 5.818E-03 %(P 2.859E-02 8.53E-03 G

EU-152       9.4355E-03
                          121.78 9.435E-03 %(P 7.746E-02 2.30E-02 G K
                          344.30-1.202E-02 % P 8.086E-02 2.37E-02 G
                         1408.08 2.120E-02 % P 1.029E-01 2.87E-02 G
                          964.00 5.437E-02 & P 2.011E-01 5.91E-02 G
                         1112.07-3.378E-03 % P 2.726E-01 7.70E-02 G
                          778.90-4.148E-02 % P 1.854E-01 5.36E-02 G

EU-154      -3.1571E-04
                          123.10-3.157E-04 %(P 5.625E-02 1.66E-02 G K
                         1274.80 1.297E-02 & P 8.125E-02 2.31E-02 G
                          723.30-4.733E-02 & P 1.302E-01 3.87E-02 G
                         1004.80-9.632E-04 & P 1.778E-01 5.00E-02 G

EU-155       2.2100E-02
                           86.45 2.210E-02 %(  1.090E-01 3.27E-02 G K
                          105.31 2.187E-02 & P 1.135E-01 3.39E-02 G

HG-203      -4.8616E-03
                          279.17-4.862E-03 &(P 2.747E-02 8.10E-03 G K
                           72.87-1.948E-01 % P 7.309E-01 2.20E-01 G
                           70.83 0.000E+00 %   1.425E+00 4.24E-01 G
                           82.50-4.515E-01 %   1.327E+00 3.99E-01 G

TL-208       7.1455E-02
                          583.14 7.146E-02 *(P 2.668E-02 1.01E-02 G
                          510.72-3.471E-03 % P 1.149E-01 3.03E-02 G

PB-212       1.6524E-01
                          238.63 1.652E-01  (P 4.946E-02 1.76E-02 G K
                                                          Energy duplication
                           77.11 1.421E-01 }   1.640E-01 4.59E-02 G
                           74.81 3.894E-01 + P 2.978E-01 9.45E-02 G
```

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
PB-214	4.3707E-01						
		351.99	4.420E-01	*(P	5.840E-02	2.96E-02	G K
		295.22	5.408E-01	+ P	1.383E-01	6.39E-02	G
							Energy duplication
		77.11	3.541E-01	} P	3.268E-01	9.68E-02	G
		241.92	4.127E-01	(P	2.936E-01	9.46E-02	G
BI-212	1.9431E-01						
		727.17	1.943E-01	(P	1.416E-01	5.01E-02	G K
		1620.56	1.306E-01	% P	8.927E-01	2.45E-01	G
		785.42	1.731E-01	& P	1.255E+00	3.59E-01	G
BI-214	4.5422E-01						
		609.32	4.542E-01	*(P	4.936E-02	2.93E-02	G K
		1764.51	6.135E-01	+ P	5.864E-02	7.03E-02	G
		1120.28	5.752E-01	+ P	1.581E-01	8.13E-02	G
RA-224	3.7219E-01						
		241.00	3.722E-01	%(P	7.883E-01	2.39E-01	G
RA-226	9.9265E-01						
		185.99	9.927E-01	*(	6.792E-01	2.18E-01	G
AC-228	3.2559E-01						
		911.07	2.835E-01	@(P	8.241E-02	3.78E-02	G K
		968.90	3.955E-01	(P	1.468E-01	6.85E-02	G
		338.40	2.486E-01	- P	1.751E-01	6.64E-02	G
TH-227	-1.8755E-01						
		236.00	-1.875E-01	%(P	3.043E-01	9.28E-02	G K
		256.25	8.320E-02	% P	3.116E-01	9.27E-02	G
PA-234	-4.1606E-02						
		98.44	-4.161E-02	&(	1.076E-01	3.25E-02	G K
		946.00	-2.470E-03	&	1.139E-01	3.14E-02	G
		131.28	-3.941E-02	%	1.292E-01	3.89E-02	G
		94.67	1.626E-03	%	1.984E-01	5.89E-02	G
		883.24	5.066E-02	%	1.493E-01	4.39E-02	G
		926.70	5.689E-02	&	1.704E-01	5.01E-02	G
		569.26	5.497E-02	%	1.412E-01	4.21E-02	G
TH-234	1.5250E-01						
		63.29	1.525E-01	%(P	1.341E+00	3.97E-01	G K
		92.80	1.405E-01	% P	1.112E+00	3.30E-01	G
		92.38	2.697E-01	% P	1.267E+00	3.79E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
AM-241	2.1829E-02						
		59.54	2.183E-02	%(P	1.647E-01	4.90E-02	G

(- This peak used in the nuclide activity average.

* - Peak is too wide, but only one peak in library.
! - Peak is part of a multiplet and this area went negative during deconvolution.
? - Peak is too narrow.
@ - Peak is too wide at FW25M, but ok at FWHM.
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$ - Peak identified, but first peak of this nuclide failed one or more qualification tests.
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} - Peak is too close to another for the activity to be found directly.

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M - No MDA Calculation
R - Coincidence Corrected
H - Halflife limit exceeded

Peak Codes:
G - Gamma Ray
X - X-Ray
P - Positron Decay
S - Single-Escape
D - Double-Escape
K - Key Line
A - Not in Average
C - Coincidence Peak

- -

***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	5.7594E-02	5.7649E-02	1.5546E-01	1.5550E-01	1.744E-01
K-40	#	5.3778E+00	5.3778E+00	7.6034E-01	8.2401E-01	
MN-54	#A	-1.2842E-03	-1.2844E-03	2.9042E-02	2.9042E-02	2.136E-02
CO-57	#B	-3.8228E-03	-3.8235E-03	2.5396E-02	2.5397E-02	2.735E-02
CO-60	#B	-1.7397E-03	-1.7397E-03	4.9223E-02	4.9223E-02	2.464E-02
Sr-85	#A	-4.6039E-03	-4.6076E-03	2.3086E-02	2.3088E-02	2.620E-02
Kr-85	#A	-1.4076E+02	-1.4076E+02	8.8095E+02	8.8099E+02	6.123E+02
Y-88	#B	-1.0701E-03	-1.0706E-03	3.8900E-02	3.8900E-02	3.040E-02
NB-94	#B	-1.0170E-04	-1.0170E-04	6.3961E-03	6.3961E-03	2.788E-02
Ag-108M	#B	-9.0175E-03	-9.0175E-03	2.3536E-02	2.3542E-02	2.640E-02
CD-109	#A	1.4881E-01	1.4883E-01	8.1980E-01	8.1984E-01	9.133E-01

SN-113	#B	3.0867E-03	3.0881E-03	2.5998E-02	2.5999E-02	3.001E-02
SB-125	#B	9.4573E-03	9.4578E-03	4.5828E-02	4.5831E-02	5.310E-02
I-131	#B	-3.4901E-03	-3.5124E-03	2.0934E-02	2.0935E-02	2.372E-02
CS-134	#B	-1.8574E-04	-1.8575E-04	1.2733E-01	1.2733E-01	3.541E-02
CS-137	#A	-2.5360E-03	-2.5360E-03	1.8749E-01	1.8749E-01	3.176E-02
CE-139	#A	5.8159E-03	5.8180E-03	2.5591E-02	2.5594E-02	2.858E-02
EU-152	#B	9.4354E-03	9.4355E-03	6.9018E-02	6.9020E-02	7.746E-02
EU-154	#B	-3.1570E-04	-3.1571E-04	5.3765E-02	5.3765E-02	5.625E-02
EU-155	#B	2.2099E-02	2.2100E-02	9.7987E-02	9.7994E-02	1.090E-01
HG-203	#B	-4.8562E-03	-4.8616E-03	2.9825E-02	2.9827E-02	2.744E-02
TL-208	#	7.1455E-02	7.1455E-02	3.0184E-02	3.0478E-02	2.668E-02
PB-212		1.6524E-01	1.6524E-01	5.2877E-02	5.3770E-02	
PB-214		4.3707E-01	4.3707E-01	8.7648E-02	9.1370E-02	
BI-212	#	1.9431E-01	1.9431E-01	1.5038E-01	1.5081E-01	1.416E-01
BI-214		4.5422E-01	4.5422E-01	8.7931E-02	9.1932E-02	
RA-224	#A	3.7219E-01	3.7219E-01	7.1617E-01	7.1651E-01	7.883E-01
RA-226	#	9.9265E-01	9.9265E-01	6.5367E-01	6.5629E-01	6.792E-01
AC-228		3.2559E-01	3.2559E-01	1.0678E-01	1.0850E-01	
TH-227	#B	-1.8755E-01	-1.8755E-01	2.8051E-01	2.8073E-01	3.043E-01
PA-234	#B	-4.1606E-02	-4.1606E-02	9.7437E-02	9.7465E-02	1.076E-01
TH-234	#B	1.5250E-01	1.5250E-01	1.1920E+00	1.1920E+00	1.341E+00
AM-241	#A	2.1829E-02	2.1829E-02	1.4715E-01	1.4715E-01	1.647E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (295.2 to 2000.1 keV) 6.7599592E+00 pCi/gm
Total Decayed Activity (295.2 to 2000.1 keV) 6.7599592E+00 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JJM

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 107F_9SEP2006_1230.An1

Sample description
FSS-OOL-05-10-004-F-A

Spectrum Filename: C:\GammaVision\Spectra\107F_9SEP2006_1230.An1

Acquisition information
Start time: 09-Sep-2006 12:30:29
Live time: 2000
Real time: 2001
Dead time: 0.07 %
Detector ID: 2

Detector system
Det 107- DSPE- 634

Calibration
Filename: D7_1LSa.Clb
Detector 107 Calibration for 1 Liter Sand Marinelli

Energy Calibration
Created: 29-Oct-2004 06:48:53
Zero offset: 0.157 keV
Gain: 0.500 keV/channel
Quadratic: -1.676E-08 keV/channel^2

Efficiency Calibration
Created: 29-Oct-2004 06:51:32
Type: Polynomial
Uncertainty: 1.174 %
Coefficients: -0.279532 -4.778179 0.614896
-0.087174 0.005356 -0.000131

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.16keV)
Stop channel: 4000 (2000.15keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 1.5460E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.5460E+03) =
6.4683E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

YAEC Chemistry Lab Spectrum name: 107F_9SEP2006_1230.An1

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	09-Sep-2006 08:36:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	107_150K_28APR05.Pbc 01-May-2005 05:30:33
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 10 cutoff 20.00000 %
Energy Calibration
Normalized diff: 1.0000

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
75.99	392.	12.77	4.09	2.907E-02	72.87	6.400	1.944E+00	HG203
					74.81	9.600	1.240E+00	PB212
					77.11	10.700	1.069E+00	PB214
					77.11	17.500	6.617E-01	PB212
185.99	145.	19.66	2.09	3.610E-02	185.99	3.280	1.069E+00	RA226
231.98	98.	18.87	1.50	3.211E-02	236.00	11.200	2.386E-01	TH227
239.66	597.	7.42	1.97	3.181E-02	238.63	43.100	3.699E-01	PB212
295.29	317.	10.12	2.76	2.767E-02	295.22	19.200	5.137E-01	PB214
338.80	94.	25.80	1.56	2.498E-02	338.40	12.010	2.628E-01	AC228
352.01	500.	6.57	2.23	2.426E-02	351.99	37.100	4.803E-01	PB214
582.81	151.	12.89	2.12	1.630E-02				
582.81	151.	12.89	2.12	1.630E-02	583.14	86.000	9.138E-02	TL208
609.52	318.	7.14	2.46	1.574E-02	609.32	46.090	3.777E-01	BI214
911.41	64.	17.45	1.76	1.161E-02	911.07	29.000	1.652E-01	AC228
969.16	50.	22.83	1.80	1.109E-02	968.90	17.460	2.268E-01	AC228
1120.64	128.	10.87	2.78	9.967E-03	1120.28	15.040	7.398E-01	BI214
1460.86	482.	4.68	3.07	8.190E-03	1460.75	10.700	4.756E+00	K40
1764.57	77.	11.32	1.03	7.084E-03	1764.51	15.920	5.976E-01	BI214

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

Peak Centroid Channel	Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
151.65	75.99	1003.	143.	0.072	97.06	4.090	BI-207	s
478.95	239.66	649.	328.	0.164	36.92	1.973	PB-212	s
590.21	295.29	447.	92.	0.046	102.62	2.761	PB-214	s

Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM	Suspected	
703.63	352.01	528.	142.	0.071	72.98	2.232	PB-214	s
1165.21	582.81	164.	56.	0.028	105.79	2.123	TL-208	s

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-214	153.89	77.11	911.	144.	0.072	89.04	1.500D
PB-212	153.89	77.11	906.	149.	0.075	89.04	1.500D
RA-226	371.62	185.99	336.	110.	0.055	76.27	1.500D
TH-227	463.59	231.98	123.	98.	0.049	56.60	1.500s
PB-212	477.06	238.71	550.	242.	0.121	42.36	1.500s
PB-214	590.19	295.29	222.	220.	0.110	34.26	1.500s
AC-228	676.38	338.38	151.	60.	0.030	89.95	1.500s
PB-214	703.81	352.10	190.	352.	0.176	22.63	1.500s
TL-208	1166.26	583.34	76.	91.	0.045	48.56	1.540s
BI-214	1218.62	609.52	75.	313.	0.157	21.41	2.455s
AC-228	1822.38	911.41	40.	64.	0.032	52.34	1.761s
AC-228	1937.88	969.16	48.	50.	0.025	68.50	1.799s
BI-214	2240.85	1120.64	20.	127.	0.063	32.62	2.784s
K-40	2921.33	1460.86	11.	477.	0.238	14.05	3.069s
BI-214	3528.80	1764.57	1.	77.	0.039	33.97	1.031s

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	Peak MDA Value pCi/gm	COMMENTS
BE-7		-1.5161E-02					
			477.56	-1.516E-02	&(	1.942E-01 5.59E-02	G
K-40		4.7560E+00					
			1460.75	4.756E+00	*(P	1.821E-01 2.25E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
MN-54	-3.0283E-04						
		834.81	-3.028E-04	%(P	3.057E-02	8.67E-03	G
CO-57	-3.6106E-04						
		122.07	-3.611E-04	%(P	2.909E-02	8.61E-03	G K
		136.43	-3.221E-04	% P	2.029E-01	5.98E-02	G
CO-60	-3.9449E-03						
		1332.51	-3.945E-03	&(P	2.651E-02	6.70E-03	G K
		1173.23	-7.471E-03	& P	3.161E-02	8.65E-03	G K
Sr-85	-7.1341E-03						
		514.00	-7.134E-03	%(	2.867E-02	8.50E-03	G
Kr-85	-1.9822E+02						
		513.99	-1.982E+02	%(P	6.672E+02	1.96E+02	G
Y-88	1.3336E-03						
		1836.01	1.334E-03	&(P	1.682E-02	4.10E-03	G K
		898.02	-1.227E-03	% P	3.017E-02	8.39E-03	G
NB-94	3.9439E-03						
		871.10	3.944E-03	%(P	1.870E-02	5.35E-03	G K
		702.50	-1.462E-03	& P	2.063E-02	5.78E-03	G K
Ag-108M	-5.8315E-05						
		722.95	-5.832E-05	%(	2.773E-02	7.84E-03	G K
		614.37	-1.342E-02	&	3.443E-02	1.03E-02	G
		433.93	-6.806E-04	% P	1.768E-02	4.91E-03	G
CD-109	-6.1773E-03						
		88.04	-6.177E-03	%(P	8.916E-01	2.65E-01	G
SN-113	9.3196E-04						
		391.71	9.320E-04	&(P	3.070E-02	8.81E-03	G K
		255.04	2.372E-01	%	9.878E-01	2.94E-01	G
SB-125	-4.6240E-03						
		427.95	-4.624E-03	%(P	5.762E-02	1.63E-02	G K
		600.77	1.297E-02	& P	1.145E-01	3.27E-02	G
		636.15	-3.065E-03	& P	1.611E-01	4.43E-02	G
		463.51	9.084E-02	% P	1.935E-01	5.81E-02	G
		176.29	-9.734E-03	% P	3.358E-01	9.85E-02	G
I-131	7.0791E-03						
		364.48	7.079E-03	%(	1.376E-02	4.21E-03	G K
		636.97	6.294E-04	%	2.028E-01	5.50E-02	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          284.29 5.479E-03 %   3.544E-01 1.03E-01 G

CS-134       1.0180E-02
                          604.66 1.018E-02 &(P 1.703E-02 5.26E-03 G K
                          795.76 1.100E-02 % P 2.982E-02 8.88E-03 G
                          569.29-7.696E-03 %   1.258E-01 3.57E-02 G
                          801.84-4.363E-02 % P 2.568E-01 7.35E-02 G

CS-137      -1.7798E-03
                          661.62-1.780E-03 &(P 2.627E-02 7.19E-03 G

CE-139       1.0421E-02
                          165.85 1.042E-02 &(P 2.488E-02 7.51E-03 G

EU-152      -2.4179E-02
                          121.78-2.418E-02 %(P 8.552E-02 2.57E-02 G K
                          344.30-1.395E-02 % P 8.474E-02 2.49E-02 G
                         1408.08 3.791E-02 & P 9.792E-02 2.88E-02 G
                          964.00 6.655E-02 % P 9.081E-02 2.98E-02 G
                         1112.07-4.199E-03 % P 1.865E-01 5.10E-02 G
                          778.90-7.553E-03 & P 1.449E-01 3.97E-02 G

EU-154      -1.5190E-03
                          123.10-1.519E-03 %(P 6.307E-02 1.87E-02 G K
                         1274.80 2.115E-03 % P 6.982E-02 1.90E-02 G
                          723.30-1.423E-03 % P 1.761E-01 5.07E-02 G
                         1004.80-1.055E-02 % P 1.440E-01 4.04E-02 G

EU-155       2.2286E-02
                           86.45 2.229E-02 %(  1.081E-01 3.24E-02 G K
                          105.31-9.933E-04 % P 1.189E-01 3.52E-02 G

HG-203      -1.8133E-03
                          279.17-1.813E-03 &(P 2.479E-02 7.23E-03 G K
                           72.87 2.505E-01 % P 7.218E-01 2.18E-01 G
                           70.83-3.203E-02 %   1.126E+00 3.34E-01 G
                           82.50 8.069E-03 %   1.419E+00 4.21E-01 G

TL-208       5.6692E-02
                          583.14 5.669E-02 *(P 2.705E-02 9.64E-03 G
                          510.72-2.293E-02 % P 1.388E-01 3.77E-02 G

PB-212       1.5400E-01
                          238.63 1.540E-01 *(P 7.122E-02 2.32E-02 G K
                                                          Energy duplication
                           77.11 2.520E-01 +   2.415E-01 7.48E-02 G
                           74.81 3.051E-01 % P 4.769E-01 1.45E-01 G
```

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
PB-214	3.5707E-01						
		351.99	3.421E-01	*(P	6.496E-02	2.62E-02	G K
		295.22	3.627E-01	*(P	1.187E-01	4.23E-02	G
							Energy duplication
		77.11	3.990E-01	*(P	3.959E-01	1.22E-01	G
		241.92	-1.151E-02	& P	3.130E-01	9.19E-02	G
BI-212	9.3579E-02						
		727.17	9.358E-02	%(P	2.184E-01	6.55E-02	G K
		1620.56	-1.227E-01	% P	7.734E-01	2.06E-01	G
		785.42	3.200E-01	& P	9.768E-01	2.86E-01	G
BI-214	3.7765E-01						
		609.32	3.777E-01	*(P	5.173E-02	2.73E-02	G K
		1764.51	5.976E-01	+ P	5.713E-02	6.85E-02	G
		1120.28	7.398E-01	+ P	1.375E-01	8.10E-02	G
RA-224	6.7557E-02						
		241.00	6.756E-02	%(P	8.468E-01	2.52E-01	G
RA-226	8.1219E-01						
							Energy duplication
		185.99	8.122E-01	*(	6.507E-01	2.06E-01	G
AC-228	1.8552E-01						
		911.07	1.652E-01	*(P	8.391E-02	3.07E-02	G K
		968.90	2.268E-01	*(P	1.577E-01	5.41E-02	G
		338.40	1.746E-01	*(P	1.746E-01	5.51E-02	G
TH-227	2.3858E-01						
		236.00	2.386E-01	?(P	1.325E-01	4.51E-02	G K
		256.25	6.403E-02	% P	2.820E-01	8.35E-02	G
PA-234	-2.4500E-02						
		98.44	-2.450E-02	%(	1.039E-01	3.11E-02	G K
		946.00	0.000E+00	%	1.491E-01	4.21E-02	G
		131.28	-2.434E-03	%	1.261E-01	3.74E-02	G
		94.67	2.499E-05	%	2.007E-01	5.96E-02	G
		883.24	-1.868E-02	%	1.825E-01	5.15E-02	G
		926.70	0.000E+00	%	2.454E-01	6.88E-02	G
		569.26	-1.022E-02	%	1.804E-01	5.11E-02	G
TH-234	3.5486E-01						
		63.29	3.549E-01	%(P	1.273E+00	3.80E-01	G K
		92.80	4.768E-01	% P	1.071E+00	3.22E-01	G
		92.38	6.903E-01	% P	1.251E+00	3.80E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
AM-241	-9.3667E-03						
		59.54	-9.367E-03	&(P	1.672E-01	4.96E-02	G

(- This peak used in the nuclide activity average.

* - Peak is too wide, but only one peak in library.
! - Peak is part of a multiplet and this area went negative during deconvolution.
? - Peak is too narrow.
@ - Peak is too wide at FW25M, but ok at FWHM.
% - Peak fails sensitivity test.
$ - Peak identified, but first peak of this nuclide failed one or more qualification tests.
+ - Peak activity higher than counting uncertainty range.
- - Peak activity lower than counting uncertainty range.
= - Peak outside analysis energy range.
& - Calculated peak centroid is not close enough to the library energy centroid for positive identification.
P - Peakbackground subtraction
} - Peak is too close to another for the activity to be found directly.

Nuclide Codes:	Peak Codes:
T - Thermal Neutron Activation	G - Gamma Ray
F - Fast Neutron Activation	X - X-Ray
I - Fission Product	P - Positron Decay
N - Naturally Occurring Isotope	S - Single-Escape
P - Photon Reaction	D - Double-Escape
C - Charged Particle Reaction	K - Key Line
M - No MDA Calculation	A - Not in Average
R - Coincidence Corrected	C - Coincidence Peak
H - Halflife limit exceeded	

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***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	-1.5129E-02	-1.5161E-02	1.6763E-01	1.6763E-01	1.938E-01
K-40	#	4.7560E+00	4.7560E+00	6.7468E-01	7.3082E-01	
MN-54	#A	-3.0272E-04	-3.0283E-04	2.2320E-02	2.2320E-02	3.056E-02
CO-57	#B	-3.6090E-04	-3.6106E-04	3.9203E-02	3.9203E-02	2.908E-02
CO-60	#B	-3.9447E-03	-3.9449E-03	7.9187E-01	7.9187E-01	2.651E-02
Sr-85	#A	-7.1217E-03	-7.1341E-03	2.5514E-02	2.5518E-02	2.862E-02
Kr-85	#A	-1.9821E+02	-1.9822E+02	8.2979E+02	8.2987E+02	6.672E+02
Y-88	#B	1.3322E-03	1.3336E-03	1.2286E-02	1.2286E-02	1.680E-02
NB-94	#B	3.9439E-03	3.9439E-03	1.6037E-02	1.6039E-02	1.870E-02
Ag-108M	#B	-5.8315E-05	-5.8315E-05	2.3529E-02	2.3529E-02	2.773E-02
CD-109	#A	-6.1758E-03	-6.1773E-03	1.6854E+00	1.6854E+00	8.914E-01

SN-113	#B	9.3105E-04	9.3196E-04	2.6425E-02	2.6425E-02	3.067E-02
SB-125	#B	-4.6235E-03	-4.6240E-03	1.2260E-01	1.2260E-01	5.761E-02
I-131	#B	6.9805E-03	7.0791E-03	1.2618E-02	1.2625E-02	1.357E-02
CS-134	#B	1.0179E-02	1.0180E-02	1.5790E-02	1.5802E-02	1.703E-02
CS-137	#A	-1.7798E-03	-1.7798E-03	1.3281E-01	1.3281E-01	2.627E-02
CE-139	#A	1.0412E-02	1.0421E-02	2.2539E-02	2.2547E-02	2.486E-02
EU-152	#B	-2.4178E-02	-2.4179E-02	7.7715E-02	7.7727E-02	8.551E-02
EU-154	#B	-1.5189E-03	-1.5190E-03	8.4497E-02	8.4497E-02	6.307E-02
EU-155	#B	2.2284E-02	2.2286E-02	9.7253E-02	9.7261E-02	1.081E-01
HG-203	#B	-1.8089E-03	-1.8133E-03	3.7448E-02	3.7448E-02	2.473E-02
TL-208	#	5.6692E-02	5.6692E-02	2.8906E-02	2.9099E-02	2.705E-02
PB-212	#	1.5400E-01	1.5400E-01	6.9476E-02	7.0069E-02	7.122E-02
PB-214	#	3.5707E-01	3.5707E-01	8.1971E-02	8.4641E-02	6.496E-02
BI-212	#B	9.3579E-02	9.3579E-02	1.9654E-01	1.9662E-01	2.184E-01
BI-214	#	3.7765E-01	3.7765E-01	8.1969E-02	8.4949E-02	
RA-224	#A	6.7557E-02	6.7557E-02	7.5574E-01	7.5575E-01	8.468E-01
RA-226	#	8.1219E-01	8.1219E-01	6.1945E-01	6.2130E-01	6.507E-01
AC-228	#	1.8552E-01	1.8552E-01	8.1150E-02	8.1886E-02	8.391E-02
TH-227	#	2.3858E-01	2.3858E-01	1.3541E-01	1.3614E-01	1.325E-01
PA-234	#B	-2.4500E-02	-2.4500E-02	9.3305E-02	9.3315E-02	1.039E-01
TH-234	#B	3.5486E-01	3.5486E-01	1.1396E+00	1.1398E+00	1.273E+00
AM-241	#A	-9.3667E-03	-9.3667E-03	1.8276E-01	1.8276E-01	1.672E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (50.2 to 2000.1 keV) 5.1336393E+00 pCi/gm
Total Decayed Activity (50.2 to 2000.1 keV) 5.1336393E+00 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JJM

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 107F_11SEPT2006_1144.An1

Sample description
FSS-OOL-05-10-012-F-A

Spectrum Filename: C:\GammaVision\Spectra\107F_11SEPT2006_1144.An1

Acquisition information
Start time: 11-Sep-2006 11:45:04
Live time: 2000
Real time: 2001
Dead time: 0.06 %
Detector ID: 2

Detector system
Det 107- DSPE- 634

Calibration
Filename: D7_1LSa.Clb
Detector 107 Calibration for 1 Liter Sand Marinelli

Energy Calibration
Created: 29-Oct-2004 06:48:53
Zero offset: 0.157 keV
Gain: 0.500 keV/channel
Quadratic: -1.676E-08 keV/channel^2

Efficiency Calibration
Created: 29-Oct-2004 06:51:32
Type: Polynomial
Uncertainty: 1.174 %
Coefficients: -0.279532 -4.778179 0.614896
-0.087174 0.005356 -0.000131

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.16keV)
Stop channel: 4000 (2000.15keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 1.3840E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.3840E+03) =
7.2254E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	09-Sep-2006 11:03:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	107_150K_28APR05.Pbc 01-May-2005 05:30:33
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 10 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.0149

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
76.31	410.	10.77	2.58	2.922E-02	72.87	6.400	2.337E+00	HG203
					74.81	9.600	1.449E+00	PB212
					77.11	10.700	1.250E+00	PB214
					77.11	17.500	7.733E-01	PB212
84.25	123.	24.44	1.10	3.220E-02				
92.55	150.	25.13	2.05	3.433E-02	92.38	2.570	1.571E+00	TH234
					92.80	3.000	1.231E+00	TH234
185.95	149.	21.34	1.83	3.610E-02	185.99	3.280	1.232E+00	RA226
239.49	452.	9.23	2.17	3.183E-02	238.63	43.100	3.102E-01	PB212
					241.00	3.900	3.555E+00	RA224
295.21	235.	10.38	2.53	2.768E-02				
295.21	235.	10.38	2.53	2.768E-02	295.22	19.200	4.235E-01	PB214
337.76	70.	30.64	1.04	2.504E-02				
337.76	70.	30.64	1.04	2.504E-02	338.40	12.010	2.175E-01	AC228
351.99	488.	5.99	2.47	2.426E-02	351.99	37.100	5.235E-01	PB214
511.08	4.	39.83	1.50	1.808E-02	510.72	22.500	PBC<MDA	TL208
582.94	133.	13.38	2.20	1.629E-02				
582.94	133.	13.38	2.20	1.629E-02	583.14	86.000	8.939E-02	TL208
609.19	351.	7.17	2.45	1.574E-02	609.32	46.090	4.671E-01	BI214
911.25	45.	23.76	1.76	1.161E-02	911.07	29.000	1.298E-01	AC228
968.60	28.	36.29	1.80	1.109E-02	968.90	17.460	PBC<MDA	AC228
1120.13	81.	14.82	1.59	9.970E-03	1120.28	15.040	5.295E-01	BI214
1460.59	399.	5.13	3.07	8.192E-03	1460.75	10.700	4.392E+00	K40
1764.54	73.	11.62	1.25	7.084E-03	1764.51	15.920	6.330E-01	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
152.30	76.31	737.	203.	0.102	60.44	2.585	BI-207	s
703.60	351.99	436.	162.	0.081	59.63	2.472	PB-214	s

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-212	151.93	76.13	760.	101.	0.051	114.97	1.500s
PB-214	153.89	77.11	715.	97.	0.048	115.02	1.500D
PB-212	153.89	77.11	710.	102.	0.051	115.02	1.500D
RA-226	371.55	185.95	310.	149.	0.075	64.01	1.834s
PB-212	476.81	238.59	394.	183.	0.091	46.76	1.500s
RA-224	477.13	238.75	331.	162.	0.081	52.52	1.500s
PB-214	590.06	295.22	214.	168.	0.084	42.32	1.500D
AC-228	676.05	338.22	146.	49.	0.025	105.37	1.500s
PB-214	703.59	351.99	148.	321.	0.160	22.79	1.500D
TL-208	1166.22	583.32	50.	88.	0.044	43.69	1.540s
BI-214	1217.96	609.19	69.	347.	0.174	21.52	2.448s
AC-228	1822.06	911.25	47.	45.	0.022	71.29	1.761s
AC-228	1936.76	968.60	48.	28.	0.014	108.87	1.799s
BI-214	2239.83	1120.13	24.	81.	0.041	44.45	1.589s
K-40	2920.77	1460.59	9.	394.	0.197	15.39	3.069s
BI-214	3528.74	1764.54	1.	73.	0.037	34.87	1.250s

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	MDA Value pCi/gm	COMMENTS
BE-7		-1.2042E-03					
			477.56	-1.204E-03	%(	2.056E-01 5.83E-02	G
K-40		4.3925E+00					
			1460.75	4.392E+00	*(P	1.836E-01 2.28E-01	G
MN-54		6.8133E-03					
			834.81	6.813E-03	&(P	2.139E-02 6.26E-03	G
CO-57		-4.5079E-03					
			122.07	-4.508E-03	%(P	2.809E-02 8.35E-03	G K
			136.43	-3.601E-02	& P	2.247E-01 6.68E-02	G
CO-60		-5.9573E-03					
			1332.51	-5.957E-03	%(P	2.867E-02 7.30E-03	G K
			1173.23	1.358E-03	% P	2.912E-02 7.82E-03	G K
Sr-85		-3.6065E-03					
			514.00	-3.606E-03	%(	2.860E-02 8.34E-03	G
Kr-85		-1.1918E+02					
			513.99	-1.192E+02	%(P	6.545E+02 1.88E+02	G
Y-88		-1.1799E-03					
			1836.01	-1.180E-03	%(P	3.351E-02 8.79E-03	G K
			898.02	1.164E-03	% P	2.185E-02 5.88E-03	G
NB-94		6.9957E-03					
			871.10	6.996E-03	%(P	2.309E-02 6.76E-03	G K
			702.50	3.390E-03	& P	2.079E-02 5.92E-03	G K
Ag-108M		0.0000E+00					
			722.95	0.000E+00	&(	3.472E-02 9.89E-03	G K
			614.37	-2.473E-02	&	4.013E-02 1.23E-02	G
			433.93	1.014E-03	% P	2.099E-02 5.94E-03	G
CD-109		-1.1955E-01					
			88.04	-1.196E-01	%(P	9.494E-01 2.83E-01	G
SN-113		8.4260E-03					
			391.71	8.426E-03	%(P	3.005E-02 8.84E-03	G K
			255.04	2.008E-02	%	9.419E-01 2.74E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	-1.2983E-02						
		427.95	-1.298E-02	%(P	6.372E-02	1.83E-02	G K
		600.77	-2.501E-02	% P	1.104E-01	3.14E-02	G
		636.15	-8.197E-04	% P	1.892E-01	5.25E-02	G
		463.51	7.476E-02	% P	1.874E-01	5.56E-02	G
		176.29	9.644E-02	% P	3.303E-01	9.87E-02	G
I-131	-6.4353E-03						
		364.48	-6.435E-03	%(	2.823E-02	8.31E-03	G K
		636.97	5.019E-02	&	3.359E-01	9.61E-02	G
		284.29	5.748E-02	&	4.100E-01	1.21E-01	G
CS-134	2.4613E-03						
		604.66	2.461E-03	%(P	6.687E-02	1.98E-02	G K
		795.76	-4.715E-04	& P	3.162E-02	8.81E-03	G
		569.29	1.719E-03	&	1.137E-01	3.15E-02	G
		801.84	4.026E-03	& P	2.602E-01	7.18E-02	G
CS-137	-4.6371E-03						
		661.62	-4.637E-03	%(P	2.439E-02	6.55E-03	G
CE-139	2.3835E-04						
		165.85	2.384E-04	%(P	2.906E-02	8.55E-03	G
EU-152	1.7545E-03						
		121.78	1.754E-03	%(P	8.434E-02	2.49E-02	G K
		344.30	-1.123E-02	% P	7.930E-02	2.31E-02	G
		1408.08	5.048E-02	% P	1.033E-01	3.12E-02	G
		964.00	-3.249E-02	& P	2.518E-01	7.27E-02	G
		1112.07	-2.048E-02	% P	2.008E-01	5.57E-02	G
		778.90	-1.547E-02	% P	1.626E-01	4.50E-02	G
EU-154	-6.5947E-03						
		123.10	-6.595E-03	%(P	5.676E-02	1.68E-02	G K
		1274.80	-1.017E-03	% P	9.476E-02	2.61E-02	G
		723.30	-3.675E-02	& P	1.340E-01	3.92E-02	G
		1004.80	-2.538E-03	% P	1.252E-01	3.37E-02	G
EU-155	4.1406E-03						
		86.45	4.141E-03	&(	1.075E-01	3.19E-02	G K
		105.31	-1.009E-02	% P	1.267E-01	3.76E-02	G
HG-203	-4.7079E-03						
		279.17	-4.708E-03	%(P	2.621E-02	7.69E-03	G K
		72.87	3.727E-01	& P	7.084E-01	2.15E-01	G
		70.83	-6.626E-01	%	1.313E+00	3.99E-01	G
		82.50	-8.091E-01	%	1.624E+00	4.93E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	6.1621E-02						
		583.14	6.162E-02	*(P	2.479E-02	9.44E-03	G
		510.72	9.481E-03	% P	1.326E-01	3.59E-02	G
PB-212	1.4764E-01						
		238.63	1.296E-01	*(P	6.763E-02	2.19E-02	G K
							Energy duplication
		77.11	1.920E-01	*(	2.394E-01	7.36E-02	G
		74.81	3.607E-01	+ P	4.681E-01	1.44E-01	G
PB-214	3.2876E-01						
							Energy duplication
		351.99	3.479E-01	*(P	6.452E-02	2.68E-02	G K
							Energy duplication
		295.22	3.082E-01	*(P	1.301E-01	4.46E-02	G
							Energy duplication
		77.11	2.993E-01	*(P	3.928E-01	1.20E-01	G
		241.92	8.479E-02	& P	4.304E-01	1.28E-01	G
BI-212	9.5981E-02						
		727.17	9.598E-02	%(P	1.780E-01	5.42E-02	G K
		1620.56	1.320E-01	% P	7.855E-01	2.12E-01	G
		785.42	-4.759E-02	% P	1.229E+00	3.37E-01	G
BI-214	4.8243E-01						
		609.32	4.671E-01	*(P	5.571E-02	3.39E-02	G K
		1764.51	6.330E-01	+ P	6.381E-02	7.45E-02	G
		1120.28	5.295E-01	*(P	1.653E-01	7.93E-02	G
RA-224	1.2754E+00						
		241.00	1.275E+00	&(P	6.911E-01	2.26E-01	G
RA-226	1.2319E+00						
		185.99	1.232E+00	*(	6.985E-01	2.63E-01	G
AC-228	1.3944E-01						
		911.07	1.298E-01	*(P	1.010E-01	3.38E-02	G K
		968.90	1.414E-01	*(P	1.756E-01	5.54E-02	G
		338.40	1.598E-01	*(P	1.921E-01	5.98E-02	G
TH-227	-1.4062E-01						
		236.00	-1.406E-01	%(P	2.592E-01	7.89E-02	G K
		256.25	4.676E-03	& P	3.045E-01	8.84E-02	G
PA-234	-3.3304E-02						
		98.44	-3.330E-02	&(	1.062E-01	3.19E-02	G K
		946.00	2.319E-02	%	1.137E-01	3.25E-02	G
		131.28	-1.226E-02	&	1.263E-01	3.75E-02	G
		94.67	-6.301E-02	%	1.891E-01	5.69E-02	G
		883.24	-3.654E-02	%	2.276E-01	6.54E-02	G

926.70 6.080E-02 & 1.833E-01 5.38E-02 G

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 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26 3.243E-02 &   1.767E-01 5.08E-02 G

TH-234       2.6217E-01
                           63.29 2.622E-01 %(P 1.327E+00 3.94E-01 G K
                           92.80 6.785E-01 % P 1.035E+00 3.14E-01 G
                           92.38 8.956E-01 % P 1.249E+00 3.82E-01 G

AM-241      -6.6627E-03
                           59.54-6.663E-03 &(P 1.744E-01 5.16E-02 G
   ( - This peak used in the nuclide activity average.

   * - Peak is too wide, but only one peak in library.
   ! - Peak is part of a multiplet and this area went
       negative during deconvolution.
   ? - Peak is too narrow.
   @ - Peak is too wide at FW25M, but ok at FWHM.
   % - Peak fails sensitivity test.
   $ - Peak identified, but first peak of this nuclide
       failed one or more qualification tests.
   + - Peak activity higher than counting uncertainty range.
   - - Peak activity lower than counting uncertainty range.
   = - Peak outside analysis energy range.
   & - Calculated peak centroid is not close enough to the
       library energy centroid for positive identification.
   P - Peakbackground subtraction
   } - Peak is too close to another for the activity
       to be found directly.

   Nuclide Codes:                      Peak Codes:
   T - Thermal Neutron Activation      G - Gamma Ray
   F - Fast Neutron Activation         X - X-Ray
   I - Fission Product                 P - Positron Decay
   N - Naturally Occurring Isotope     S - Single-Escape
   P - Photon Reaction                 D - Double-Escape
   C - Charged Particle Reaction       K - Key Line
   M - No MDA Calculation              A - Not in Average
   R - Coincidence Corrected           C - Coincidence Peak
   H - Halflife limit exceeded

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
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***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	-1.1729E-03	-1.2042E-03	1.7476E-01	1.7476E-01	2.003E-01
K-40	#	4.3925E+00	4.3925E+00	6.8414E-01	7.3167E-01	
MN-54	#A	6.7827E-03	6.8133E-03	1.8787E-02	1.8791E-02	2.129E-02
CO-57	#B	-4.4845E-03	-4.5079E-03	2.6004E-02	2.6005E-02	2.794E-02
CO-60	#B	-5.9530E-03	-5.9573E-03	1.2575E-01	1.2576E-01	2.865E-02

Sr-85	#A	-3.5291E-03	-3.6065E-03	2.5026E-02	2.5027E-02	2.799E-02
Kr-85	#A	-1.1918E+02	-1.1918E+02	1.0898E+03	1.0898E+03	6.545E+02
Y-88	#B	-1.1645E-03	-1.1799E-03	4.2871E-02	4.2871E-02	3.307E-02
NB-94	#B	6.9957E-03	6.9957E-03	2.0294E-02	2.0298E-02	2.309E-02
Ag-108M	#B	0.0000E+00	0.0000E+00	2.9679E-02	2.9679E-02	3.472E-02
CD-109	#A	-1.1918E-01	-1.1955E-01	8.8589E-01	8.8592E-01	9.464E-01
SN-113	#B	8.3237E-03	8.4260E-03	2.6511E-02	2.6516E-02	2.969E-02
SB-125	#B	-1.2965E-02	-1.2983E-02	7.7669E-02	7.7672E-02	6.363E-02
I-131	#B	-5.4025E-03	-6.4353E-03	2.4921E-02	2.4924E-02	2.370E-02
CS-134	#B	2.4567E-03	2.4613E-03	5.9417E-02	5.9417E-02	6.674E-02
CS-137	#A	-4.6365E-03	-4.6371E-03	7.7372E-02	7.7373E-02	2.439E-02
CE-139	#A	2.3593E-04	2.3835E-04	2.5652E-02	2.5652E-02	2.877E-02
EU-152	#B	1.7539E-03	1.7545E-03	7.4700E-02	7.4700E-02	8.432E-02
EU-154	#B	-6.5917E-03	-6.5947E-03	5.5968E-02	5.5969E-02	5.673E-02
EU-155	#B	4.1374E-03	4.1406E-03	9.5823E-02	9.5823E-02	1.074E-01
HG-203	#B	-4.5679E-03	-4.7079E-03	2.9230E-02	2.9231E-02	2.543E-02
TL-208	#	6.1621E-02	6.1621E-02	2.8307E-02	2.8540E-02	2.479E-02
PB-212	#	1.4764E-01	1.4764E-01	7.4984E-02	7.5489E-02	6.763E-02
PB-214	#	3.2876E-01	3.2876E-01	7.6103E-02	7.8541E-02	6.452E-02
BI-212	#B	9.5981E-02	9.5981E-02	1.6266E-01	1.6276E-01	1.780E-01
BI-214		4.8243E-01	4.8243E-01	1.0513E-01	1.0893E-01	
RA-224	#	1.2754E+00	1.2754E+00	6.7910E-01	6.8327E-01	6.911E-01
RA-226	#	1.2319E+00	1.2319E+00	7.8861E-01	7.9196E-01	
AC-228	#	1.3944E-01	1.3944E-01	8.3819E-02	8.4223E-02	1.010E-01
TH-227	#B	-1.4062E-01	-1.4062E-01	2.3910E-01	2.3924E-01	2.592E-01
PA-234	#B	-3.3304E-02	-3.3304E-02	9.5721E-02	9.5739E-02	1.062E-01
TH-234	#B	2.6217E-01	2.6217E-01	1.1807E+00	1.1808E+00	1.327E+00
AM-241	#A	-6.6627E-03	-6.6627E-03	2.1408E-01	2.1408E-01	1.744E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (50.2 to 2000.1 keV) 6.1068134E+00 pCi/gm
Total Decayed Activity (50.2 to 2000.1 keV) 6.1068163E+00 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JPK

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 107F_11SEPT2006_1525.An1

Sample description
OOL-05-10-014-F-A

Spectrum Filename: C:\GammaVision\Spectra\107F_11SEPT2006_1525.An1

Acquisition information

Start time:	11-Sep-2006 15:25:11
Live time:	2000
Real time:	2002
Dead time:	0.12 %
Detector ID:	2

Detector system
Det 107- DSPE- 634

Calibration

Filename:	D7_1LSa.Clb

Detector 107 Calibration for 1 Liter Sand Marinelli

Energy Calibration

Created:	29-Oct-2004 06:48:53
Zero offset:	0.157 keV
Gain:	0.500 keV/channel
Quadratic:	-1.676E-08 keV/channel^2

Efficiency Calibration

Created:	29-Oct-2004 06:51:32
Type:	Polynomial
Uncertainty:	1.174 %
Coefficients:	-0.279532 -4.778179 0.614896
	-0.087174 0.005356 -0.000131

Library Files

Main analysis library:	FSS_Rev_1.Lib
Library Match Width:	1.000
Peak stripping:	Library based

Analysis parameters

Analysis engine:	Env32 G53W4.20
Start channel:	100 (50.16keV)
Stop channel:	4000 (2000.15keV)
Peak rejection level:	41.667%
Peak search sensitivity:	3
Sample Size:	1.4020E+03
Activity scaling factor:	1.0000E+06/(1.0000E+00* 1.4020E+03) = 7.1327E+02
Detection limit method:	Nureg 4.16
Random error:	1.0000000E+00
Systematic error:	1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

YAEC Chemistry Lab Spectrum name: 107F_11SEPT2006_1525.An1

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	09-Sep-2006 11:45:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	107_150K_28APR05.Pbc 01-May-2005 05:30:33
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 11 cutoff 20.00000 %

Energy Calibration
Normalized diff: 1.0000

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
57.97	77.	34.86	0.67	1.502E-02				
74.81	143.	31.61	1.50	2.849E-02	72.87	6.400	PBC<MDA	HG203
					74.81	9.600	PBC<MDA	PB212
76.90	224.	19.13	1.50	2.957E-02				
76.90	224.	19.13	1.50	2.957E-02	77.11	10.700	6.809E-01	PB214
					77.11	17.500	PBC<MDA	PB212
76.90	228.	19.13	1.50	2.957E-02				
76.90	228.	19.13	1.50	2.957E-02	77.11	10.700	6.809E-01	PB214
					77.11	17.500	4.252E-01	PB212
92.75	130.	32.06	1.01	3.437E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
					94.67	15.500	2.316E-01	PA234
185.77	106.	28.04	1.49	3.612E-02				
185.77	106.	28.04	1.49	3.612E-02	185.99	3.280	8.628E-01	RA226
238.62	271.	9.93	1.30	3.189E-02	238.63	43.100	1.787E-01	PB212
242.17	121.	18.45	1.30	3.161E-02	241.00	3.900	9.244E-01	RA224
					241.92	7.470	4.870E-01	PB214
295.13	284.	10.05	1.47	2.768E-02				
295.13	284.	10.05	1.47	2.768E-02	295.22	19.200	5.060E-01	PB214
338.53	84.	23.76	1.55	2.500E-02	338.40	12.010	2.609E-01	AC228
351.95	530.	6.68	1.89	2.426E-02				
351.95	530.	6.68	1.89	2.426E-02	351.99	37.100	5.626E-01	PB214
511.37	106.	19.18	1.78	1.806E-02	510.72	22.500	1.719E-01	TL208
583.13	128.	13.26	2.35	1.629E-02				
583.13	128.	13.26	2.35	1.629E-02	583.14	86.000	8.487E-02	TL208
609.34	390.	5.99	1.89	1.574E-02	609.32	46.090	5.126E-01	BI214
911.18	92.	17.50	1.62	1.161E-02	911.07	29.000	2.527E-01	AC228

967.29	74.	16.56	1.49	1.109E-02	968.90	17.460	3.700E-01	AC228
1120.21	118.	13.10	1.77	9.970E-03	1120.28	15.040	7.541E-01	BI214
1237.86	56.	27.82	1.91	9.264E-03				
1460.61	371.	5.43	2.50	8.192E-03	1460.75	10.700	4.028E+00	K40
1764.35	93.	11.09	2.18	7.084E-03	1764.51	15.920	7.932E-01	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
476.88	238.64	225.	271.	0.135	29.78	1.297	PB-212	D
483.98	242.19	188.	121.	0.060	55.36	1.299	PB-214	D
1022.34	511.37	138.	54.	0.027	100.07	1.776	RH-106M	s
2475.29	1237.86	46.	56.	0.028	83.47	1.913	BI-214	s

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-212	149.29	74.81	1002.	143.	0.071	94.84	1.500s
PB-214	153.89	77.11	844.	224.	0.112	57.38	1.500D
PB-212	153.89	77.11	839.	228.	0.114	57.38	1.500D
PA-234	184.98	92.66	538.	113.	0.057	91.21	1.500s
RA-226	371.49	185.92	442.	112.	0.056	84.53	1.500
PB-212	476.89	238.63	548.	221.	0.111	45.70	1.500D
PB-214	590.13	295.25	223.	256.	0.128	30.43	1.500s
AC-228	676.67	338.53	131.	81.	0.041	71.29	1.554s
PB-214	703.55	351.97	183.	452.	0.226	18.73	1.500s
TL-208	1022.03	511.22	101.	35.	0.018	61.99	1.500s
TL-208	1165.99	583.20	51.	98.	0.049	40.94	1.540s
BI-214	1218.25	609.34	60.	386.	0.193	17.97	1.889s
AC-228	1821.92	911.18	48.	88.	0.044	52.51	1.615s
AC-228	1934.15	967.29	26.	74.	0.037	49.67	1.487s
BI-214	2239.99	1120.21	35.	117.	0.059	39.31	1.772s
K-40	2920.82	1460.61	16.	366.	0.183	16.30	2.505s
BI-214	3528.36	1764.35	4.	93.	0.046	33.26	2.183s

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	MDA Value pCi/gm	COMMENTS
BE-7		-5.1704E-02					
			477.56	-5.170E-02	&(	2.049E-01 6.02E-02	G
K-40		4.0281E+00					
			1460.75	4.028E+00	*(P	2.331E-01 2.22E-01	G
MN-54		5.7608E-03					
			834.81	5.761E-03	&(P	2.312E-02 6.70E-03	G
CO-57		-4.3294E-03					
			122.07	-4.329E-03	%(P	3.347E-02 9.97E-03	G K
			136.43	-6.801E-02	% P	2.268E-01 6.81E-02	G
CO-60		-1.2794E-03					
			1332.51	-1.279E-03	%(P	2.342E-02 5.70E-03	G K
			1173.23	1.244E-03	% P	2.948E-02 7.94E-03	G K
Sr-85		-9.5980E-03					
			514.00	-9.598E-03	&(	3.034E-02 9.05E-03	G
Kr-85		-2.5361E+02					
			513.99	-2.536E+02	&(P	6.921E+02 2.04E+02	G
Y-88		-5.1863E-03					
			1836.01	-5.186E-03	%(P	2.598E-02 6.89E-03	G K
			898.02	-1.371E-03	% P	3.437E-02 9.58E-03	G
NB-94		-1.7949E-03					
			871.10	-1.795E-03	%(P	2.415E-02 6.76E-03	G K
			702.50	-3.208E-03	% P	2.273E-02 6.45E-03	G K
Ag-108M		1.1067E-02					
			722.95	1.107E-02	&(	2.297E-02 6.98E-03	G K
			614.37	-2.142E-02	&	3.980E-02 1.21E-02	G
			433.93	-6.498E-03	% P	2.692E-02 7.87E-03	G
CD-109		7.3581E-02					
			88.04	7.358E-02	%(P	8.484E-01 2.52E-01	G
SN-113		-2.2340E-03					
			391.71	-2.234E-03	%(P	3.724E-02 1.07E-02	G K
			255.04	1.688E-01	&	1.143E+00 3.38E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	1.9479E-02						
		427.95	1.948E-02	&(P	7.111E-02	2.09E-02	G K
		600.77	1.366E-02	% P	1.270E-01	3.63E-02	G
		636.15	-2.339E-02	& P	1.776E-01	5.00E-02	G
		463.51	-2.667E-02	% P	2.323E-01	6.59E-02	G
		176.29	-7.837E-03	% P	3.718E-01	1.09E-01	G
I-131	5.3787E-03						
		364.48	5.379E-03	&(	2.838E-02	8.31E-03	G K
		636.97	-5.627E-03	%	2.893E-01	7.95E-02	G
		284.29	-8.367E-02	%	4.514E-01	1.34E-01	G
CS-134	-1.7060E-03						
		604.66	-1.706E-03	%(P	8.269E-02	2.46E-02	G K
		795.76	9.511E-03	% P	2.677E-02	7.92E-03	G
		569.29	2.745E-02	&	1.516E-01	4.41E-02	G
		801.84	2.972E-03	% P	2.549E-01	7.03E-02	G
CS-137	5.4074E-03						
		661.62	5.407E-03	%(P	2.557E-02	7.27E-03	G
CE-139	-2.7331E-03						
		165.85	-2.733E-03	%(P	3.336E-02	9.90E-03	G
EU-152	-9.9050E-03						
		121.78	-9.905E-03	%(P	9.667E-02	2.88E-02	G K
		344.30	5.702E-04	% P	9.281E-02	2.70E-02	G
		1408.08	2.147E-02	% P	1.124E-01	3.12E-02	G
		964.00	4.546E-02	& P	2.319E-01	6.75E-02	G
		1112.07	2.758E-02	& P	1.789E-01	5.02E-02	G
		778.90	-1.257E-02	% P	1.779E-01	4.95E-02	G
EU-154	1.2240E-02						
		123.10	1.224E-02	%(P	7.028E-02	2.10E-02	G K
		1274.80	-1.004E-03	& P	1.074E-01	3.00E-02	G
		723.30	-4.219E-02	& P	1.653E-01	4.86E-02	G
		1004.80	4.174E-02	% P	1.398E-01	4.09E-02	G
EU-155	4.2072E-02						
		86.45	4.207E-02	%(	1.218E-01	3.68E-02	G K
		105.31	3.922E-02	% P	1.365E-01	4.10E-02	G
HG-203	-4.1069E-04						
		279.17	-4.107E-04	&(P	2.668E-02	7.72E-03	G K
		72.87	-5.018E-01	& P	9.486E-01	2.88E-01	G
		70.83	-9.618E-01	&	1.551E+00	4.73E-01	G
		82.50	-1.050E-01	&	1.883E+00	5.61E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	7.0956E-02						
		583.14	6.753E-02	*(P	2.485E-02	9.64E-03	G
		510.72	8.407E-02	*(P	1.175E-01	3.38E-02	G
PB-212	1.5499E-01						
							Energy duplication
		238.63	1.550E-01	*(P	7.838E-02	2.53E-02	G K
							Energy duplication
		77.11	4.252E-01	+	2.564E-01	8.13E-02	G
		74.81	5.022E-01	& P	5.292E-01	1.63E-01	G
PB-214	4.7698E-01						
		351.99	4.837E-01	*(P	7.047E-02	3.05E-02	G K
		295.22	4.639E-01	*(P	1.311E-01	4.79E-02	G
							Energy duplication
		77.11	6.809E-01	+ P	4.206E-01	1.33E-01	G
		241.92	2.079E-01	& P	4.836E-01	1.46E-01	G
BI-212	1.2322E-01						
		727.17	1.232E-01	%(P	2.143E-01	6.56E-02	G K
		1620.56	-2.326E-02	% P	3.413E-01	4.63E-02	G
		785.42	3.777E-02	% P	1.078E+00	2.96E-01	G
BI-214	5.1262E-01						
		609.32	5.126E-01	*(P	5.161E-02	3.11E-02	G K
		1764.51	7.932E-01	+ P	1.048E-01	8.88E-02	G
		1120.28	7.541E-01	+ P	1.938E-01	9.96E-02	G
RA-224	5.1040E-01						
		241.00	5.104E-01	%(P	9.149E-01	2.78E-01	G
RA-226	9.1120E-01						
		185.99	9.112E-01	(	8.191E-01	2.57E-01	G
AC-228	2.8944E-01						
		911.07	2.527E-01	*(P	9.995E-02	4.64E-02	G K
		968.90	3.700E-01	@(P	1.309E-01	6.30E-02	G
		338.40	2.609E-01	*(P	1.797E-01	6.45E-02	G
TH-227	-1.3057E-01						
		236.00	-1.306E-01	%(P	2.977E-01	9.01E-02	G K
		256.25	4.117E-03	& P	2.914E-01	8.45E-02	G
PA-234	6.9834E-02						
		98.44	-1.235E-02	&(	1.241E-01	3.70E-02	G K
		946.00	-3.672E-03	%	1.106E-01	3.03E-02	G
		131.28	4.026E-03	&	1.460E-01	4.33E-02	G
		94.67	2.029E-01	?(	1.982E-01	6.17E-02	G
		883.24	7.405E-02	%	1.769E-01	5.31E-02	G
		926.70	-3.980E-02	&	2.502E-01	7.18E-02	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26 4.626E-02 &   2.229E-01 6.51E-02 G

TH-234       2.7526E-01
                           63.29 2.753E-01 %(P 1.621E+00 4.83E-01 G K
                           92.80 8.109E-01 % P 1.259E+00 3.82E-01 G
                           92.38 1.074E+00 % P 1.478E+00 4.52E-01 G

AM-241      -7.3658E-02
                           59.54-7.366E-02 &(P 2.184E-01 6.58E-02 G
   ( - This peak used in the nuclide activity average.

   * - Peak is too wide, but only one peak in library.
   ! - Peak is part of a multiplet and this area went
       negative during deconvolution.
   ? - Peak is too narrow.
   @ - Peak is too wide at FW25M, but ok at FWHM.
   % - Peak fails sensitivity test.
   $ - Peak identified, but first peak of this nuclide
       failed one or more qualification tests.
   + - Peak activity higher than counting uncertainty range.
   - - Peak activity lower than counting uncertainty range.
   = - Peak outside analysis energy range.
   & - Calculated peak centroid is not close enough to the
       library energy centroid for positive identification.
   P - Peakbackground subtraction
   } - Peak is too close to another for the activity
       to be found directly.

   Nuclide Codes:                      Peak Codes:
   T - Thermal Neutron Activation      G - Gamma Ray
   F - Fast Neutron Activation         X - X-Ray
   I - Fission Product                 P - Positron Decay
   N - Naturally Occurring Isotope     S - Single-Escape
   P - Photon Reaction                 D - Double-Escape
   C - Charged Particle Reaction       K - Key Line
   M - No MDA Calculation              A - Not in Average
   R - Coincidence Corrected           C - Coincidence Peak
   H - Halflife limit exceeded

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
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***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	-5.0279E-02	-5.1704E-02	1.8072E-01	1.8075E-01	1.993E-01
K-40	#	4.0281E+00	4.0281E+00	6.6496E-01	7.0623E-01	
MN-54	#A	5.7333E-03	5.7608E-03	2.0090E-02	2.0093E-02	2.301E-02
CO-57	#B	-4.3056E-03	-4.3294E-03	3.1079E-02	3.1080E-02	3.328E-02
CO-60	#B	-1.2784E-03	-1.2794E-03	3.2424E-02	3.2424E-02	2.340E-02

Sr-85	#A	-9.3796E-03	-9.5980E-03	2.7149E-02	2.7155E-02	2.965E-02
Kr-85	#A	-2.5361E+02	-2.5361E+02	8.2355E+02	8.2368E+02	6.921E+02
Y-88	#B	-5.1142E-03	-5.1863E-03	3.2633E-02	3.2634E-02	2.562E-02
NB-94	#B	-1.7949E-03	-1.7949E-03	2.2895E-02	2.2896E-02	2.415E-02
Ag-108M	#B	1.1066E-02	1.1067E-02	2.0936E-02	2.0946E-02	2.297E-02
CD-109	#A	7.3339E-02	7.3581E-02	7.5677E-01	7.5678E-01	8.456E-01
SN-113	#B	-2.2052E-03	-2.2340E-03	1.1161E-01	1.1161E-01	3.676E-02
SB-125	#B	1.9450E-02	1.9479E-02	6.2841E-02	6.2851E-02	7.100E-02
I-131	#B	4.4676E-03	5.3787E-03	2.4938E-02	2.4940E-02	2.357E-02
CS-134	#B	-1.7026E-03	-1.7060E-03	1.0880E-01	1.0880E-01	8.253E-02
CS-137	#A	5.4067E-03	5.4074E-03	2.1806E-02	2.1808E-02	2.556E-02
CE-139	#A	-2.7036E-03	-2.7331E-03	3.2208E-02	3.2208E-02	3.300E-02
EU-152	#B	-9.9019E-03	-9.9050E-03	8.8415E-02	8.8416E-02	9.663E-02
EU-154	#B	1.2234E-02	1.2240E-02	6.2969E-02	6.2973E-02	7.024E-02
EU-155	#B	4.2038E-02	4.2072E-02	1.1027E-01	1.1029E-01	1.217E-01
HG-203	#B	-3.9774E-04	-4.1069E-04	1.6050E-01	1.6050E-01	2.584E-02
TL-208	#	7.0956E-02	7.0956E-02	3.0393E-02	3.0681E-02	2.485E-02
PB-212	#	1.5499E-01	1.5499E-01	7.5877E-02	7.6427E-02	7.838E-02
PB-214	#	4.7698E-01	4.7698E-01	8.6566E-02	9.1034E-02	7.047E-02
BI-212	#B	1.2322E-01	1.2322E-01	1.9686E-01	1.9699E-01	2.143E-01
BI-214	#	5.1262E-01	5.1262E-01	9.3164E-02	9.7960E-02	
RA-224	#A	5.1040E-01	5.1040E-01	8.3472E-01	8.3527E-01	9.149E-01
RA-226	#	9.1119E-01	9.1120E-01	7.7027E-01	7.7215E-01	8.191E-01
AC-228	#	2.8944E-01	2.8944E-01	1.0183E-01	1.0326E-01	
TH-227	#B	-1.3057E-01	-1.3057E-01	2.7324E-01	2.7334E-01	2.977E-01
PA-234	#B	6.9834E-02	6.9834E-02	6.3692E-02	6.3810E-02	1.241E-01
TH-234	#B	2.7526E-01	2.7526E-01	1.4490E+00	1.4491E+00	1.621E+00
AM-241	#A	-7.3657E-02	-7.3658E-02	2.0315E-01	2.0319E-01	2.184E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (294.7 to 2000.1 keV) 4.8301959E+00 pCi/gm
Total Decayed Activity (294.7 to 2000.1 keV) 4.8301959E+00 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JPK

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 107F_12SEP2006_1417.An1

Sample description
FSS-OOL-05-10-015-F

Spectrum Filename: C:\GammaVision\Spectra\107F_12SEP2006_1417.An1

Acquisition information

Start time:	12-Sep-2006 14:17:29
Live time:	2000
Real time:	2003
Dead time:	0.12 %
Detector ID:	2

Detector system
Det 107- DSPE- 634

Calibration

Filename:	D7_1LSa.Clb

Detector 107 Calibration for 1 Liter Sand Marinelli

Energy Calibration

Created:	29-Oct-2004 06:48:53
Zero offset:	0.157 keV
Gain:	0.500 keV/channel
Quadratic:	-1.676E-08 keV/channel^2

Efficiency Calibration

Created:	29-Oct-2004 06:51:32
Type:	Polynomial
Uncertainty:	1.174 %
Coefficients:	-0.279532 -4.778179 0.614896
	-0.087174 0.005356 -0.000131

Library Files

Main analysis library:	FSS_Rev_1.Lib
Library Match Width:	1.000
Peak stripping:	Library based

Analysis parameters

Analysis engine:	Env32 G53W4.20
Start channel:	100 (50.16keV)
Stop channel:	4000 (2000.15keV)
Peak rejection level:	41.667%
Peak search sensitivity:	3
Sample Size:	2.0200E+03
Activity scaling factor:	1.0000E+06/(1.0000E+00* 2.0200E+03) = 4.9505E+02
Detection limit method:	Nureg 4.16
Random error:	1.0000000E+00
Systematic error:	1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	09-Sep-2006 12:00:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	107_150K_28APR05.Pbc 01-May-2005 05:30:33
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 16 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.1370

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
74.62	241.	16.38	1.18	2.849E-02	74.81	9.600	5.889E-01	PB212
76.84	166.	27.56	1.50	2.957E-02	77.11	17.500	PBC<MDA	PB212
					77.11	10.700	PBC<MDA	PB214
76.92	180.	21.27	1.18	2.957E-02	77.11	17.500	4.567E-01	PB212
					77.11	10.700	7.368E-01	PB214
86.73	135.	39.13	1.23	3.292E-02	86.45	32.740	8.410E-02	EU155
92.48	154.	32.04	1.43	3.432E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
					94.67	15.500	1.912E-01	PA234
186.01	208.	22.42	1.77	3.610E-02	185.99	3.280	1.172E+00	RA226
239.25	1394.	4.53	2.19	3.185E-02	238.63	43.100	6.706E-01	PB212
					241.00	3.900	7.529E+00	RA224
242.06	181.	19.38	1.30	3.163E-02	241.00	3.900	9.818E-01	RA224
					241.92	7.470	5.138E-01	PB214
270.69	127.	26.34	0.98	2.941E-02				
295.28	217.	11.63	1.34	2.767E-02	295.22	19.200	2.671E-01	PB214
300.36	73.	26.80	1.34	2.733E-02				
338.67	240.	13.67	1.82	2.499E-02	338.40	12.010	5.279E-01	AC228
351.90	549.	6.65	2.03	2.426E-02	351.99	37.100	4.040E-01	PB214
511.34	188.	14.72	3.25	1.806E-02	510.72	22.500	2.538E-01	TL208
					513.99	0.004	1.600E+03	Kr85
					514.00	99.270	7.280E-02	Sr85
583.28	381.	9.56	2.40	1.629E-02	583.14	86.000	1.798E-01	TL208
609.68	382.	8.60	2.11	1.573E-02	609.32	46.090	3.482E-01	BI214
727.61	114.	18.15	3.09	1.374E-02	727.17	11.800	4.712E-01	BI212
795.06	51.	25.64	0.81	1.285E-02				
795.06	51.	25.64	0.81	1.285E-02	795.76	85.400	3.088E-02	CS134

911.50	329.	8.54	2.07	1.160E-02	911.07	29.000	6.454E-01	AC228
968.31	210.	12.89	1.94	1.110E-02	968.90	17.460	7.159E-01	AC228

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
1120.54	139.	15.92	1.95	9.968E-03	1120.28	15.040	6.153E-01	BI214
1461.09	1178.	3.02	2.85	8.190E-03	1460.75	10.700	8.957E+00	K40
1765.00	76.	12.96	2.05	7.084E-03	1764.51	15.920	4.521E-01	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
173.13	86.73	1062.	135.	0.068	117.38	1.231	BI-207	l
184.63	92.48	912.	154.	0.077	96.11	1.429	PB-214	l
541.00	270.69	342.	127.	0.064	79.01	0.981	AC-228	s
600.33	300.40	155.	73.	0.037	80.41	1.341	PB-212	lD

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-212	149.29	74.81	684.	241.	0.120	49.13	1.178D
PB-212	153.89	77.11	707.	180.	0.090	63.82	1.179A
PB-214	153.89	77.11	1185.	166.	0.083	82.69	1.500A
RA-226	371.37	185.86	661.	115.	0.057	98.99	1.500s
PB-212	476.89	238.63	504.	792.	0.396	15.69	1.297D
PB-214	483.47	241.92	539.	181.	0.091	58.15	1.299D
PB-214	590.27	295.33	329.	242.	0.121	40.82	2.198s
AC-228	676.83	338.61	331.	263.	0.132	43.78	1.838s
PB-214	703.42	351.90	236.	543.	0.272	19.96	2.030s
TL-208	1022.27	511.34	199.	154.	0.077	44.15	3.248s
TL-208	1166.15	583.28	215.	376.	0.188	28.67	2.403s
BI-214	1218.94	609.68	178.	378.	0.189	25.79	2.111s
BI-212	1454.80	727.61	94.	114.	0.057	54.44	3.090s
CS-134	1590.06	795.25	62.	37.	0.018	101.74	1.684s
AC-228	1822.56	911.50	96.	325.	0.162	25.61	2.073s
AC-228	1935.42	967.93	84.	191.	0.096	33.66	1.928s
BI-214	2240.65	1120.54	84.	138.	0.069	47.76	1.945
K-40	2921.77	1461.09	25.	1173.	0.587	9.05	2.846s
BI-214	3529.65	1765.00	8.	76.	0.038	38.89	2.051s

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	MDA Value pCi/gm	COMMENTS
BE-7		2.0711E-02					
			477.56	2.071E-02	&(	1.832E-01 5.34E-02	G
K-40		8.9572E+00					
			1460.75	8.957E+00	*(P	1.969E-01 2.71E-01	G
MN-54		4.2692E-04					
			834.81	4.269E-04	&(P	2.925E-02 8.44E-03	G
CO-57		-3.3895E-03					
			122.07	-3.389E-03	%(P	2.954E-02 8.83E-03	G K
			136.43	-3.966E-02	% P	2.326E-01 6.97E-02	G
CO-60		-2.5291E-03					
			1332.51	-2.529E-03	%(P	2.232E-02 5.80E-03	G K
			1173.23	-6.181E-03	& P	3.023E-02 8.50E-03	G K
Sr-85		-1.0821E-02					
			514.00	-1.082E-02	%(	3.022E-02 9.09E-03	G
Kr-85		-2.6756E+02					
			513.99	-2.676E+02	%(P	6.787E+02 2.03E+02	G
Y-88		-3.7048E-03					
			1836.01	-3.705E-03	&(P	2.163E-02 5.85E-03	G K
			898.02	4.707E-03	% P	2.517E-02 7.29E-03	G
NB-94		-2.8484E-03					
			871.10	-2.848E-03	&(P	2.139E-02 6.15E-03	G K
			702.50	5.394E-03	% P	2.284E-02 6.72E-03	G K
Ag-108M		3.7538E-03					
			722.95	3.754E-03	&(	1.384E-02 4.02E-03	G K
			614.37	-1.427E-02	%	3.351E-02 1.01E-02	G
			433.93	-6.929E-03	% P	2.197E-02 6.51E-03	G
CD-109		1.5320E-02					
			88.04	1.532E-02	%(P	9.403E-01 2.81E-01	G
SN-113		-5.3092E-03					
			391.71	-5.309E-03	%(P	2.784E-02 8.14E-03	G K
			255.04	4.152E-01	%	9.829E-01 2.97E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	-2.5941E-04						
		427.95	-2.594E-04	&(P	6.066E-02	1.75E-02	G K
		600.77	-2.040E-03	% P	1.098E-01	3.13E-02	G
		636.15	-9.845E-03	% P	1.482E-01	4.19E-02	G
		463.51	1.122E-01	% P	1.932E-01	5.89E-02	G
		176.29	-4.637E-02	% P	3.600E-01	1.07E-01	G
I-131	0.0000E+00						
		364.48	0.000E+00	&(	2.650E-02	7.67E-03	G K
		636.97	-7.430E-03	%	3.234E-01	9.20E-02	G
		284.29	3.415E-02	%	4.456E-01	1.32E-01	G
CS-134	1.0618E-02						
		604.66	2.515E-04	%(P	5.220E-02	1.55E-02	G K
		795.76	2.246E-02	*(P	2.405E-02	7.73E-03	G
		569.29	2.340E-02	%	1.197E-01	3.51E-02	G
		801.84	-8.359E-03	% P	2.376E-01	6.73E-02	G
CS-137	7.0852E-03						
		661.62	7.085E-03	%(P	3.074E-02	9.04E-03	G
CE-139	-3.1916E-04						
		165.85	-3.192E-04	&(P	3.055E-02	9.09E-03	G
EU-152	-1.1065E-02						
		121.78	-1.107E-02	&(P	8.880E-02	2.66E-02	G K
		344.30	-1.760E-02	% P	7.686E-02	2.28E-02	G
		1408.08	3.230E-02	% P	1.087E-01	3.17E-02	G
		964.00	-5.096E-02	& P	2.304E-01	6.80E-02	G
		1112.07	4.249E-02	% P	1.741E-01	5.08E-02	G
		778.90	1.020E-01	% P	1.437E-01	4.50E-02	G
EU-154	2.8175E-03						
		123.10	2.817E-03	&(P	4.955E-02	1.47E-02	G K
		1274.80	-2.265E-02	% P	8.476E-02	2.49E-02	G
		723.30	-7.042E-02	& P	1.519E-01	4.59E-02	G
		1004.80	-3.353E-02	& P	1.455E-01	4.26E-02	G
EU-155	4.4364E-02						
		86.45	4.436E-02	%(	1.075E-01	3.25E-02	G K
		105.31	3.663E-04	% P	1.217E-01	3.63E-02	G
HG-203	7.6341E-03						
		279.17	7.634E-03	%(P	2.574E-02	7.71E-03	G K
		72.87	-2.231E-01	% P	7.696E-01	2.32E-01	G
		70.83	-1.835E-02	%	1.233E+00	3.68E-01	G
		82.50	-6.675E-01	%	1.643E+00	4.97E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	1.7977E-01						
		583.14	1.798E-01	*(P	3.389E-02	1.74E-02	G
		510.72	2.538E-01	+ P	1.125E-01	4.55E-02	G
PB-212	3.8546E-01						
		238.63	3.855E-01	(P	5.223E-02	2.06E-02	G K
							Energy duplication
		77.11	2.320E-01	}	1.636E-01	4.94E-02	G
		74.81	5.889E-01	+ P	3.047E-01	9.80E-02	G
PB-214	4.0399E-01						
		351.99	4.040E-01	*(P	5.517E-02	2.71E-02	G K
		295.22	3.044E-01	- P	1.099E-01	4.22E-02	G
							Energy duplication
		77.11	3.505E-01	} P	3.448E-01	9.66E-02	G
		241.92	5.138E-01	+ P	3.139E-01	1.00E-01	G
BI-212	4.7117E-01						
		727.17	4.712E-01	*(P	1.974E-01	8.65E-02	G K
		1620.56	1.551E-01	& P	6.083E-01	1.72E-01	G
		785.42	3.007E-01	% P	9.034E-01	2.66E-01	G
BI-214	3.4823E-01						
		609.32	3.482E-01	*(P	5.988E-02	3.03E-02	G K
		1764.51	4.521E-01	+ P	9.326E-02	5.93E-02	G
		1120.28	6.153E-01	+ P	2.027E-01	9.86E-02	G
RA-224	2.4688E-01						
		241.00	2.469E-01	&(P	8.974E-01	2.70E-01	G
RA-226	6.4904E-01						
		185.99	6.490E-01	*(	6.922E-01	2.14E-01	G
AC-228	6.3771E-01						
		911.07	6.454E-01	*(P	9.623E-02	5.58E-02	G K
		968.90	6.603E-01	*(P	1.568E-01	7.49E-02	G
		338.40	5.863E-01	*(P	1.949E-01	8.67E-02	G
TH-227	-7.3450E-03						
		236.00	-7.345E-03	%(P	3.126E-01	9.34E-02	G K
		256.25	1.074E-01	% P	3.075E-01	9.24E-02	G
PA-234	-4.2246E-02						
		98.44	-4.225E-02	%(	9.648E-02	2.92E-02	G K
		946.00	-6.417E-04	%	1.111E-01	3.13E-02	G
		131.28	1.134E-04	%	1.260E-01	3.75E-02	G
		94.67	-6.675E-03	%	1.852E-01	5.52E-02	G
		883.24	5.809E-02	&	1.700E-01	5.05E-02	G
		926.70	2.676E-02	&	1.806E-01	5.18E-02	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26 3.456E-02 %   1.771E-01 5.19E-02 G

TH-234       1.9596E-01
                           63.29 1.960E-01 %(P 1.298E+00 3.88E-01 G K
                           92.80 4.478E-01 % P 1.058E+00 3.19E-01 G
                           92.38-1.204E-02 % P 1.190E+00 3.54E-01 G

AM-241      -7.9927E-04
                           59.54-7.993E-04 %(P 1.713E-01 5.10E-02 G
   ( - This peak used in the nuclide activity average.

   * - Peak is too wide, but only one peak in library.
   ! - Peak is part of a multiplet and this area went
       negative during deconvolution.
   ? - Peak is too narrow.
   @ - Peak is too wide at FW25M, but ok at FWHM.
   % - Peak fails sensitivity test.
   $ - Peak identified, but first peak of this nuclide
       failed one or more qualification tests.
   + - Peak activity higher than counting uncertainty range.
   - - Peak activity lower than counting uncertainty range.
   = - Peak outside analysis energy range.
   & - Calculated peak centroid is not close enough to the
       library energy centroid for positive identification.
   P - Peakbackground subtraction
   } - Peak is too close to another for the activity
       to be found directly.

   Nuclide Codes:                      Peak Codes:
   T - Thermal Neutron Activation      G - Gamma Ray
   F - Fast Neutron Activation         X - X-Ray
   I - Fission Product                 P - Positron Decay
   N - Naturally Occurring Isotope     S - Single-Escape
   P - Photon Reaction                 D - Double-Escape
   C - Charged Particle Reaction       K - Key Line
   M - No MDA Calculation              A - Not in Average
   R - Coincidence Corrected           C - Coincidence Peak
   H - Halflife limit exceeded

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
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***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	1.9895E-02	2.0711E-02	1.6010E-01	1.6010E-01	1.760E-01
K-40	#	8.9572E+00	8.9572E+00	8.1392E-01	9.7073E-01	
MN-54	#A	4.2399E-04	4.2692E-04	2.5309E-02	2.5309E-02	2.905E-02
CO-57	#B	-3.3627E-03	-3.3895E-03	2.7408E-02	2.7408E-02	2.931E-02
CO-60	#B	-2.5263E-03	-2.5291E-03	2.7361E-01	2.7361E-01	2.229E-02

Sr-85	#A	-1.0469E-02	-1.0821E-02	2.7261E-02	2.7268E-02	2.924E-02
Kr-85	#A	-2.6755E+02	-2.6756E+02	7.3922E+02	7.3939E+02	6.787E+02
Y-88	#B	-3.6310E-03	-3.7048E-03	2.7430E-02	2.7431E-02	2.120E-02
NB-94	#B	-2.8484E-03	-2.8484E-03	1.9470E-02	1.9470E-02	2.139E-02
Ag-108M	#B	3.7537E-03	3.7538E-03	1.2054E-02	1.2056E-02	1.384E-02
CD-109	#A	1.5247E-02	1.5320E-02	8.4330E-01	8.4330E-01	9.358E-01
SN-113	#B	-5.2112E-03	-5.3092E-03	3.3886E-02	3.3888E-02	2.732E-02
SB-125	#B	-2.5886E-04	-2.5941E-04	7.3798E-02	7.3798E-02	6.053E-02
I-131	#B	0.0000E+00	0.0000E+00	2.2999E-02	2.2999E-02	2.029E-02
CS-134	#B	1.0588E-02	1.0618E-02	1.0958E-02	1.0976E-02	5.205E-02
CS-137	#A	7.0838E-03	7.0852E-03	2.7132E-02	2.7136E-02	3.074E-02
CE-139	#A	-3.1422E-04	-3.1916E-04	4.4739E-02	4.4739E-02	3.008E-02
EU-152	#B	-1.1060E-02	-1.1065E-02	8.0933E-02	8.0935E-02	8.875E-02
EU-154	#B	2.8155E-03	2.8175E-03	4.4149E-02	4.4149E-02	4.951E-02
EU-155	#B	4.4311E-02	4.4364E-02	9.7628E-02	9.7659E-02	1.074E-01
HG-203	#B	7.2905E-03	7.6341E-03	2.3119E-02	2.3123E-02	2.458E-02
TL-208	#	1.7977E-01	1.7977E-01	5.2167E-02	5.3236E-02	
PB-212		3.8546E-01	3.8546E-01	6.1669E-02	6.5736E-02	
PB-214		4.0399E-01	4.0399E-01	8.1386E-02	8.4811E-02	
BI-212	#	4.7117E-01	4.7117E-01	2.5938E-01	2.6087E-01	
BI-214		3.4823E-01	3.4823E-01	9.0820E-02	9.3120E-02	
RA-224	#A	2.4688E-01	2.4688E-01	8.1077E-01	8.1090E-01	8.974E-01
RA-226	#A	6.4904E-01	6.4904E-01	6.4250E-01	6.4364E-01	6.922E-01
AC-228	#	6.3771E-01	6.3771E-01	1.3098E-01	1.3629E-01	
TH-227	#B	-7.3450E-03	-7.3450E-03	3.2188E-01	3.2188E-01	3.126E-01
PA-234	#B	-4.2246E-02	-4.2246E-02	8.7630E-02	8.7661E-02	9.648E-02
TH-234	#B	1.9596E-01	1.9596E-01	1.1630E+00	1.1630E+00	1.298E+00
AM-241	#A	-7.9926E-04	-7.9927E-04	3.5707E+00	3.5707E+00	1.713E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (270.7 to 2000.1 keV) 1.1383497E+01 pCi/gm
Total Decayed Activity (270.7 to 2000.1 keV) 1.1383497E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JJM

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 107F_12SEPT2006_1047.An1

Sample description
FSS-OOL-05-10-014-F

Spectrum Filename: C:\GammaVision\Spectra\107F_12SEPT2006_1047.An1

Acquisition information
Start time: 12-Sep-2006 10:48:59
Live time: 2000
Real time: 2004
Dead time: 0.17 %
Detector ID: 2

Detector system
Det 107- DSPE- 634

Calibration
Filename: D7_1LSa.Clb
Detector 107 Calibration for 1 Liter Sand Marinelli

Energy Calibration
Created: 29-Oct-2004 06:48:53
Zero offset: 0.157 keV
Gain: 0.500 keV/channel
Quadratic: -1.676E-08 keV/channel^2

Efficiency Calibration
Created: 29-Oct-2004 06:51:32
Type: Polynomial
Uncertainty: 1.174 %
Coefficients: -0.279532 -4.778179 0.614896
-0.087174 0.005356 -0.000131

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.16keV)
Stop channel: 4000 (2000.15keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 2.1360E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 2.1360E+03) =
4.6816E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	09-Sep-2006 11:45:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	107_150K_28APR05.Pbc 01-May-2005 05:30:33
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 16 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.1000

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
74.73	249.	15.95	1.18	2.849E-02	74.81	9.600	5.760E-01	PB212
77.03	209.	18.79	1.18	2.957E-02	77.11	17.500	4.868E-01	PB212
					77.11	10.700	7.866E-01	PB214
77.11	179.	25.64	1.50	2.957E-02	77.11	17.500	PBC<MDA	PB212
					77.11	10.700	PBC<MDA	PB214
92.94	156.	27.06	1.59	3.441E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
186.42	179.	24.41	1.99	3.607E-02	185.99	3.280	9.553E-01	RA226
208.77	142.	27.00	1.40	3.433E-02				
239.13	1387.	4.84	2.14	3.185E-02	238.63	43.100	6.309E-01	PB212
242.08	154.	22.48	1.30	3.163E-02	241.00	3.900	PBC<MDA	RA224
					241.92	7.470	4.126E-01	PB214
295.15	251.	10.32	1.34	2.768E-02	295.22	19.200	2.938E-01	PB214
300.47	87.	23.93	1.34	2.733E-02				
338.63	221.	16.37	2.09	2.499E-02	338.40	12.010	4.584E-01	AC228
351.91	585.	7.90	1.85	2.426E-02	351.99	37.100	4.075E-01	PB214
510.89	186.	12.57	2.28	1.808E-02	510.72	22.500	2.361E-01	TL208
583.26	395.	9.03	2.29	1.629E-02	583.14	86.000	1.765E-01	TL208
609.52	445.	6.02	1.73	1.574E-02	609.32	46.090	3.840E-01	BI214
727.36	151.	15.42	1.97	1.374E-02	727.17	11.800	5.856E-01	BI212
911.40	285.	7.80	2.09	1.160E-02	911.07	29.000	5.273E-01	AC228
967.80	235.	9.13	2.55	1.110E-02	968.90	17.460	7.590E-01	AC228
1120.77	119.	18.20	1.76	9.967E-03	1120.28	15.040	4.988E-01	BI214
1461.02	1146.	3.06	2.54	8.190E-03	1460.75	10.700	8.240E+00	K40
1764.70	88.	10.66	1.48	7.083E-03	1764.51	15.920	4.887E-01	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide
417.17	208.77	514.	142.	0.071	80.99	1.404	LU-177 s
600.46	300.42	284.	78.	0.039	107.23	1.847	PB-212 sM

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.
M - Peak is close to a library peak.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-212	149.29	74.81	691.	249.	0.125	47.84	1.178D
PB-212	153.89	77.11	746.	209.	0.104	56.37	1.179A
PB-214	153.89	77.11	1217.	179.	0.090	76.93	1.500A
TH-234	185.61	92.97	1317.	159.	0.079	94.86	1.500s
TH-234	185.58	92.96	1297.	144.	0.072	95.40	1.500s
RA-226	372.49	186.42	639.	179.	0.089	73.23	1.985s
TH-227	471.10	235.73	1312.	-152.	-0.076	104.37	1.500s
PB-212	476.89	238.63	506.	823.	0.412	15.25	1.297D
PB-214	483.47	241.92	535.	154.	0.077	67.44	1.299D
PB-214	590.72	295.55	451.	377.	0.189	33.84	1.879s
AC-228	676.87	338.63	322.	218.	0.109	49.10	2.085s
PB-214	703.44	351.91	383.	580.	0.290	23.71	1.853s
TL-208	1021.38	510.89	157.	152.	0.076	37.71	2.278s
TL-208	1166.10	583.26	209.	391.	0.195	27.09	2.290s
BI-214	1218.62	609.52	105.	440.	0.220	18.05	1.734s
Ag-108M	1223.83	612.13	269.	-81.	-0.040	92.21	1.561s
BI-212	1454.29	727.36	105.	150.	0.075	46.26	1.967s
AC-228	1822.37	911.40	71.	281.	0.140	23.39	2.094s
AC-228	1935.17	967.80	65.	232.	0.116	27.40	2.551s
BI-214	2241.10	1120.77	91.	118.	0.059	54.59	1.760s
K-40	2921.64	1461.02	25.	1141.	0.571	9.18	2.542s
BI-214	3529.06	1764.70	1.	87.	0.044	31.98	1.475s

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	Peak MDA Value pCi/gm	COMMENTS
BE-7		4.5875E-02					
			477.56	4.588E-02	%(	1.893E-01 5.61E-02	G
K-40		8.2397E+00					
			1460.75	8.240E+00	(P	1.862E-01 2.53E-01	G
MN-54		5.3004E-03					
			834.81	5.300E-03	%(P	2.063E-02 6.06E-03	G
CO-57		6.8163E-03					
			122.07	6.816E-03	&(P	2.593E-02 7.79E-03	G K
			136.43	1.337E-02	% P	2.198E-01 6.56E-02	G
CO-60		-2.5411E-03					
			1332.51	-2.541E-03	%(P	2.147E-02 5.59E-03	G K
			1173.23	4.196E-03	% P	2.926E-02 8.40E-03	G K
Sr-85		-1.0196E-02					
			514.00	-1.020E-02	&(	2.796E-02 8.41E-03	G
Kr-85		-2.5245E+02					
			513.99	-2.525E+02	&(P	6.290E+02 1.88E+02	G
Y-88		-7.6917E-04					
			1836.01	-7.692E-04	%(P	2.185E-02 5.73E-03	G K
			898.02	-1.632E-03	& P	2.542E-02 7.19E-03	G
NB-94		3.4706E-03					
			871.10	3.471E-03	&(P	2.118E-02 6.14E-03	G K
			702.50	3.826E-03	% P	2.127E-02 6.22E-03	G K
Ag-108M		-1.1292E-02					
			722.95	-1.129E-02	%(	3.051E-02 9.16E-03	G K
			614.37	-3.620E-02	+	3.539E-02 1.11E-02	G
			433.93	2.088E-03	% P	1.905E-02 5.55E-03	G
CD-109		3.8351E-01					
			88.04	3.835E-01	%(P	8.717E-01 2.64E-01	G
SN-113		-2.1178E-03					
			391.71	-2.118E-03	&(P	2.920E-02 8.48E-03	G K
			255.04	1.318E-01	&	9.545E-01 2.84E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	1.0844E-02						
		427.95	1.084E-02	&(P	5.750E-02	1.69E-02	G K
		600.77	1.774E-02	& P	1.167E-01	3.41E-02	G
		636.15	7.754E-03	& P	1.666E-01	4.77E-02	G
		463.51	1.255E-01	% P	1.929E-01	5.91E-02	G
		176.29	3.486E-02	& P	3.510E-01	1.05E-01	G
I-131	3.5356E-03						
		364.48	3.536E-03	%(	2.676E-02	7.87E-03	G K
		636.97	1.738E-02	%	3.203E-01	9.18E-02	G
		284.29	5.015E-02	%	3.847E-01	1.14E-01	G
CS-134	6.9058E-04						
		604.66	6.906E-04	&(P	5.214E-02	1.55E-02	G K
		795.76	1.713E-02	% P	2.408E-02	7.51E-03	G
		569.29	-1.963E-02	%	1.164E-01	3.40E-02	G
		801.84	1.073E-02	% P	2.522E-01	7.22E-02	G
CS-137	6.5971E-04						
		661.62	6.597E-04	&(P	2.740E-02	7.86E-03	G
CE-139	-1.9709E-03						
		165.85	-1.971E-03	&(P	2.802E-02	8.35E-03	G
EU-152	3.9284E-03						
		121.78	3.928E-03	%(P	7.273E-02	2.17E-02	G K
		344.30	-1.757E-02	% P	7.486E-02	2.23E-02	G
		1408.08	5.818E-02	% P	9.130E-02	2.85E-02	G
		964.00	-1.953E-02	& P	2.267E-01	6.61E-02	G
		1112.07	8.611E-03	% P	1.838E-01	5.22E-02	G
		778.90	2.673E-02	% P	1.384E-01	4.01E-02	G
EU-154	-1.2033E-02						
		123.10	-1.203E-02	&(P	6.108E-02	1.83E-02	G K
		1274.80	3.044E-04	& P	5.638E-02	1.55E-02	G
		723.30	-5.613E-02	% P	1.403E-01	4.22E-02	G
		1004.80	1.036E-03	& P	1.191E-01	3.34E-02	G
EU-155	4.2230E-02						
		86.45	4.223E-02	%(	1.057E-01	3.20E-02	G K
		105.31	5.324E-02	% P	1.153E-01	3.49E-02	G
HG-203	1.1599E-02						
		279.17	1.160E-02	&(P	2.279E-02	6.92E-03	G K
		72.87	-2.093E-01	% P	7.054E-01	2.13E-01	G
		70.83	-8.118E-01	%	1.337E+00	4.07E-01	G
		82.50	-4.781E-01	%	1.326E+00	4.00E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	1.7651E-01						
		583.14	1.765E-01	*(P	3.166E-02	1.61E-02	G
		510.72	2.361E-01	+ P	9.506E-02	3.63E-02	G
PB-212	3.7896E-01						
		238.63	3.790E-01	(P	4.947E-02	1.96E-02	G K
							Energy duplication
		77.11	2.551E-01	}	1.589E-01	4.79E-02	G
		74.81	5.760E-01	+ P	2.896E-01	9.33E-02	G
PB-214	4.2064E-01						
		351.99	4.075E-01	*(P	6.604E-02	3.25E-02	G K
		295.22	4.492E-01	@(P	1.210E-01	5.13E-02	G
							Energy duplication
		77.11	3.580E-01	} P	3.304E-01	9.18E-02	G
		241.92	4.126E-01	(P	2.958E-01	9.36E-02	G
BI-212	5.8564E-01						
		727.17	5.856E-01	(P	1.968E-01	9.11E-02	G K
		1620.56	3.109E-01	% P	6.332E-01	1.92E-01	G
		785.42	-3.355E-01	& P	1.168E+00	3.43E-01	G
BI-214	3.8399E-01						
		609.32	3.840E-01	*(P	4.393E-02	2.33E-02	G K
		1764.51	4.887E-01	+ P	4.135E-02	5.26E-02	G
		1120.28	4.988E-01	+ P	1.988E-01	9.14E-02	G
RA-224	-1.3663E-03						
		241.00	-1.366E-03	&(P	8.324E-01	2.48E-01	G
RA-226	9.5529E-01						
		185.99	9.553E-01	*(	6.439E-01	2.33E-01	G
AC-228	5.0712E-01						
		911.07	5.273E-01	*(P	7.911E-02	4.17E-02	G K
		968.90	7.590E-01	+ P	1.312E-01	7.00E-02	G
		338.40	4.584E-01	*(P	1.820E-01	7.62E-02	G
TH-227	-2.6691E-01						
		236.00	-2.669E-01	&(P	3.018E-01	9.27E-02	G K
		256.25	-7.893E-02	& P	2.961E-01	8.84E-02	G
PA-234	3.0857E-02						
		98.44	3.086E-02	%(	1.050E-01	3.16E-02	G K
		946.00	-3.191E-03	%	1.074E-01	3.04E-02	G
		131.28	-8.764E-03	&	1.216E-01	3.63E-02	G
		94.67	-1.035E-01	%	2.025E-01	6.15E-02	G
		883.24	3.776E-02	%	1.603E-01	4.68E-02	G
		926.70	7.498E-03	&	2.165E-01	6.19E-02	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26-3.020E-02 %   1.723E-01 5.04E-02 G

TH-234       7.0732E-01
                           63.29 2.855E-01 %(P 1.214E+00 3.64E-01 G K
                           92.80 8.845E-01  (P 1.046E+00 3.20E-01 G
                           92.38 1.141E+00  (P 1.233E+00 3.79E-01 G

AM-241       2.8102E-03
                           59.54 2.810E-03 %(P 1.704E-01 5.08E-02 G
   ( - This peak used in the nuclide activity average.

   * - Peak is too wide, but only one peak in library.
   ! - Peak is part of a multiplet and this area went
       negative during deconvolution.
   ? - Peak is too narrow.
   @ - Peak is too wide at FW25M, but ok at FWHM.
   % - Peak fails sensitivity test.
   $ - Peak identified, but first peak of this nuclide
       failed one or more qualification tests.
   + - Peak activity higher than counting uncertainty range.
   - - Peak activity lower than counting uncertainty range.
   = - Peak outside analysis energy range.
   & - Calculated peak centroid is not close enough to the
       library energy centroid for positive identification.
   P - Peakbackground subtraction
   } - Peak is too close to another for the activity
       to be found directly.

   Nuclide Codes:                      Peak Codes:
   T - Thermal Neutron Activation      G - Gamma Ray
   F - Fast Neutron Activation         X - X-Ray
   I - Fission Product                 P - Positron Decay
   N - Naturally Occurring Isotope     S - Single-Escape
   P - Photon Reaction                 D - Double-Escape
   C - Charged Particle Reaction       K - Key Line
   M - No MDA Calculation              A - Not in Average
   R - Coincidence Corrected           C - Coincidence Peak
   H - Halflife limit exceeded

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
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***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	4.4145E-02	4.5875E-02	1.6822E-01	1.6824E-01	1.821E-01
K-40	#	8.2397E+00	8.2397E+00	7.5990E-01	9.0237E-01	
MN-54	#A	5.2657E-03	5.3004E-03	1.8172E-02	1.8174E-02	2.049E-02
CO-57	#B	6.7647E-03	6.8163E-03	2.3377E-02	2.3380E-02	2.573E-02
CO-60	#B	-2.5384E-03	-2.5411E-03	5.0291E-01	5.0291E-01	2.144E-02

Sr-85	#A	-9.8785E-03	-1.0196E-02	2.5232E-02	2.5239E-02	2.709E-02
Kr-85	#A	-2.5245E+02	-2.5245E+02	6.8546E+02	6.8562E+02	6.290E+02
Y-88	#B	-7.5450E-04	-7.6917E-04	2.7947E-02	2.7947E-02	2.143E-02
NB-94	#B	3.4706E-03	3.4706E-03	1.8422E-02	1.8424E-02	2.118E-02
Ag-108M	#B	-1.1291E-02	-1.1292E-02	2.7484E-02	2.7492E-02	3.051E-02
CD-109	#A	3.8177E-01	3.8351E-01	7.9224E-01	7.9252E-01	8.678E-01
SN-113	#B	-2.0803E-03	-2.1178E-03	5.7332E-02	5.7332E-02	2.869E-02
SB-125	#B	1.0822E-02	1.0844E-02	5.0679E-02	5.0683E-02	5.739E-02
I-131	#B	2.7390E-03	3.5356E-03	2.3605E-02	2.3606E-02	2.073E-02
CS-134	#B	6.8870E-04	6.9058E-04	4.6480E-02	4.6480E-02	5.200E-02
CS-137	#A	6.5959E-04	6.5971E-04	2.3587E-02	2.3587E-02	2.739E-02
CE-139	#A	-1.9417E-03	-1.9709E-03	2.6981E-02	2.6982E-02	2.760E-02
EU-152	#B	3.9266E-03	3.9284E-03	6.4957E-02	6.4958E-02	7.270E-02
EU-154	#B	-1.2025E-02	-1.2033E-02	5.7049E-02	5.7052E-02	6.104E-02
EU-155	#B	4.2182E-02	4.2230E-02	9.5965E-02	9.5993E-02	1.056E-01
HG-203	#B	1.1099E-02	1.1599E-02	2.0750E-02	2.0761E-02	2.181E-02
TL-208	#	1.7651E-01	1.7651E-01	4.8379E-02	4.9489E-02	
PB-212		3.7896E-01	3.7896E-01	5.8883E-02	6.2993E-02	
PB-214		4.2064E-01	4.2064E-01	1.0060E-01	1.0362E-01	
BI-212		5.8564E-01	5.8564E-01	2.7325E-01	2.7543E-01	
BI-214		3.8399E-01	3.8399E-01	6.9973E-02	7.3556E-02	
RA-224	#A	-1.3663E-03	-1.3663E-03	9.4719E-01	9.4719E-01	8.324E-01
RA-226	#	9.5529E-01	9.5529E-01	6.9951E-01	7.0178E-01	
AC-228	#	5.0712E-01	5.0712E-01	1.2041E-01	1.2408E-01	
TH-227	#A	-2.6691E-01	-2.6691E-01	2.7906E-01	2.7951E-01	3.018E-01
PA-234	#B	3.0857E-02	3.0857E-02	9.4921E-02	9.4937E-02	1.050E-01
TH-234	#B	7.0732E-01	7.0732E-01	7.0464E-01	7.0573E-01	1.214E+00
AM-241	#A	2.8102E-03	2.8102E-03	1.5248E-01	1.5248E-01	1.704E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (295.2 to 2000.1 keV) 1.1647876E+01 pCi/gm
Total Decayed Activity (295.2 to 2000.1 keV) 1.1647879E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JPK

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

YAEC Chemistry Lab Spectrum name: 107F_13SEPT2006_0853.An1

Sample description
FSS-OOL-05-10-013-F

Spectrum Filename: C:\GammaVision\Spectra\107F_13SEPT2006_0853.An1

Acquisition information
Start time: 13-Sep-2006 08:53:33
Live time: 2000
Real time: 2003
Dead time: 0.14 %
Detector ID: 2

Detector system
Det 107- DSPE- 634

Calibration
Filename: D7_1LSa.Clb
Detector 107 Calibration for 1 Liter Sand Marinelli

Energy Calibration
Created: 29-Oct-2004 06:48:53
Zero offset: 0.157 keV
Gain: 0.500 keV/channel
Quadratic: -1.676E-08 keV/channel^2

Efficiency Calibration
Created: 29-Oct-2004 06:51:32
Type: Polynomial
Uncertainty: 1.174 %
Coefficients: -0.279532 -4.778179 0.614896
-0.087174 0.005356 -0.000131

Library Files
Main analysis library: FSS_Rev_1.Lib
Library Match Width: 1.000
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G53W4.20
Start channel: 100 (50.16keV)
Stop channel: 4000 (2000.15keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 1.9260E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.9260E+03) =
5.1921E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	09-Sep-2006 11:35:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	107_150K_28APR05.Pbc 01-May-2005 05:30:33
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 16 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.3509

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
74.94	207.	27.90	1.50	2.849E-02				
74.94	207.	27.90	1.50	2.849E-02	74.81	9.600	5.308E-01	PB212
77.06	389.	14.09	1.50	2.957E-02	77.11	10.700	8.636E-01	PB214
					77.11	17.500	5.280E-01	PB212
77.06	394.	14.09	1.50	2.957E-02	77.11	10.700	8.636E-01	PB214
					77.11	17.500	5.345E-01	PB212
92.68	102.	40.93	1.50	3.438E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
92.68	119.	39.61	1.50	3.429E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
185.62	165.	29.12	2.16	3.610E-02	185.99	3.280	9.765E-01	RA226
238.76	765.	5.37	1.30	3.188E-02	238.63	43.100	3.825E-01	PB212
					241.00	3.900	4.330E+00	RA224
242.12	173.	16.31	1.30	3.161E-02	241.92	7.470	5.108E-01	PB214
295.32	254.	10.17	1.34	2.768E-02				
295.32	254.	10.17	1.34	2.768E-02	295.22	19.200	3.298E-01	PB214
300.25	53.	35.34	1.34	2.735E-02				
338.48	247.	16.39	2.33	2.500E-02	338.40	12.010	5.701E-01	AC228
351.87	597.	6.20	2.39	2.426E-02				
351.87	597.	6.20	2.39	2.426E-02	351.99	37.100	4.614E-01	PB214
463.30	44.	35.35	1.50	1.953E-02	463.51	10.000	PBC<MDA	SB125
510.28	139.	15.66	1.44	1.808E-02	510.72	22.500	2.400E-01	TL208
583.32	368.	8.04	2.22	1.629E-02	583.14	86.000	1.818E-01	TL208
609.29	421.	7.03	2.10	1.574E-02	609.32	46.090	4.029E-01	BI214
661.55	104.	23.57	2.98	1.477E-02	661.62	84.620	5.866E-02	CS137
727.65	95.	19.78	1.71	1.374E-02	727.17	11.800	4.055E-01	BI212
794.63	29.	38.78	1.68	1.284E-02	795.76	85.400	PBC<MDA	CS134

911.29	275.	9.33	1.94	1.161E-02	911.07	29.000	5.641E-01	AC228
967.91	208.	9.30	2.49	1.110E-02	968.90	17.460	7.469E-01	AC228
1119.78	127.	20.15	2.18	9.970E-03	1120.28	15.040	5.939E-01	BI214

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
1460.96	1060.	3.15	2.40	8.190E-03	1460.75	10.700	8.448E+00	K40
1621.47	25.	26.17	0.56	7.569E-03	1620.56	2.750	8.494E-01	BI212
1764.58	103.	9.85	2.07	7.083E-03	1764.51	15.920	6.353E-01	BI214

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
477.15	238.83	462.	765.	0.383	16.11	1.297	PB-212	D
483.88	242.19	314.	173.	0.087	48.94	1.299	PB-214	D
600.13	300.08	149.	53.	0.027	106.03	1.341	PB-212	lD
703.35	351.87	695.	144.	0.072	81.44	2.391	PB-214	s

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: FSS_Rev_1.Lib

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

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV
PB-212	149.29	74.81	1628.	207.	0.103	83.71	1.500D
PB-214	153.89	77.11	1350.	389.	0.195	42.26	1.500D
PB-212	153.89	77.11	1345.	394.	0.197	42.26	1.500D
RA-226	370.89	185.62	737.	165.	0.082	87.35	2.158s
PB-212	477.13	238.75	901.	740.	0.370	19.94	1.500s
RA-224	477.29	238.83	673.	696.	0.348	19.41	1.500s
PB-214	590.20	295.29	358.	262.	0.131	35.06	1.500s
AC-228	676.58	338.48	370.	244.	0.122	49.16	2.325s
PB-214	703.74	352.06	254.	449.	0.224	20.39	1.500s
SB-125	926.21	463.30	116.	44.	0.022	106.04	1.500s
TL-208	1020.16	510.28	185.	139.	0.070	46.98	1.442s
TL-208	1166.23	583.32	145.	363.	0.182	24.11	2.220s
BI-214	1218.15	609.29	142.	417.	0.208	21.10	2.096s
CS-137	1322.67	661.55	139.	104.	0.052	70.71	2.978s
BI-212	1454.86	727.65	87.	94.	0.047	59.33	1.713
CS-134	1588.83	794.63	52.	29.	0.015	116.34	1.684s
AC-228	1822.15	911.29	93.	271.	0.135	27.99	1.937s
AC-228	1935.38	967.91	53.	206.	0.103	27.89	2.492s
BI-214	2239.13	1119.78	110.	127.	0.063	60.44	2.184s
K-40	2921.51	1460.96	20.	1055.	0.528	9.44	2.398s
BI-212	3242.56	1621.47	7.	25.	0.013	78.51	0.559s
BI-214	3528.81	1764.58	1.	102.	0.051	29.56	2.071s

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity pCi/gm	Peak Energy keV	Peak Activity pCi/gm	Peak Code	Peak MDA Value pCi/gm	COMMENTS
BE-7		2.0359E-02					
			477.56	2.036E-02	&(	1.984E-01 5.78E-02 G	
K-40		8.4481E+00					
			1460.75	8.448E+00	*(P	1.874E-01 2.67E-01 G	
MN-54		-2.4510E-04					
			834.81	-2.451E-04	&(P	3.372E-02 9.75E-03 G	
CO-57		-1.0653E-02					
			122.07	-1.065E-02	%(P	3.239E-02 9.77E-03 G K	
			136.43	6.149E-04	% P	2.244E-01 6.67E-02 G	
CO-60		-3.0137E-03					
			1332.51	-3.014E-03	&(P	3.209E-02 8.81E-03 G K	
			1173.23	4.415E-03	& P	3.076E-02 8.79E-03 G K	
Sr-85		-5.8738E-03					
			514.00	-5.874E-03	%(	2.782E-02 8.25E-03 G	
Kr-85		-1.5764E+02					
			513.99	-1.576E+02	%(P	6.207E+02 1.83E+02 G	
Y-88		-9.6133E-04					
			1836.01	-9.613E-04	&(P	2.171E-02 5.57E-03 G K	
			898.02	-4.727E-03	% P	2.405E-02 6.84E-03 G	
NB-94		-3.2305E-03					
			871.10	-3.230E-03	%(P	2.317E-02 6.68E-03 G K	
			702.50	3.070E-04	% P	2.752E-02 7.94E-03 G K	
Ag-108M		1.7928E-04					
			722.95	1.793E-04	%(	2.818E-02 8.10E-03 G K	
			614.37	-2.804E-02	&	3.849E-02 1.19E-02 G	
			433.93	3.281E-03	& P	2.176E-02 6.37E-03 G	
CD-109		5.4318E-01					
			88.04	5.432E-01	%(P	8.844E-01 2.69E-01 G	

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SN-113	9.2993E-03						
		391.71	9.299E-03	%(P	3.150E-02	9.37E-03	G K
		255.04	-1.283E-01	&	1.103E+00	3.28E-01	G
SB-125	5.1286E-02						
		427.95	1.512E-02	%(P	5.843E-02	1.72E-02	G K
		600.77	-3.875E-02	% P	1.283E-01	3.79E-02	G
		636.15	3.759E-04	& P	1.479E-01	4.14E-02	G
		463.51	1.583E-01	*(P	1.906E-01	5.95E-02	G
		176.29	7.192E-02	% P	3.744E-01	1.12E-01	G
I-131	-8.9357E-03						
		364.48	-8.936E-03	%(	3.449E-02	1.03E-02	G K
		636.97	1.986E-02	&	4.665E-01	1.35E-01	G
		284.29	1.155E-01	%	4.632E-01	1.38E-01	G
CS-134	-2.1032E-02						
		604.66	-2.103E-02	%(P	3.800E-02	1.16E-02	G K
		795.76	1.876E-02	+ P	2.335E-02	7.41E-03	G
		569.29	-5.873E-03	%	1.294E-01	3.72E-02	G
		801.84	-5.064E-02	% P	2.575E-01	7.49E-02	G
CS-137	5.8656E-02						
		661.62	5.866E-02	*(P	3.232E-02	1.43E-02	G
CE-139	4.8945E-03						
		165.85	4.895E-03	%(P	2.807E-02	8.39E-03	G
EU-152	-3.1580E-02						
		121.78	-3.158E-02	%(P	9.401E-02	2.84E-02	G K
		344.30	-6.149E-03	& P	8.083E-02	2.37E-02	G
		1408.08	3.125E-02	% P	1.001E-01	2.91E-02	G
		964.00	1.512E-02	& P	2.423E-01	7.04E-02	G
		1112.07	4.330E-02	% P	1.740E-01	5.07E-02	G
		778.90	-2.834E-02	% P	1.703E-01	4.92E-02	G
EU-154	-2.4445E-02						
		123.10	-2.445E-02	%(P	6.245E-02	1.89E-02	G K
		1274.80	-8.976E-03	% P	8.449E-02	2.42E-02	G
		723.30	-5.887E-02	% P	1.522E-01	4.56E-02	G
		1004.80	2.835E-02	% P	8.579E-02	2.51E-02	G
EU-155	7.4076E-02						
		86.45	7.408E-02	&(	1.106E-01	3.38E-02	G K
		105.31	3.858E-02	% P	1.237E-01	3.73E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
HG-203	1.1457E-02						
		279.17	1.146E-02	&(P	2.604E-02	7.87E-03	G K
		72.87	1.208E-01	% P	5.786E-01	1.74E-01	G
		70.83	4.311E-01	%	1.342E+00	4.05E-01	G
		82.50	-6.341E-01	&	1.423E+00	4.31E-01	G
TL-208	1.8183E-01						
		583.14	1.818E-01	*(P	2.946E-02	1.48E-02	G
		510.72	2.400E-01	+ P	1.139E-01	4.67E-02	G
PB-212	3.7789E-01						
		238.63	3.779E-01	*(P	7.277E-02	2.57E-02	G K
							Energy duplication
		77.11	5.345E-01	+	2.353E-01	7.53E-02	G
							Energy duplication
		74.81	5.308E-01	& P	4.892E-01	1.51E-01	G
PB-214	3.4869E-01						
		351.99	3.498E-01	*(P	5.998E-02	2.40E-02	G K
		295.22	3.465E-01	*(P	1.199E-01	4.12E-02	G
							Energy duplication
		77.11	8.636E-01	+ P	3.856E-01	1.23E-01	G
		241.92	-1.095E-02	& P	4.882E-01	1.46E-01	G
BI-212	4.0547E-01						
		727.17	4.055E-01	(P	2.001E-01	8.13E-02	G K
		1620.56	8.494E-01	+ P	5.010E-01	2.27E-01	G
		785.42	6.222E-01	% P	1.173E+00	3.57E-01	G
BI-214	4.0294E-01						
		609.32	4.029E-01	*(P	5.638E-02	2.86E-02	G K
		1764.51	6.353E-01	+ P	4.585E-02	6.31E-02	G
		1120.28	5.939E-01	+ P	2.415E-01	1.20E-01	G
RA-224	3.9487E+00						
		241.00	3.949E+00	&(P	7.014E-01	2.56E-01	G
RA-226	9.7650E-01						
		185.99	9.765E-01	*(	7.658E-01	2.84E-01	G
AC-228	5.6588E-01						
		911.07	5.641E-01	*(P	9.948E-02	5.35E-02	G K
		968.90	7.469E-01	+ P	1.325E-01	7.01E-02	G
		338.40	5.701E-01	*(P	2.158E-01	9.46E-02	G
TH-227	-2.2518E-01						
		236.00	-2.252E-01	%(P	3.131E-01	9.57E-02	G K
		256.25	-4.328E-02	& P	3.095E-01	9.15E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
PA-234	4.3160E-02						
		98.44	4.316E-02	%(	1.126E-01	3.40E-02	G K
		946.00	1.249E-02	&	1.177E-01	3.37E-02	G
		131.28	-7.900E-03	%	1.264E-01	3.77E-02	G
		94.67	-1.240E-01	%	2.207E-01	6.71E-02	G
		883.24	5.490E-02	%	1.642E-01	4.86E-02	G
		926.70	6.072E-03	%	2.192E-01	6.22E-02	G
		569.26	-1.033E-02	%	1.983E-01	5.72E-02	G
TH-234	3.0297E-01						
		63.29	3.030E-01	%(P	1.390E+00	4.16E-01	G K
		92.80	6.910E-01	% P	1.113E+00	3.38E-01	G
		92.38	9.440E-01	% P	1.307E+00	3.99E-01	G
AM-241	2.5538E-03						
		59.54	2.554E-03	&(P	1.780E-01	5.30E-02	G

(- This peak used in the nuclide activity average.

* - Peak is too wide, but only one peak in library.
! - Peak is part of a multiplet and this area went negative during deconvolution.
? - Peak is too narrow.
@ - Peak is too wide at FW25M, but ok at FWHM.
% - Peak fails sensitivity test.
$ - Peak identified, but first peak of this nuclide failed one or more qualification tests.
\+ - Peak activity higher than counting uncertainty range.
\- - Peak activity lower than counting uncertainty range.
= - Peak outside analysis energy range.
& - Calculated peak centroid is not close enough to the library energy centroid for positive identification.
P - Peakbackground subtraction
} - Peak is too close to another for the activity to be found directly.

Nuclide Codes:	Peak Codes:
T - Thermal Neutron Activation	G - Gamma Ray
F - Fast Neutron Activation	X - X-Ray
I - Fission Product	P - Positron Decay
N - Naturally Occurring Isotope	S - Single-Escape
P - Photon Reaction	D - Double-Escape
C - Charged Particle Reaction	K - Key Line
M - No MDA Calculation	A - Not in Average
R - Coincidence Corrected	C - Coincidence Peak
H - Halflife limit exceeded	

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***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity pCi/gm	Time Corrected Activity pCi/gm	Uncertainty Counting pCi/gm	3 Sigma Total pCi/gm	MDA pCi/gm
BE-7	#A	1.9357E-02	2.0359E-02	1.7332E-01	1.7333E-01	1.886E-01
K-40	#	8.4481E+00	8.4481E+00	8.0106E-01	9.4374E-01	
MN-54	#A	-2.4299E-04	-2.4510E-04	2.5087E-02	2.5087E-02	3.343E-02
CO-57	#B	-1.0547E-02	-1.0653E-02	2.9638E-02	2.9644E-02	3.207E-02
CO-60	#B	-3.0095E-03	-3.0137E-03	1.9884E-01	1.9884E-01	3.204E-02
Sr-85	#A	-5.6347E-03	-5.8738E-03	2.4760E-02	2.4762E-02	2.669E-02
Kr-85	#A	-1.5763E+02	-1.5764E+02	7.7653E+02	7.7659E+02	6.207E+02
Y-88	#B	-9.3733E-04	-9.6133E-04	2.9476E-01	2.9476E-01	2.117E-02
NB-94	#B	-3.2305E-03	-3.2305E-03	2.1059E-02	2.1060E-02	2.317E-02
Ag-108M	#B	1.7927E-04	1.7928E-04	2.4286E-02	2.4286E-02	2.817E-02
CD-109	#A	5.3996E-01	5.4318E-01	8.0840E-01	8.0896E-01	8.791E-01
SN-113	#B	9.0841E-03	9.2993E-03	2.8125E-02	2.8130E-02	3.077E-02
SB-125	#B	5.1149E-02	5.1286E-02	5.7863E-02	5.7942E-02	5.827E-02
I-131	#B	-6.3908E-03	-8.9357E-03	3.0814E-02	3.0819E-02	2.467E-02
CS-134	#B	-2.0957E-02	-2.1032E-02	3.5490E-02	3.5512E-02	3.786E-02
CS-137	#	5.8642E-02	5.8656E-02	4.2879E-02	4.3018E-02	
CE-139	#A	4.7995E-03	4.8945E-03	2.5170E-02	2.5172E-02	2.752E-02
EU-152	#B	-3.1561E-02	-3.1580E-02	8.5560E-02	8.5578E-02	9.396E-02
EU-154	#B	-2.4424E-02	-2.4445E-02	5.7757E-02	5.7773E-02	6.240E-02
EU-155	#B	7.3966E-02	7.4076E-02	1.0130E-01	1.0138E-01	1.105E-01
HG-203	#B	1.0813E-02	1.1457E-02	2.3606E-02	2.3615E-02	2.458E-02
TL-208	#	1.8183E-01	1.8183E-01	4.4395E-02	4.5675E-02	
PB-212	#	3.7789E-01	3.7789E-01	7.6959E-02	8.0129E-02	7.277E-02
PB-214	#	3.4869E-01	3.4869E-01	7.1821E-02	7.4715E-02	5.998E-02
BI-212		4.0547E-01	4.0547E-01	2.4387E-01	2.4505E-01	
BI-214	#	4.0294E-01	4.0294E-01	8.5885E-02	8.9121E-02	
RA-224	#	3.9487E+00	3.9487E+00	7.6885E-01	8.0345E-01	7.014E-01
RA-226	#	9.7649E-01	9.7650E-01	8.5300E-01	8.5495E-01	
AC-228	#	5.6588E-01	5.6588E-01	1.6089E-01	1.6433E-01	
TH-227	#B	-2.2518E-01	-2.2518E-01	2.8852E-01	2.8882E-01	3.131E-01
PA-234	#B	4.3160E-02	4.3160E-02	1.0210E-01	1.0213E-01	1.126E-01
TH-234	#B	3.0297E-01	3.0297E-01	1.2489E+00	1.2490E+00	1.390E+00
AM-241	#A	2.5537E-03	2.5538E-03	1.5914E-01	1.5914E-01	1.780E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (294.7 to 2000.1 keV) 1.1039319E+01 pCi/gm
Total Decayed Activity (294.7 to 2000.1 keV) 1.1039337E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JPK

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab