YAEC Chemistry Lab Spectrum name: 101F_1AUG2006_1525.An1

Sample description
FSS-OOL-10-01-006-F

Spectrum Filename: C:\GammaVision\Spectra\101F_1AUG2006_1525.An1

Acquisition information

Start time:	01-Aug-2006 15:25:12
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:	1.9810E+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	28-Jul-2006 08:14:00
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. 16 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.4934

***** 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	177.	18.39	1.00	1.651E-02				
74.41	177.	18.39	1.00	1.651E-02	74.81	9.600	7.383E-01	PB212
77.65	242.	13.76	1.01	1.743E-02	77.11	17.500	5.484E-01	PB212
					77.11	10.700	8.832E-01	PB214
93.16	108.	38.11	1.50	1.989E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
93.17	96.	41.44	1.50	1.985E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
186.54	121.	22.97	1.72	1.855E-02	185.99	3.280	1.352E+00	RA226
238.97	737.	4.22	1.12	1.556E-02	238.63	43.100	7.423E-01	PB212
241.95	111.	17.92	1.12	1.540E-02	241.00	3.900	1.250E+00	RA224
270.49	69.	34.42	1.61	1.399E-02				
277.18	60.	37.91	0.88	1.369E-02				
295.50	171.	15.75	1.03	1.291E-02	295.22	19.200	4.653E-01	PB214
300.95	49.	37.60	1.28	1.269E-02				
328.17	41.	34.27	0.87	1.169E-02				
339.01	134.	17.26	1.08	1.133E-02	338.40	12.010	6.617E-01	AC228
352.50	253.	9.37	1.18	1.091E-02	351.99	37.100	4.218E-01	PB214
463.63	56.	27.68	1.22	8.340E-03	463.51	10.000	4.507E-01	SB125
511.08	98.	17.22	1.26	7.585E-03	510.72	22.500	3.286E-01	TL208
583.64	217.	10.43	1.44	6.679E-03	583.14	86.000	2.542E-01	TL208
609.71	216.	9.96	1.50	6.409E-03	609.32	46.090	4.960E-01	BI214
719.75	17.	41.20	1.50	5.472E-03	722.95	90.499	PBC<MDA	Ag108M
728.14	46.	21.75	0.96	5.436E-03	727.17	11.800	4.782E-01	BI212
911.79	152.	10.10	1.42	4.443E-03	911.07	29.000	7.916E-01	AC228
969.49	105.	17.61	1.49	4.210E-03	968.90	17.460	9.682E-01	AC228
1121.10	50.	21.21	1.45	3.708E-03	1120.28	15.040	6.113E-01	BI214

1461.93	552.	4.43	1.83	2.940E-03	1460.75	10.700	1.192E+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	
477.64	238.91	116.	737.	0.368	12.67	1.122	PB-212	D
483.60	241.89	143.	111.	0.056	53.77	1.124	PB-214	D
540.70	270.49	198.	69.	0.034	103.26	1.607	AC-228	s
554.09	277.18	168.	75.	0.037	81.31	0.883	TL-208	
601.65	300.95	132.	49.	0.024	112.79	1.275	PB-212	s
656.12	328.17	84.	41.	0.021	102.81	0.874	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	149.12	74.78	1031.	172.	0.086	79.90	1.499s
PB-212	153.79	77.11	913.	289.	0.145	47.67	1.499D
PB-214	153.79	77.11	916.	286.	0.143	47.67	1.499D
TH-234	185.90	93.16	888.	108.	0.054	114.34	1.499s
RA-226	372.73	186.54	295.	121.	0.060	68.92	1.718s
PB-212	477.57	238.94	412.	587.	0.293	18.96	1.499
RA-224	483.65	241.97	437.	85.	0.042	108.55	1.499
PB-214	591.05	295.65	204.	147.	0.074	47.34	1.499
AC-228	677.80	339.01	152.	132.	0.066	51.79	1.081
PB-214	704.73	352.47	137.	221.	0.110	29.88	1.499s
SB-125	927.19	463.65	55.	46.	0.023	78.09	1.499s
TL-208	1022.10	511.08	86.	82.	0.041	51.66	1.256s
TL-208	1167.29	583.64	89.	214.	0.107	31.29	1.443
BI-214	1219.46	609.71	78.	215.	0.107	29.87	1.503s
Ag-108M	1439.66	719.75	16.	17.	0.008	123.60	1.499s
BI-212	1456.43	728.14	26.	45.	0.023	65.26	0.962s
AC-228	1823.92	911.79	30.	150.	0.075	30.30	1.425
AC-228	1939.40	969.49	62.	104.	0.052	52.83	1.493
BI-214	2242.78	1121.10	27.	50.	0.025	63.62	1.450
K-40	2924.87	1461.93	14.	550.	0.275	13.28	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		-2.8422E-02					
			477.56	-2.842E-02	%(	3.129E-01 8.92E-02	G
K-40		1.1919E+01					
			1460.75	1.192E+01	(P	4.349E-01 5.30E-01	G
MN-54		-8.8746E-03					
			834.81	-8.875E-03	&(P	4.816E-02 1.38E-02	G
CO-57		-4.0553E-04					
			122.07	-4.055E-04	%(	4.713E-02 1.40E-02	G K
			136.43	-2.491E-02	&	3.870E-01 1.15E-01	G
CO-60		1.5911E-02					
			1332.51	1.591E-02	%(P	5.248E-02 1.53E-02	G K
			1173.23	-2.879E-04	% P	7.457E-02 2.10E-02	G K
Sr-85		-1.9048E-02					
			514.00	-1.905E-02	%(	5.739E-02 1.72E-02	G
Kr-85		-4.4475E+02					
			513.99	-4.447E+02	%(P	1.270E+03 3.79E+02	G
Y-88		4.6998E-03					
			1836.01	4.700E-03	%(	4.288E-02 1.12E-02	G K
			898.02	1.591E-02	% P	4.482E-02 1.33E-02	G
NB-94		3.4827E-03					
			871.10	3.483E-03	%(P	3.537E-02 9.77E-03	G K
			702.50	1.542E-04	% P	4.529E-02 1.27E-02	G K
Ag-108M		2.3112E-02					
			722.95	2.311E-02	&(	2.901E-02 9.52E-03	G K
			614.37	-3.007E-02	% P	6.477E-02 1.96E-02	G
			433.93	1.855E-03	%	3.755E-02 1.08E-02	G
CD-109		1.2349E-01					
			88.04	1.235E-01	%(P	1.433E+00 4.28E-01	G
SN-113		-2.5099E-03					
			391.71	-2.510E-03	%(	6.279E-02 1.82E-02	G K
			255.04	3.300E-01	% P	1.603E+00 4.75E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	1.2590E-01						
		427.95	4.029E-02	%(P	1.052E-01	3.15E-02	G K
		600.77	-2.653E-03	% P	2.100E-01	5.90E-02	G
		636.15	-2.819E-03	% P	3.987E-01	1.13E-01	G
		463.51	3.793E-01	(P	3.048E-01	1.02E-01	G
		176.29	-1.295E-01	% P	6.146E-01	1.83E-01	G
I-131	-2.0972E-03						
		364.48	-2.097E-03	%(	6.315E-02	1.83E-02	G K
		636.97	3.438E-01	%	7.866E-01	2.37E-01	G
		284.29	1.775E-01	%	8.038E-01	2.38E-01	G
CS-134	-6.7171E-04						
		604.66	-6.717E-04	&(P	6.976E-02	2.02E-02	G K
		795.76	3.404E-02	% P	4.839E-02	1.52E-02	G
		569.29	3.371E-02	& P	2.720E-01	7.85E-02	G
		801.84	-6.958E-02	%	5.011E-01	1.43E-01	G
CS-137	2.3919E-02						
		661.62	2.392E-02	&(P	5.589E-02	1.68E-02	G
CE-139	9.7631E-03						
		165.85	9.763E-03	&(P	5.049E-02	1.51E-02	G
EU-152	3.0835E-02						
		121.78	3.083E-02	%(P	1.154E-01	3.46E-02	G K
		344.30	-3.260E-03	% P	1.090E-01	3.12E-02	G
		1408.08	2.572E-02	% P	2.099E-01	5.72E-02	G
		964.00	-8.398E-02	& P	4.186E-01	1.21E-01	G
		1112.07	2.296E-02	% P	3.941E-01	1.10E-01	G
		778.90	-7.536E-02	& P	3.552E-01	1.03E-01	G
EU-154	-2.3935E-02						
		123.10	-2.393E-02	%(P	1.048E-01	3.14E-02	G K
		1274.80	4.041E-02	% P	1.642E-01	4.76E-02	G
		723.30	6.061E-03	& P	2.471E-01	6.99E-02	G
		1004.80	1.047E-02	% P	3.340E-01	9.40E-02	G
EU-155	1.1634E-02						
		86.45	1.163E-02	%(	1.681E-01	5.03E-02	G K
		105.31	1.578E-02	%	1.939E-01	5.78E-02	G
HG-203	-1.0669E-02						
		279.17	-1.067E-02	&(	5.239E-02	1.56E-02	G K
		72.87	-5.416E-01	& P	1.159E+00	3.51E-01	G
		70.83	4.163E-01	%	1.295E+00	3.89E-01	G
		82.50	-5.399E-01	%	2.657E+00	7.98E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	2.6964E-01						
		583.14	2.542E-01	(P	5.532E-02	2.68E-02	G
		510.72	3.286E-01	*(P	1.832E-01	6.77E-02	G
PB-212	6.1352E-01						
		238.63	5.964E-01	(P	9.884E-02	3.81E-02	G K
							Energy duplication
		77.11	6.557E-01	(	3.251E-01	1.04E-01	G
		74.81	7.389E-01	+ P	6.544E-01	2.03E-01	G
PB-214	3.8285E-01						
		351.99	3.715E-01	@(P	9.624E-02	3.73E-02	G K
		295.22	4.048E-01	(P	1.903E-01	6.46E-02	G
							Energy duplication
		77.11	1.059E+00	+ P	5.328E-01	1.70E-01	G
		241.92	-4.998E-03	% P	6.260E-01	1.85E-01	G
BI-212	4.7819E-01						
		727.17	4.782E-01	(P	2.810E-01	1.06E-01	G K
		1620.56	3.880E-01	%	1.138E+00	3.29E-01	G
		785.42	-4.043E-01	% P	2.249E+00	6.46E-01	G
BI-214	5.2436E-01						
		609.32	4.960E-01	@(P	1.013E-01	4.97E-02	G K
		1764.51	-7.560E-03	% P	2.942E-01	7.33E-02	G
		1120.28	6.113E-01	(P	3.290E-01	1.31E-01	G
RA-224	9.6013E-01						
		241.00	9.601E-01	&(P	1.133E+00	3.50E-01	G
RA-226	1.3520E+00						
		185.99	1.352E+00	(	9.264E-01	3.11E-01	G
AC-228	8.5796E-01						
		911.07	7.916E-01	(P	1.502E-01	8.10E-02	G K
		968.90	9.682E-01	(P	3.644E-01	1.72E-01	G
		338.40	6.617E-01	- P	3.009E-01	1.16E-01	G
TH-227	-2.0589E-01						
		236.00	-2.059E-01	%(P	4.289E-01	1.30E-01	G K
		256.25	-7.432E-03	& P	5.519E-01	1.62E-01	G
PA-234	5.6980E-02						
		98.44	5.698E-02	%(	1.713E-01	5.16E-02	G K
		946.00	4.116E-02	%	2.098E-01	5.99E-02	G
		131.28	1.007E-02	%	1.934E-01	5.75E-02	G
		94.67	-9.441E-02	%	3.213E-01	9.68E-02	G
		883.24	9.829E-02	%	3.702E-01	1.08E-01	G
		926.70	-5.940E-02	&	5.003E-01	1.43E-01	G

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 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26 1.325E-01 &   3.578E-01 1.07E-01 G

TH-234       1.0677E+00
                           63.29 9.437E-01 &(P 2.008E+00 6.07E-01 G K
                           92.80 1.229E+00 *(P 1.618E+00 4.95E-01 G
                           92.38 1.281E+00 % P 1.941E+00 5.91E-01 G

AM-241      -5.1810E-02
                           59.54-5.181E-02 %(P 2.686E-01 8.03E-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	-2.6880E-02	-2.8422E-02	2.6770E-01	2.6770E-01	2.959E-01
K-40		1.1919E+01	1.1919E+01	1.5890E+00	1.7259E+00	
MN-54	#A	-8.7903E-03	-8.8746E-03	4.7425E-02	4.7428E-02	4.770E-02
CO-57	#B	-4.0108E-04	-4.0553E-04	4.1983E-02	4.1983E-02	4.661E-02
CO-60	#B	1.5886E-02	1.5911E-02	4.5925E-02	4.5933E-02	5.240E-02

Sr-85	#A	-1.8192E-02	-1.9048E-02	5.1510E-02	5.1521E-02	5.481E-02
Kr-85	#A	-4.4474E+02	-4.4475E+02	1.2696E+03	1.2698E+03	1.270E+03
Y-88	#B	4.5702E-03	4.6998E-03	3.3663E-02	3.3664E-02	4.170E-02
NB-94	#B	3.4827E-03	3.4827E-03	2.9319E-02	2.9319E-02	3.537E-02
Ag-108M	#A	2.3111E-02	2.3112E-02	2.8567E-02	2.8597E-02	2.901E-02
CD-109	#A	1.2268E-01	1.2349E-01	1.2854E+00	1.2854E+00	1.424E+00
SN-113	#B	-2.4458E-03	-2.5099E-03	5.4661E-02	5.4661E-02	6.119E-02
SB-125	#F	1.2553E-01	1.2590E-01	1.0140E-01	1.0165E-01	1.049E-01
I-131	#B	-1.4477E-03	-2.0972E-03	5.4853E-02	5.4854E-02	4.359E-02
CS-134	#B	-6.6906E-04	-6.7171E-04	7.5088E-02	7.5088E-02	6.948E-02
CS-137	#A	2.3912E-02	2.3919E-02	5.0367E-02	5.0385E-02	5.587E-02
CE-139	#A	9.5538E-03	9.7631E-03	4.5303E-02	4.5306E-02	4.941E-02
EU-152	#B	3.0815E-02	3.0835E-02	1.0377E-01	1.0378E-01	1.153E-01
EU-154	#B	-2.3912E-02	-2.3935E-02	1.0020E-01	1.0021E-01	1.047E-01
EU-155	#B	1.1615E-02	1.1634E-02	1.5077E-01	1.5077E-01	1.679E-01
HG-203	#B	-1.0008E-02	-1.0669E-02	4.6758E-02	4.6762E-02	4.914E-02
TL-208		2.6964E-01	2.6964E-01	8.5304E-02	8.6654E-02	
PB-212	#	6.1352E-01	6.1352E-01	1.1752E-01	1.2253E-01	9.884E-02
PB-214	#	3.8285E-01	3.8285E-01	1.0836E-01	1.1050E-01	9.624E-02
BI-212		4.7819E-01	4.7819E-01	3.1676E-01	3.1791E-01	
BI-214		5.2436E-01	5.2436E-01	1.5741E-01	1.6018E-01	
RA-224	#A	9.6013E-01	9.6013E-01	1.0510E+00	1.0524E+00	1.133E+00
RA-226	#	1.3520E+00	1.3520E+00	9.3183E-01	9.3496E-01	
AC-228		8.5796E-01	8.5796E-01	2.6321E-01	2.6764E-01	
TH-227	#B	-2.0589E-01	-2.0589E-01	3.9643E-01	3.9660E-01	4.289E-01
PA-234	#B	5.6980E-02	5.6980E-02	1.5493E-01	1.5496E-01	1.713E-01
TH-234	#B	1.0677E+00	1.0677E+00	1.2157E+00	1.2172E+00	2.008E+00
AM-241	#A	-5.1809E-02	-5.1810E-02	2.5992E-01	2.5994E-01	2.686E-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 (262.6 to 1999.1 keV) 1.5401298E+01 pCi/gm
Total Decayed Activity (262.6 to 1999.1 keV) 1.5401304E+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_1AUG2006_1607.An1

Sample description
FSS-OOL-10-01-007-F

Spectrum Filename: C:\GammaVision\Spectra\101F_1AUG2006_1607.An1

Acquisition information
Start time: 01-Aug-2006 16:07:33
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: 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	28-Jul-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. 13 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.4803

***** 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	136.	23.23	1.00	1.651E-02				
74.42	136.	23.23	1.00	1.651E-02	74.81	9.600	PBC<MDA	PB212
77.61	226.	13.77	1.01	1.741E-02	77.11	10.700	7.980E-01	PB214
					77.11	17.500	4.961E-01	PB212
93.16	88.	34.61	1.15	1.993E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
186.43	124.	23.81	1.62	1.856E-02	185.99	3.280	1.338E+00	RA226
209.37	77.	37.97	1.23	1.721E-02				
238.97	606.	4.93	1.12	1.556E-02	238.63	43.100	5.894E-01	PB212
241.57	98.	25.78	1.12	1.542E-02	241.00	3.900	PBC<MDA	RA224
					241.92	7.470	PBC<MDA	PB214
270.51	52.	32.83	1.27	1.399E-02				
295.66	143.	12.77	1.16	1.290E-02	295.22	19.200	3.752E-01	PB214
300.43	42.	33.86	1.16	1.271E-02				
328.05	44.	35.70	1.53	1.169E-02				
338.66	110.	21.37	1.11	1.134E-02	338.40	12.010	5.209E-01	AC228
352.29	325.	9.16	1.37	1.092E-02	351.99	37.100	5.256E-01	PB214
463.42	36.	39.39	1.50	8.342E-03	463.51	10.000	PBC<MDA	SB125
511.40	125.	18.32	1.44	7.581E-03	510.72	22.500	4.210E-01	TL208
583.80	225.	10.18	1.37	6.677E-03	583.14	86.000	2.555E-01	TL208
609.79	210.	9.87	1.25	6.408E-03	609.32	46.090	4.668E-01	BI214
661.61	44.	33.56	1.29	5.938E-03				
661.61	44.	33.56	1.29	5.938E-03	661.62	84.620	5.664E-02	CS137
728.17	46.	25.78	1.40	5.436E-03	727.17	11.800	4.677E-01	BI212
795.49	23.	39.22	1.50	5.016E-03	795.76	85.400	PBC<MDA	CS134
911.87	143.	11.19	1.45	4.443E-03	911.07	29.000	7.212E-01	AC228
969.37	118.	17.85	1.76	4.210E-03	968.90	17.460	1.053E+00	AC228

1121.58	39.	37.32	1.99	3.711E-03	1120.28	15.040	4.601E-01	BI214
1461.94	715.	3.84	1.85	2.940E-03	1460.75	10.700	1.495E+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	
418.41	209.37	328.	77.	0.039	113.91	1.233	AC-228	
477.64	238.97	142.	606.	0.303	14.78	1.122	PB-212	D
482.83	241.57	270.	98.	0.049	77.33	1.124	PB-214	D
540.75	270.51	126.	52.	0.026	98.48	1.273	AC-228	
600.61	300.43	78.	42.	0.021	101.59	1.165	PB-212	lD
655.88	328.05	91.	44.	0.022	107.09	1.528	AC-228	s
704.38	352.29	396.	80.	0.040	110.56	1.373	PB-214	
1323.31	661.61	58.	44.	0.022	100.67	1.287	CS-137	l
3534.52	1766.54	3.	36.	0.018	57.74	1.541	XE-138	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	149.44	74.94	1000.	136.	0.068	97.90	1.499
PB-214	153.79	77.11	858.	261.	0.131	50.27	1.499D
PB-212	153.79	77.11	855.	265.	0.133	50.27	1.499D
TH-234	185.92	93.17	889.	104.	0.052	113.02	1.499s
TH-234	185.87	93.14	857.	111.	0.055	109.63	1.499s
RA-226	372.52	186.43	309.	124.	0.062	71.43	1.616s
PB-212	477.62	238.96	424.	521.	0.261	21.00	1.499
RA-224	483.73	242.02	440.	90.	0.045	102.61	1.499
PB-214	591.07	295.66	203.	131.	0.066	52.20	1.499
AC-228	677.11	338.66	165.	108.	0.054	64.10	1.107
PB-214	704.51	352.36	137.	243.	0.121	27.83	1.499
SB-125	926.73	463.42	91.	36.	0.018	118.18	1.499s
TL-208	1022.75	511.40	124.	109.	0.054	54.97	1.441s
TL-208	1167.61	583.80	83.	223.	0.111	30.54	1.373
BI-214	1219.63	609.79	66.	209.	0.105	29.61	1.250s
BI-212	1456.50	728.17	37.	46.	0.023	77.35	1.402s
CS-134	1591.20	795.49	30.	23.	0.011	117.66	1.502s
AC-228	1824.10	911.87	37.	141.	0.070	33.58	1.446
AC-228	1939.15	969.37	77.	117.	0.059	53.55	1.762
BI-214	2243.74	1121.58	57.	39.	0.019	111.95	1.986
K-40	2924.90	1461.94	12.	713.	0.357	11.53	1.849

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		1.4353E-01					
			477.56	1.435E-01	&(	2.847E-01 8.67E-02	G
K-40		1.4945E+01					
			1460.75	1.495E+01	(P	3.934E-01 5.77E-01	G
MN-54		-8.5015E-04					
			834.81	-8.502E-04	&(P	3.541E-02 9.54E-03	G
CO-57		3.0778E-03					
			122.07	3.078E-03	%(	4.591E-02 1.37E-02	G K
			136.43	8.220E-02	&	3.408E-01 1.02E-01	G
CO-60		6.2089E-03					
			1332.51	6.209E-03	%(P	5.067E-02 1.41E-02	G K
			1173.23	-3.472E-05	& P	6.788E-02 1.91E-02	G K
Sr-85		-7.1018E-03					
			514.00	-7.102E-03	%(	4.978E-02 1.46E-02	G
Kr-85		-1.8000E+02					
			513.99	-1.800E+02	%(P	1.102E+03 3.21E+02	G
Y-88		0.0000E+00					
			1836.01	0.000E+00	%(	2.105E-02 2.86E-03	G K
			898.02	9.998E-03	& P	4.662E-02 1.34E-02	G
NB-94		2.5684E-03					
			871.10	2.568E-03	&(P	3.495E-02 9.61E-03	G K
			702.50	5.063E-04	& P	4.421E-02 1.25E-02	G K
Ag-108M		1.6276E-02					
			722.95	1.628E-02	%(	4.207E-02 1.26E-02	G K
			614.37	-1.288E-02	% P	5.115E-02 1.51E-02	G
			433.93	-8.478E-03	&	3.922E-02 1.15E-02	G
CD-109		-4.2518E-03					
			88.04	-4.252E-03	%(P	1.373E+00 4.09E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SN-113	-9.9229E-03						
		391.71	-9.923E-03	&(	5.824E-02	1.71E-02	G K
		255.04	-4.509E-01	% P	1.656E+00	4.94E-01	G
SB-125	7.6911E-02						
		427.95	6.502E-03	&(P	1.190E-01	3.43E-02	G K
		600.77	-5.264E-02	% P	2.340E-01	6.85E-02	G
		636.15	-2.727E-03	% P	3.639E-01	1.02E-01	G
		463.51	2.853E-01	*(P	3.748E-01	1.17E-01	G
		176.29	-3.551E-02	% P	5.832E-01	1.72E-01	G
I-131	-9.6376E-03						
		364.48	-9.638E-03	&(	5.878E-02	1.72E-02	G K
		636.97	7.219E-02	%	4.751E-01	1.33E-01	G
		284.29	-5.819E-02	%	7.850E-01	2.30E-01	G
CS-134	1.4163E-02						
		604.66	-4.097E-03	%(P	4.173E-02	1.19E-02	G K
		795.76	3.503E-02	(P	4.354E-02	1.40E-02	G
		569.29	7.944E-02	% P	2.411E-01	7.15E-02	G
		801.84	-6.966E-03	%	4.169E-01	1.14E-01	G
CS-137	2.3606E-02						
							Energy duplication
		661.62	2.361E-02	%(P	5.229E-02	1.58E-02	G
CE-139	-2.7526E-03						
		165.85	-2.753E-03	%(P	4.768E-02	1.42E-02	G
EU-152	9.3226E-03						
		121.78	9.323E-03	%(P	1.363E-01	4.06E-02	G K
		344.30	-3.290E-02	% P	1.276E-01	3.77E-02	G
		1408.08	-6.679E-02	% P	2.402E-01	6.92E-02	G
		964.00	2.216E-01	& P	3.797E-01	1.17E-01	G
		1112.07	-3.952E-02	% P	4.078E-01	1.15E-01	G
		778.90	-2.730E-03	% P	3.225E-01	8.97E-02	G
EU-154	1.3594E-02						
		123.10	1.359E-02	%(P	9.707E-02	2.90E-02	G K
		1274.80	-2.759E-02	& P	1.561E-01	4.45E-02	G
		723.30	-8.754E-03	% P	3.664E-01	1.06E-01	G
		1004.80	-4.704E-02	& P	3.341E-01	9.60E-02	G
EU-155	-8.1952E-03						
		86.45	-8.195E-03	&(	1.386E-01	4.13E-02	G K
		105.31	6.608E-02	&	1.786E-01	5.39E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
HG-203	1.7146E-02						
		279.17	1.715E-02	%(	4.288E-02	1.29E-02	G K
		72.87	-5.386E-01	& P	1.143E+00	3.46E-01	G
		70.83	-7.072E-01	%	2.022E+00	6.10E-01	G
		82.50	-4.555E-02	&	2.443E+00	7.28E-01	G
TL-208	2.5553E-01						
		583.14	2.555E-01	(P	5.195E-02	2.63E-02	G
		510.72	4.210E-01	+ P	2.110E-01	8.86E-02	G
PB-212	5.3692E-01						
		238.63	5.125E-01	(P	9.699E-02	3.63E-02	G K
							Energy duplication
		77.11	5.811E-01	@(	3.045E-01	9.74E-02	G
		74.81	5.661E-01	&(P	6.237E-01	1.92E-01	G
PB-214	3.7932E-01						
		351.99	3.951E-01	(P	9.326E-02	3.69E-02	G K
		295.22	3.488E-01	(P	1.837E-01	6.15E-02	G
							Energy duplication
		77.11	9.371E-01	+ P	4.991E-01	1.59E-01	G
		241.92	-7.836E-03	% P	7.136E-01	2.12E-01	G
BI-212	4.6768E-01						
		727.17	4.677E-01	(P	3.209E-01	1.23E-01	G K
		1620.56	1.642E-01	%	1.276E+00	3.36E-01	G
		785.42	-8.479E-02	% P	2.606E+00	7.39E-01	G
BI-214	4.6515E-01						
		609.32	4.668E-01	@(P	9.051E-02	4.64E-02	G K
		1764.51	-7.312E-03	& P	2.846E-01	7.09E-02	G
		1120.28	4.601E-01	(P	4.483E-01	1.74E-01	G
RA-224	9.8924E-01						
		241.00	9.892E-01	(P	1.100E+00	3.41E-01	G
RA-226	1.3381E+00						
		185.99	1.338E+00	(	9.167E-01	3.19E-01	G
AC-228	7.2117E-01						
		911.07	7.212E-01	(P	1.590E-01	8.18E-02	G K
		968.90	1.053E+00	+ P	3.903E-01	1.89E-01	G
		338.40	5.209E-01	- P	3.032E-01	1.14E-01	G
TH-227	-2.3454E-01						
		236.00	-2.345E-01	%(P	4.420E-01	1.34E-01	G K
		256.25	-2.878E-03	% P	4.495E-01	1.31E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
PA-234	4.9156E-02						
		98.44	4.916E-02	%(	1.632E-01	4.91E-02	G K
		946.00	2.849E-02	%	2.705E-01	7.72E-02	G
		131.28	1.650E-02	&	1.870E-01	5.57E-02	G
		94.67	-7.859E-02	%	3.084E-01	9.27E-02	G
		883.24	3.381E-03	%	3.458E-01	9.53E-02	G
		926.70	-8.267E-02	&	4.305E-01	1.24E-01	G
		569.26	1.214E-01	%	3.551E-01	1.06E-01	G
TH-234	9.3347E-01						
		63.29	4.408E-01	%(P	2.045E+00	6.12E-01	G K
		92.80	1.222E+00	(P	1.538E+00	4.71E-01	G
		92.38	1.345E+00	(P	1.832E+00	5.59E-01	G
AM-241	8.7514E-03						
		59.54	8.751E-03	&(P	2.707E-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	

- -

***** 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	1.3567E-01	1.4353E-01	2.6022E-01	2.6035E-01	2.691E-01
K-40		1.4945E+01	1.4945E+01	1.7284E+00	1.9237E+00	
MN-54	#A	-8.4200E-04	-8.5015E-04	1.5111E-01	1.5111E-01	3.507E-02
CO-57	#B	3.0437E-03	3.0778E-03	4.1018E-02	4.1018E-02	4.541E-02
CO-60	#B	6.1992E-03	6.2089E-03	4.2368E-02	4.2369E-02	5.059E-02
Sr-85	#A	-6.7799E-03	-7.1018E-03	4.3727E-02	4.3729E-02	4.753E-02
Kr-85	#A	-1.8000E+02	-1.8000E+02	1.2592E+03	1.2592E+03	1.102E+03
Y-88	#B	0.0000E+00	0.0000E+00	8.5691E-03	8.5706E-03	2.047E-02
NB-94	#B	2.5683E-03	2.5684E-03	2.8832E-02	2.8832E-02	3.495E-02
Ag-108M	#B	1.6275E-02	1.6276E-02	3.7696E-02	3.7707E-02	4.206E-02
CD-109	#A	-4.2236E-03	-4.2518E-03	1.1507E+00	1.1507E+00	1.364E+00
SN-113	#B	-9.6670E-03	-9.9229E-03	5.1322E-02	5.1325E-02	5.674E-02
SB-125	#B	7.6683E-02	7.6911E-02	9.4547E-02	9.4647E-02	1.187E-01
I-131	#B	-6.6302E-03	-9.6376E-03	5.1703E-02	5.1706E-02	4.044E-02
CS-134	#B	1.4106E-02	1.4163E-02	1.6972E-02	1.6991E-02	4.156E-02
CS-137	#A	2.3600E-02	2.3606E-02	4.7259E-02	4.7278E-02	5.227E-02
CE-139	#A	-2.6930E-03	-2.7526E-03	4.7010E-02	4.7010E-02	4.665E-02
EU-152	#B	9.3166E-03	9.3226E-03	1.2181E-01	1.2181E-01	1.362E-01
EU-154	#B	1.3580E-02	1.3594E-02	8.6992E-02	8.6995E-02	9.698E-02
EU-155	#B	-8.1816E-03	-8.1952E-03	1.2391E-01	1.2391E-01	1.384E-01
HG-203	#B	1.6074E-02	1.7146E-02	3.8760E-02	3.8772E-02	4.020E-02
TL-208		2.5553E-01	2.5553E-01	7.8877E-02	8.0187E-02	
PB-212	#	5.3692E-01	5.3692E-01	1.1408E-01	1.1805E-01	9.699E-02
PB-214	#	3.7932E-01	3.7932E-01	1.0641E-01	1.0855E-01	9.326E-02
BI-212	#	4.6768E-01	4.6768E-01	3.6712E-01	3.6807E-01	
BI-214		4.6515E-01	4.6515E-01	1.3848E-01	1.4095E-01	
RA-224	#A	9.8924E-01	9.8924E-01	1.0231E+00	1.0247E+00	1.100E+00
RA-226	#	1.3381E+00	1.3381E+00	9.5582E-01	9.5881E-01	
AC-228		7.2117E-01	7.2117E-01	2.4535E-01	2.4871E-01	
TH-227	#B	-2.3454E-01	-2.3454E-01	4.0859E-01	4.0880E-01	4.420E-01
PA-234	#B	4.9156E-02	4.9156E-02	1.4738E-01	1.4741E-01	1.632E-01
TH-234	#B	9.3347E-01	9.3347E-01	1.0806E+00	1.0818E+00	2.045E+00
AM-241	#A	8.7513E-03	8.7514E-03	2.4148E-01	2.4148E-01	2.707E-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) 1.8192945E+01 pCi/gm
Total Decayed Activity (270.1 to 1999.1 keV) 1.8192953E+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_1AUG2006_1647.An1

Sample description
FSS-OOL-10-01-007-F-RC

Spectrum Filename: C:\GammaVision\Spectra\101F_1AUG2006_1647.An1

Acquisition information
Start time: 01-Aug-2006 16:48:00
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: 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	28-Jul-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: 0.5404

***** 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	185.	24.19	1.50	1.654E-02				
74.84	185.	24.19	1.50	1.654E-02	74.81	9.600	7.684E-01	PB212
77.10	226.	19.86	1.50	1.720E-02	77.11	10.700	8.085E-01	PB214
					77.11	17.500	PBC<MDA	PB212
77.10	229.	19.86	1.50	1.720E-02	77.11	10.700	8.085E-01	PB214
					77.11	17.500	5.025E-01	PB212
87.04	137.	20.57	1.01	1.920E-02	86.45	32.740	1.444E-01	EU155
					88.04	3.790	PBC<MDA	CD109
90.09	73.	38.10	1.02	1.960E-02				
93.26	109.	25.40	1.02	1.995E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
133.16	84.	32.73	1.22	2.102E-02	131.28	20.000	1.318E-01	PA234
186.55	117.	28.92	1.13	1.855E-02	185.99	3.280	1.269E+00	RA226
210.01	66.	39.77	1.34	1.717E-02				
239.00	563.	5.09	1.12	1.556E-02	238.63	43.100	5.478E-01	PB212
241.88	104.	19.10	1.12	1.540E-02	241.00	3.900	1.135E+00	RA224
					241.92	7.470	PBC<MDA	PB214
295.56	155.	16.36	1.49	1.291E-02	295.22	19.200	4.070E-01	PB214
338.69	105.	24.06	1.12	1.134E-02	338.40	12.010	4.958E-01	AC228
352.37	248.	9.60	1.17	1.091E-02	351.99	37.100	3.999E-01	PB214
511.87	99.	21.85	1.58	7.574E-03	510.72	22.500	3.210E-01	TL208
					513.99	0.004	1.992E+03	Kr85
					514.00	99.270	9.149E-02	Sr85
583.25	211.	9.83	1.44	6.683E-03	583.14	86.000	2.392E-01	TL208
609.68	168.	10.13	1.58	6.409E-03	609.32	46.090	3.717E-01	BI214
727.89	31.	35.39	1.25	5.438E-03	727.17	11.800	PBC<MDA	BI212
912.00	116.	11.23	1.18	4.443E-03	911.07	29.000	5.851E-01	AC228

969.36	92.	17.57	1.21	4.210E-03	968.90	17.460	8.199E-01	AC228
1121.48	52.	25.23	1.62	3.707E-03	1120.28	15.040	6.126E-01	BI214

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
1462.00	700.	3.84	1.76	2.940E-03	1460.75	10.700	1.462E+01	K40
1765.34	22.	21.32	1.67	2.481E-03	1764.51	15.920	3.602E-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	
173.65	87.16	326.	137.	0.068	61.72	1.014	PB-214	lD
179.76	90.21	352.	73.	0.037	114.31	1.016	PB-214	lD
419.69	210.01	266.	66.	0.033	119.30	1.342	NP-239	s
477.70	238.97	129.	563.	0.282	15.26	1.122	PB-212	D
483.46	241.85	147.	104.	0.052	57.31	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	149.24	74.84	968.	185.	0.092	72.56	1.499
PB-214	153.79	77.11	926.	226.	0.113	59.59	1.499D
PB-212	153.79	77.11	922.	229.	0.115	59.59	1.499D
TH-234	185.55	92.98	848.	110.	0.055	105.50	1.499s
TH-234	185.48	92.95	821.	114.	0.057	104.41	1.499s
RA-226	372.27	186.31	467.	97.	0.049	98.98	1.499
PB-212	477.57	238.94	403.	468.	0.234	22.54	1.499
RA-224	483.94	242.12	449.	81.	0.040	114.91	1.499
PB-214	590.98	295.62	209.	139.	0.070	50.22	1.499s
AC-228	677.16	338.69	185.	102.	0.051	72.19	1.120
PB-214	704.48	352.34	130.	213.	0.107	30.25	1.499
TL-208	1023.68	511.87	116.	83.	0.042	65.54	1.579s
TL-208	1166.50	583.25	71.	208.	0.104	29.48	1.440s
BI-214	1219.39	609.68	48.	166.	0.083	30.39	1.581s
BI-212	1455.93	727.89	38.	31.	0.015	106.17	1.252
AC-228	1824.35	912.00	23.	114.	0.057	33.69	1.185
AC-228	1939.13	969.36	47.	91.	0.046	52.72	1.209
BI-214	2243.54	1121.48	42.	52.	0.026	75.68	1.624
K-40	2925.01	1462.00	10.	698.	0.349	11.53	1.755
BI-214	3532.12	1765.34	0.	22.	0.011	63.96	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	Code	MDA Value pCi/gm		COMMENTS
BE-7		6.3951E-02						
			477.56	6.395E-02	&(	3.849E-01	1.12E-01	G
K-40		1.4623E+01						
			1460.75	1.462E+01	(P	3.699E-01	5.64E-01	G
MN-54		-9.3333E-03						
			834.81	-9.333E-03	%(P	4.742E-02	1.36E-02	G
CO-57		1.6526E-03						
			122.07	1.653E-03	&(	3.949E-02	1.17E-02	G K
			136.43	-1.147E-01	%	3.712E-01	1.12E-01	G
CO-60		4.1331E-03						
			1332.51	4.133E-03	%(P	5.474E-02	1.52E-02	G K
			1173.23	7.648E-03	& P	6.306E-02	1.80E-02	G K
Sr-85		1.7111E-03						
			514.00	1.711E-03	&(	4.638E-02	1.34E-02	G
Kr-85		1.5690E+01						
			513.99	1.569E+01	&(P	1.027E+03	2.95E+02	G
Y-88		0.0000E+00						
			1836.01	0.000E+00	%(	2.106E-02	2.86E-03	G K
			898.02	-1.119E-02	% P	5.158E-02	1.49E-02	G
NB-94		-6.5716E-05						
			871.10	-6.572E-05	&(P	3.697E-02	1.00E-02	G K
			702.50	1.222E-02	% P	4.635E-02	1.36E-02	G K
Ag-108M		6.9129E-03						
			722.95	6.913E-03	&(	4.489E-02	1.29E-02	G K
			614.37	9.252E-03	% P	4.531E-02	1.32E-02	G
			433.93	-4.085E-03	%	3.609E-02	1.04E-02	G
CD-109		-5.2526E-02						
			88.04	-5.253E-02	%(P	1.392E+00	4.15E-01	G
SN-113		1.0774E-04						
			391.71	1.077E-04	%(	5.137E-02	1.47E-02	G K
			255.04	4.722E-01	% P	1.699E+00	5.08E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	6.5256E-02						
		427.95	6.526E-02	&(P	1.030E-01	3.18E-02	G K
		600.77	-3.358E-03	& P	1.894E-01	5.29E-02	G
		636.15	-1.689E-03	% P	3.467E-01	9.71E-02	G
		463.51	2.014E-01	% P	3.226E-01	9.93E-02	G
		176.29	6.412E-02	% P	5.551E-01	1.65E-01	G
I-131	6.0159E-05						
		364.48	6.016E-05	%(	5.894E-02	1.70E-02	G K
		636.97	0.000E+00	%	7.200E-01	2.01E-01	G
		284.29	-1.382E-02	%	7.765E-01	2.26E-01	G
CS-134	-1.4748E-02						
		604.66	-1.475E-02	%(P	5.142E-02	1.52E-02	G K
		795.76	2.658E-02	& P	5.288E-02	1.61E-02	G
		569.29	-2.791E-03	& P	2.813E-01	8.00E-02	G
		801.84	-1.298E-01	%	5.050E-01	1.48E-01	G
CS-137	2.9603E-02						
		661.62	2.960E-02	%(P	4.178E-02	1.31E-02	G
CE-139	-9.0913E-03						
		165.85	-9.091E-03	%(P	4.432E-02	1.32E-02	G
EU-152	1.9242E-02						
		121.78	1.924E-02	%(P	1.124E-01	3.35E-02	G K
		344.30	-1.440E-02	% P	1.299E-01	3.79E-02	G
		1408.08	3.276E-02	% P	1.457E-01	4.00E-02	G
		964.00	7.777E-02	% P	3.430E-01	9.93E-02	G
		1112.07	-2.765E-02	& P	5.123E-01	1.46E-01	G
		778.90	-5.213E-02	% P	3.433E-01	9.85E-02	G
EU-154	-5.8676E-04						
		123.10	-5.868E-04	&(P	8.039E-02	2.37E-02	G K
		1274.80	8.060E-02	% P	1.367E-01	4.25E-02	G
		723.30	-2.229E-03	& P	3.367E-01	9.70E-02	G
		1004.80	-3.213E-02	% P	3.062E-01	8.70E-02	G
EU-155	1.2379E-02						
		86.45	1.238E-02	%(	1.604E-01	4.79E-02	G K
		105.31	1.451E-02	&	1.907E-01	5.69E-02	G
HG-203	-3.6527E-03						
		279.17	-3.653E-03	%(	4.376E-02	1.28E-02	G K
		72.87	-5.049E-01	% P	1.058E+00	3.20E-01	G
		70.83	-6.036E-01	%	1.941E+00	5.85E-01	G
		82.50	-8.181E-02	%	2.335E+00	6.96E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	2.3923E-01						
		583.14	2.392E-01	*(P	4.805E-02	2.38E-02	G
		510.72	3.210E-01	+ P	2.043E-01	8.37E-02	G
PB-212	4.7195E-01						
		238.63	4.596E-01	(P	9.457E-02	3.50E-02	G K
							Energy duplication
		77.11	5.025E-01	(	3.161E-01	9.98E-02	G
		74.81	7.684E-01	& P	6.137E-01	1.91E-01	G
PB-214	3.5492E-01						
		351.99	3.472E-01	(P	9.090E-02	3.53E-02	G K
		295.22	3.698E-01	(P	1.865E-01	6.27E-02	G
							Energy duplication
		77.11	8.085E-01	+ P	5.181E-01	1.63E-01	G
		241.92	4.518E-02	% P	6.892E-01	2.05E-01	G
BI-212	3.1357E-01						
		727.17	3.136E-01	(P	3.248E-01	1.14E-01	G K
		1620.56	-5.391E-03	%	1.259E+00	3.09E-01	G
		785.42	2.593E-01	% P	2.043E+00	5.80E-01	G
BI-214	3.6873E-01						
		609.32	3.717E-01	@(P	7.776E-02	3.79E-02	G K
		1764.51	3.602E-01	(P	1.231E-01	7.84E-02	G
		1120.28	6.126E-01	+ P	3.899E-01	1.56E-01	G
RA-224	8.8613E-01						
		241.00	8.861E-01	&(P	1.111E+00	3.42E-01	G
RA-226	1.0540E+00						
		185.99	1.054E+00	(	1.120E+00	3.48E-01	G
AC-228	5.5890E-01						
		911.07	5.851E-01	(P	1.274E-01	6.68E-02	G K
		968.90	8.199E-01	+ P	3.098E-01	1.45E-01	G
		338.40	4.958E-01	(P	3.196E-01	1.22E-01	G
TH-227	3.9834E-02						
		236.00	3.983E-02	%(P	4.090E-01	1.22E-01	G K
		256.25	5.014E-02	% P	4.484E-01	1.32E-01	G
PA-234	-3.9337E-02						
		98.44	-3.934E-02	%(	1.648E-01	4.95E-02	G K
		946.00	-3.627E-02	&	2.390E-01	6.83E-02	G
		131.28	-1.562E-02	&	1.824E-01	5.43E-02	G
		94.67	9.463E-04	%	2.521E-01	7.48E-02	G
		883.24	9.886E-02	%	3.154E-01	9.25E-02	G
		926.70	-1.008E-01	%	4.659E-01	1.35E-01	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26 0.000E+00 &   4.146E-01 1.18E-01 G

TH-234       9.0079E-01
                           63.29 2.833E-01 &(P 2.011E+00 6.00E-01 G K
                           92.80 1.261E+00  (P 1.506E+00 4.62E-01 G
                           92.38 1.418E+00  (P 1.790E+00 5.48E-01 G

AM-241      -2.0458E-03
                           59.54-2.046E-03 %(P 2.644E-01 7.84E-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	6.0427E-02	6.3951E-02	3.3700E-01	3.3701E-01	3.637E-01
K-40		1.4623E+01	1.4623E+01	1.6917E+00	1.8827E+00	
MN-54	#A	-9.2433E-03	-9.3333E-03	4.6348E-02	4.6351E-02	4.697E-02
CO-57	#B	1.6342E-03	1.6526E-03	3.5125E-02	3.5125E-02	3.905E-02
CO-60	#B	4.1266E-03	4.1331E-03	4.5541E-02	4.5542E-02	5.465E-02

Sr-85	#A	1.6330E-03	1.7111E-03	4.0128E-02	4.0128E-02	4.427E-02
Kr-85	#A	1.5689E+01	1.5690E+01	8.8387E+02	8.8387E+02	1.027E+03
Y-88	#B	0.0000E+00	0.0000E+00	8.5707E-03	8.5722E-03	2.047E-02
NB-94	#B	-6.5716E-05	-6.5716E-05	6.1862E-02	6.1862E-02	3.697E-02
Ag-108M	#B	6.9125E-03	6.9129E-03	3.8665E-02	3.8667E-02	4.488E-02
CD-109	#A	-5.2176E-02	-5.2526E-02	1.4655E+00	1.4655E+00	1.382E+00
SN-113	#B	1.0495E-04	1.0774E-04	4.4131E-02	4.4131E-02	5.003E-02
SB-125	#B	6.5061E-02	6.5256E-02	9.5520E-02	9.5592E-02	1.027E-01
I-131	#B	4.1286E-05	6.0159E-05	5.0898E-02	5.0898E-02	4.045E-02
CS-134	#B	-1.4689E-02	-1.4748E-02	4.9766E-02	4.9773E-02	5.121E-02
CS-137	#A	2.9595E-02	2.9603E-02	3.9333E-02	3.9368E-02	4.177E-02
CE-139	#A	-8.8933E-03	-9.0913E-03	4.0964E-02	4.0967E-02	4.336E-02
EU-152	#B	1.9230E-02	1.9242E-02	1.0055E-01	1.0055E-01	1.123E-01
EU-154	#B	-5.8618E-04	-5.8676E-04	7.8087E-01	7.8087E-01	8.032E-02
EU-155	#B	1.2358E-02	1.2379E-02	1.4382E-01	1.4383E-01	1.601E-01
HG-203	#B	-3.4230E-03	-3.6527E-03	3.8550E-02	3.8550E-02	4.101E-02
TL-208	#	2.3923E-01	2.3923E-01	7.1325E-02	7.2595E-02	
PB-212	#	4.7195E-01	4.7195E-01	1.0777E-01	1.1102E-01	9.457E-02
PB-214	#	3.5492E-01	3.5492E-01	1.0528E-01	1.0717E-01	9.090E-02
BI-212	A	3.1357E-01	3.1357E-01	3.4032E-01	3.4078E-01	
BI-214		3.6873E-01	3.6873E-01	1.1280E-01	1.1471E-01	
RA-224	#A	8.8613E-01	8.8613E-01	1.0272E+00	1.0285E+00	1.111E+00
RA-226	#A	1.0540E+00	1.0540E+00	1.0433E+00	1.0450E+00	1.120E+00
AC-228		5.5890E-01	5.5890E-01	1.9137E-01	1.9395E-01	
TH-227	#B	3.9834E-02	3.9834E-02	3.6485E-01	3.6486E-01	4.090E-01
PA-234	#B	-3.9337E-02	-3.9337E-02	1.4843E-01	1.4845E-01	1.648E-01
TH-234	#B	9.0079E-01	9.0079E-01	9.9147E-01	9.9273E-01	2.011E+00
AM-241	#A	-2.0458E-03	-2.0458E-03	5.9012E+00	5.9012E+00	2.644E-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) 1.6103054E+01 pCi/gm
Total Decayed Activity (270.6 to 1999.1 keV) 1.6103054E+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_1AUG2006_1724.An1

Sample description
FSS-OOL-10-01-023-F

Spectrum Filename: C:\GammaVision\Spectra\101F_1AUG2006_1724.An1

Acquisition information
Start time: 01-Aug-2006 17:24:33
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: 1.8240E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.8240E+03) =
5.4825E+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	28-Jul-2006 10:00:00
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. 13 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.4333

***** 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
74.36	151.	21.28	1.00	1.651E-02				
74.36	151.	21.28	1.00	1.651E-02	74.81	9.600	PBC<MDA	PB212
77.38	305.	9.95	1.01	1.737E-02	77.11	10.700	1.212E+00	PB214
					77.11	17.500	7.503E-01	PB212
84.61	75.	33.88	1.01	1.883E-02				
84.61	75.	33.88	1.01	1.883E-02	86.45	32.740	8.938E-02	EU155
87.09	128.	20.95	1.01	1.922E-02				
90.14	117.	22.15	1.02	1.962E-02	88.04	3.790	PBC<MDA	CD109
93.18	145.	18.63	1.02	1.995E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	1.725E+00	TH234
129.35	114.	33.30	0.93	2.109E-02				
185.89	87.	27.08	1.15	1.859E-02	185.99	3.280	1.058E+00	RA226
209.02	97.	28.83	1.29	1.723E-02				
238.98	693.	4.35	1.12	1.556E-02	238.63	43.100	7.581E-01	PB212
241.73	94.	26.41	1.12	1.541E-02	241.00	3.900	PBC<MDA	RA224
					241.92	7.470	PBC<MDA	PB214
270.93	83.	25.90	1.10	1.397E-02				
295.61	123.	14.20	1.28	1.290E-02	295.22	19.200	3.620E-01	PB214
300.85	49.	34.32	1.56	1.269E-02				
338.73	124.	16.98	1.13	1.134E-02	338.40	12.010	6.621E-01	AC228
352.28	242.	10.81	1.21	1.092E-02	351.99	37.100	4.391E-01	PB214
463.40	66.	22.22	1.49	8.344E-03				
463.40	66.	22.22	1.49	8.344E-03	463.51	10.000	5.706E-01	SB125
510.89	100.	16.19	1.65	7.590E-03	510.72	22.500	4.324E-01	TL208
583.77	212.	8.34	1.12	6.678E-03	583.14	86.000	2.708E-01	TL208
609.79	171.	9.72	1.63	6.408E-03	609.32	46.090	4.249E-01	BI214
727.65	82.	18.33	1.15	5.440E-03	727.17	11.800	9.381E-01	BI212

911.86	118.	12.54	1.86	4.443E-03	911.07	29.000	6.649E-01	AC228
969.01	100.	15.01	1.71	4.212E-03	968.90	17.460	1.004E+00	AC228
1121.46	72.	25.18	1.77	3.711E-03	1120.28	15.040	9.573E-01	BI214
1461.96	609.	4.15	1.85	2.940E-03	1460.75	10.700	1.428E+01	K40
1765.90	15.	29.60	1.48	2.481E-03	1764.51	15.920	2.769E-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	
168.79	84.80	288.	75.	0.038	101.63	1.012	BI-207	lD
173.76	87.28	293.	128.	0.064	62.84	1.014	PB-214	lD
179.93	90.33	366.	73.	0.037	116.41	1.016	PB-214	D
186.02	93.37	312.	132.	0.066	62.63	1.018	U-235	D
258.32	129.35	524.	121.	0.060	84.81	0.929	AC-228	s
417.72	209.02	284.	97.	0.048	86.49	1.285	AC-228	s
477.67	238.96	109.	693.	0.347	13.06	1.122	PB-212	D
483.17	241.70	259.	94.	0.047	79.22	1.124	PB-214	D
541.58	270.93	160.	83.	0.042	77.69	1.098	AC-228	s
601.45	300.85	104.	49.	0.024	102.97	1.562	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	149.11	74.77	965.	174.	0.087	76.65	1.499
PB-214	153.79	77.11	908.	257.	0.128	52.43	1.499D
PB-212	153.79	77.11	904.	260.	0.130	52.43	1.499D
TH-234	185.99	93.21	783.	143.	0.071	83.01	1.499
RA-226	371.43	185.89	234.	87.	0.043	81.24	1.146s
PB-212	477.61	238.95	367.	551.	0.275	19.26	1.499
PB-214	590.98	295.62	149.	128.	0.064	47.47	1.499
AC-228	677.25	338.73	135.	122.	0.061	50.93	1.135
PB-214	704.65	352.43	124.	199.	0.099	31.52	1.499
SB-125	926.18	463.14	52.	45.	0.023	78.30	1.499s
TL-208	1021.71	510.89	87.	100.	0.050	48.58	1.652s
TL-208	1167.56	583.77	43.	210.	0.105	25.01	1.118
BI-214	1219.61	609.79	45.	169.	0.085	29.15	1.628s
BI-212	1455.45	727.65	49.	81.	0.041	55.00	1.148s
AC-228	1824.06	911.86	40.	116.	0.058	37.62	1.864
AC-228	1938.44	969.01	40.	100.	0.050	45.03	1.708
BI-214	2243.51	1121.46	56.	72.	0.036	75.55	1.771s
K-40	2924.94	1461.96	9.	607.	0.303	12.45	1.855
BI-214	3533.24	1765.90	2.	15.	0.007	88.79	1.481s

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		7.9454E-03					
			477.56	7.945E-03	&(	4.086E-01 1.17E-01	G
K-40		1.4282E+01					
			1460.75	1.428E+01	(P	3.942E-01 5.95E-01	G
MN-54		-6.5884E-03					
			834.81	-6.588E-03	&(P	4.940E-02 1.40E-02	G
CO-57		-4.3959E-03					
			122.07	-4.396E-03	%(	4.958E-02 1.48E-02	G K
			136.43	-7.044E-02	&	4.035E-01 1.21E-01	G
CO-60		-3.4372E-04					
			1332.51	-3.437E-04	&(P	5.557E-02 1.49E-02	G K
			1173.23	3.092E-02	& P	6.315E-02 1.92E-02	G K
Sr-85		-2.0442E-02					
			514.00	-2.044E-02	%(	6.173E-02 1.85E-02	G
Kr-85		-4.7752E+02					
			513.99	-4.775E+02	%(P	1.366E+03 4.07E+02	G
Y-88		4.2171E-04					
			1836.01	4.217E-04	%(	4.773E-02 1.19E-02	G K
			898.02	1.595E-02	% P	5.496E-02 1.61E-02	G
NB-94		-1.0782E-03					
			871.10	-1.078E-03	&(P	4.344E-02 1.19E-02	G K
			702.50	2.373E-02	% P	4.692E-02 1.43E-02	G K
Ag-108M		-7.1103E-03					
			722.95	-7.110E-03	%(	5.967E-02 1.72E-02	G K
			614.37	-2.892E-02	% P	6.103E-02 1.85E-02	G
			433.93	1.452E-03	%	4.117E-02 1.18E-02	G
CD-109		1.1455E-01					
			88.04	1.145E-01	&(P	1.545E+00 4.62E-01	G
SN-113		2.5636E-03					
			391.71	2.564E-03	&(	6.796E-02 1.97E-02	G K
			255.04	-6.909E-02	% P	1.911E+00 5.61E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	7.8182E-02						
		427.95	-3.137E-02	&(P	1.394E-01	4.10E-02	G K
		600.77	6.684E-02	% P	2.101E-01	6.20E-02	G
		636.15	-6.494E-02	% P	3.787E-01	1.09E-01	G
		463.51	4.025E-01	*(P	3.240E-01	1.08E-01	G
		176.29	-1.218E-01	% P	6.577E-01	1.96E-01	G
I-131	2.0786E-02						
		364.48	2.079E-02	%(	6.048E-02	1.81E-02	G K
		636.97	-1.501E-01	%	8.207E-01	2.37E-01	G
		284.29	-2.746E-01	%	9.453E-01	2.82E-01	G
CS-134	-1.4952E-02						
		604.66	-1.495E-02	%(P	5.651E-02	1.66E-02	G K
		795.76	2.475E-02	% P	5.834E-02	1.75E-02	G
		569.29	-6.107E-05	& P	2.997E-01	8.50E-02	G
		801.84	-9.797E-03	&	4.730E-01	1.30E-01	G
CS-137	-7.6993E-03						
		661.62	-7.699E-03	%(P	5.847E-02	1.67E-02	G
CE-139	-1.5306E-02						
		165.85	-1.531E-02	%(P	5.148E-02	1.55E-02	G
EU-152	-1.0578E-02						
		121.78	-1.058E-02	%(P	1.421E-01	4.22E-02	G K
		344.30	1.222E-02	& P	1.458E-01	4.25E-02	G
		1408.08	-3.092E-02	% P	2.855E-01	7.90E-02	G
		964.00	-2.484E-03	% P	4.094E-01	1.14E-01	G
		1112.07	-3.871E-02	% P	4.456E-01	1.25E-01	G
		778.90	4.919E-03	% P	3.427E-01	9.51E-02	G
EU-154	-9.7193E-03						
		123.10	-9.719E-03	%(P	1.017E-01	3.03E-02	G K
		1274.80	-2.196E-02	% P	1.876E-01	5.31E-02	G
		723.30	-4.335E-02	% P	2.790E-01	8.05E-02	G
		1004.80	-3.515E-02	& P	3.077E-01	8.69E-02	G
EU-155	6.6384E-02						
		86.45	6.638E-02	%(	1.467E-01	4.45E-02	G K
		105.31	4.574E-02	%	1.983E-01	5.95E-02	G
HG-203	-1.5784E-02						
		279.17	-1.578E-02	&(	4.332E-02	1.30E-02	G K
		72.87	-4.966E-01	% P	1.268E+00	3.83E-01	G
		70.83	4.711E-01	%	2.052E+00	6.16E-01	G
		82.50	-1.243E+00	%	2.699E+00	8.18E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	2.7080E-01						
		583.14	2.708E-01	(P	4.282E-02	2.29E-02	G
		510.72	4.324E-01	+ P	2.007E-01	8.13E-02	G
PB-212	6.1732E-01						
		238.63	6.079E-01	(P	1.015E-01	3.95E-02	G K
							Energy duplication
		77.11	6.405E-01	(	3.515E-01	1.12E-01	G
		74.81	8.121E-01	& P	6.881E-01	2.14E-01	G
PB-214	3.7032E-01						
		351.99	3.637E-01	(P	9.997E-02	3.86E-02	G K
		295.22	3.832E-01	(P	1.777E-01	6.15E-02	G
							Energy duplication
		77.11	1.033E+00	+ P	5.761E-01	1.83E-01	G
		241.92	1.234E-01	% P	6.807E-01	2.03E-01	G
BI-212	9.3807E-01						
		727.17	9.381E-01	*(P	4.063E-01	1.74E-01	G K
		1620.56	-2.215E-02	%	1.966E+00	5.16E-01	G
		785.42	-1.840E-02	% P	2.110E+00	5.78E-01	G
BI-214	4.2486E-01						
		609.32	4.249E-01	(P	8.472E-02	4.16E-02	G K
		1764.51	2.769E-01	- P	1.816E-01	8.44E-02	G
		1120.28	9.573E-01	+ P	4.984E-01	2.43E-01	G
RA-224	8.7995E-01						
		241.00	8.799E-01	%(P	1.241E+00	3.81E-01	G
RA-226	1.0575E+00						
		185.99	1.058E+00	*(	8.994E-01	2.86E-01	G
AC-228	6.6411E-01						
		911.07	6.649E-01	(P	1.855E-01	8.48E-02	G K
		968.90	1.004E+00	+ P	3.254E-01	1.52E-01	G
		338.40	6.621E-01	(P	3.092E-01	1.15E-01	G
TH-227	-7.7454E-02						
		236.00	-7.745E-02	&(P	4.339E-01	1.29E-01	G K
		256.25	1.776E-01	& P	5.445E-01	1.63E-01	G
PA-234	4.5079E-03						
		98.44	4.508E-03	&(	1.757E-01	5.22E-02	G K
		946.00	6.698E-03	%	1.873E-01	5.03E-02	G
		131.28	-1.236E-02	%	2.232E-01	6.64E-02	G
		94.67	-1.265E-01	%	3.160E-01	9.55E-02	G
		883.24	5.643E-02	&	3.685E-01	1.04E-01	G
		926.70	1.298E-01	&	4.428E-01	1.30E-01	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26 2.679E-03 &   4.419E-01 1.26E-01 G

TH-234       1.1579E+00
                           63.29 6.836E-01 %(P 2.121E+00 6.37E-01 G K
                           92.80 1.775E+00  (P 1.652E+00 5.12E-01 G
                           92.38-8.036E-02 & P 1.990E+00 5.89E-01 G

AM-241       1.2583E-01
                           59.54 1.258E-01 %(P 2.690E-01 8.15E-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	7.5133E-03	7.9454E-03	3.4979E-01	3.4979E-01	3.864E-01
K-40		1.4282E+01	1.4282E+01	1.7847E+00	1.9586E+00	
MN-54	#A	-6.5257E-03	-6.5884E-03	5.1100E-02	5.1102E-02	4.893E-02
CO-57	#B	-4.3476E-03	-4.3959E-03	4.4300E-02	4.4301E-02	4.903E-02
CO-60	#B	-3.4319E-04	-3.4372E-04	1.7190E-01	1.7190E-01	5.548E-02

Sr-85	#A	-1.9522E-02	-2.0442E-02	5.5396E-02	5.5408E-02	5.895E-02
Kr-85	#A	-4.7751E+02	-4.7752E+02	1.3669E+03	1.3672E+03	1.366E+03
Y-88	#B	4.1005E-04	4.2171E-04	3.5712E-02	3.5712E-02	4.641E-02
NB-94	#B	-1.0782E-03	-1.0782E-03	5.3311E-02	5.3311E-02	4.344E-02
Ag-108M	#B	-7.1099E-03	-7.1103E-03	5.1570E-02	5.1572E-02	5.967E-02
CD-109	#A	1.1379E-01	1.1455E-01	1.3853E+00	1.3853E+00	1.535E+00
SN-113	#B	2.4980E-03	2.5636E-03	5.9135E-02	5.9135E-02	6.622E-02
SB-125	#B	7.7952E-02	7.8182E-02	6.3180E-02	6.3334E-02	1.390E-01
I-131	#B	1.4337E-02	2.0786E-02	5.4178E-02	5.4191E-02	4.171E-02
CS-134	#B	-1.4893E-02	-1.4952E-02	5.5037E-02	5.5044E-02	5.629E-02
CS-137	#A	-7.6972E-03	-7.6993E-03	7.0534E-02	7.0535E-02	5.846E-02
CE-139	#A	-1.4977E-02	-1.5306E-02	4.7344E-02	4.7351E-02	5.037E-02
EU-152	#B	-1.0571E-02	-1.0578E-02	1.5145E-01	1.5145E-01	1.420E-01
EU-154	#B	-9.7100E-03	-9.7193E-03	1.0689E-01	1.0689E-01	1.016E-01
EU-155	#B	6.6274E-02	6.6384E-02	1.3335E-01	1.3340E-01	1.465E-01
HG-203	#B	-1.4803E-02	-1.5784E-02	3.9003E-02	3.9013E-02	4.063E-02
TL-208		2.7080E-01	2.7080E-01	6.8484E-02	7.0173E-02	
PB-212	#	6.1732E-01	6.1732E-01	1.2022E-01	1.2518E-01	1.015E-01
PB-214	#	3.7032E-01	3.7032E-01	1.0684E-01	1.0887E-01	9.997E-02
BI-212	#	9.3807E-01	9.3807E-01	5.2024E-01	5.2293E-01	
BI-214		4.2486E-01	4.2486E-01	1.2465E-01	1.2694E-01	
RA-224	#A	8.7995E-01	8.7995E-01	1.1424E+00	1.1435E+00	1.241E+00
RA-226	#	1.0575E+00	1.0575E+00	8.5907E-01	8.6115E-01	
AC-228		6.6411E-01	6.6411E-01	2.1389E-01	2.1716E-01	
TH-227	#B	-7.7454E-02	-7.7454E-02	4.0701E-01	4.0703E-01	4.339E-01
PA-234	#B	4.5079E-03	4.5079E-03	1.5656E-01	1.5656E-01	1.757E-01
TH-234	#B	1.1579E+00	1.1579E+00	1.0027E+00	1.0048E+00	2.121E+00
AM-241	#A	1.2583E-01	1.2583E-01	2.4452E-01	2.4462E-01	2.690E-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) 1.7637060E+01 pCi/gm
Total Decayed Activity (270.6 to 1999.1 keV) 1.7637066E+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_1AUG2006_2012.An1

Sample description
FSS-OOL-10-01-018-F

Spectrum Filename: C:\GammaVision\Spectra\101F_1AUG2006_2012.An1

Acquisition information
Start time: 01-Aug-2006 20:12:30
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: 1.9330E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.9330E+03) =
5.1733E+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	28-Jul-2006 08:40:00
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: 0.4539

***** 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	184.	23.47	1.50	1.654E-02				
74.91	184.	23.47	1.50	1.654E-02	74.81	9.600	8.115E-01	PB212
77.06	306.	14.12	1.50	1.720E-02	77.11	10.700	1.164E+00	PB214
					77.11	17.500	7.115E-01	PB212
77.06	310.	14.12	1.50	1.720E-02	77.11	10.700	1.164E+00	PB214
					77.11	17.500	7.201E-01	PB212
83.95	64.	39.70	1.01	1.873E-02				
87.49	119.	23.27	1.01	1.928E-02				
87.49	119.	23.27	1.01	1.928E-02	88.04	3.790	PBC<MDA	CD109
89.81	77.	33.05	1.02	1.958E-02				
93.11	131.	21.00	1.02	1.995E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
130.12	86.	37.85	1.15	2.108E-02				
130.12	86.	37.85	1.15	2.108E-02	131.28	20.000	1.424E-01	PA234
186.12	90.	35.04	1.00	1.858E-02	185.99	3.280	1.030E+00	RA226
209.44	91.	25.84	1.12	1.721E-02				
232.15	51.	35.54	1.50	1.572E-02	236.00	11.200	PBC<MDA	TH227
238.98	635.	4.66	1.12	1.556E-02	238.63	43.100	6.548E-01	PB212
241.58	105.	23.40	1.12	1.542E-02	241.00	3.900	1.211E+00	RA224
					241.92	7.470	PBC<MDA	PB214
270.61	58.	27.97	1.36	1.399E-02				
295.56	132.	12.97	1.16	1.290E-02	295.22	19.200	3.675E-01	PB214
300.29	38.	36.39	1.16	1.271E-02				
328.36	44.	33.16	1.06	1.168E-02				
338.67	178.	16.31	1.09	1.134E-02	338.40	12.010	9.017E-01	AC228
352.43	273.	8.61	1.09	1.091E-02	351.99	37.100	4.680E-01	PB214
410.59	36.	39.96	1.44	9.395E-03				

463.83	55.	24.27	1.07	8.336E-03	463.51	10.000	4.519E-01	SB125
511.12	105.	19.18	1.60	7.585E-03	510.72	22.500	3.650E-01	TL208
583.76	190.	9.27	1.16	6.678E-03	583.14	86.000	2.282E-01	TL208
609.73	174.	11.07	1.15	6.409E-03	609.32	46.090	4.085E-01	BI214
727.96	59.	26.96	0.94	5.438E-03	727.17	11.800	6.392E-01	BI212
795.23	61.	17.54	0.98	5.019E-03				
795.23	61.	17.54	0.98	5.019E-03	795.76	85.400	9.961E-02	CS134
911.94	116.	12.12	1.64	4.443E-03	911.07	29.000	6.209E-01	AC228
969.43	95.	15.89	1.40	4.210E-03	968.90	17.460	8.981E-01	AC228
1121.08	52.	25.40	1.14	3.711E-03	1120.28	15.040	6.466E-01	BI214

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
1461.96	568.	4.34	1.86	2.940E-03	1460.75	10.700	1.255E+01	K40
1766.13	13.	35.86	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	
167.47	84.16	286.	64.	0.032	119.11	1.011	TA-182	lD
174.57	87.70	324.	119.	0.060	69.82	1.014	PB-214	lD
179.19	90.02	289.	77.	0.039	99.14	1.016	PB-214	lD
259.85	130.12	421.	86.	0.043	113.55	1.151	AC-228	l
418.56	209.44	220.	91.	0.045	77.53	1.116	AC-228	s
477.66	238.87	121.	635.	0.317	13.99	1.122	PB-212	D
482.87	241.47	250.	105.	0.053	70.19	1.124	PB-214	D
540.95	270.61	108.	58.	0.029	83.91	1.362	AC-228	
600.43	300.34	104.	42.	0.021	116.78	1.288	PB-212	
656.49	328.36	82.	44.	0.022	99.48	1.063	RH-106M	
821.04	410.59	70.	36.	0.018	119.88	1.441	EU-152	s
1022.18	511.12	147.	47.	0.024	117.40	1.602	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	900.	184.	0.092	70.40	1.499
PB-214	153.79	77.11	807.	306.	0.153	42.35	1.499D
PB-212	153.79	77.11	803.	310.	0.155	42.35	1.499D
TH-234	186.13	93.27	798.	132.	0.066	90.33	1.499s
RA-226	372.37	186.36	480.	91.	0.045	106.99	1.499
TH-227	464.00	232.15	139.	51.	0.025	106.63	1.499s
PB-212	477.70	239.00	333.	552.	0.276	18.70	1.499
RA-224	482.97	241.64	394.	97.	0.048	91.56	1.499
PB-214	591.04	295.65	173.	138.	0.069	47.20	1.499
AC-228	677.12	338.67	192.	176.	0.088	48.93	1.092s
PB-214	704.56	352.38	119.	239.	0.120	27.14	1.499
SB-125	926.91	463.51	53.	46.	0.023	77.98	1.499s
TL-208	1022.66	511.36	105.	52.	0.026	68.88	1.499s
TL-208	1167.42	583.70	51.	179.	0.090	27.61	1.499
BI-214	1219.49	609.73	71.	173.	0.086	33.22	1.155

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
BI-212	1456.07	727.96	62.	59.	0.029	80.89	0.940s
CS-134	1591.36	795.57	33.	37.	0.018	81.20	1.502s
AC-228	1824.24	911.94	32.	115.	0.057	36.36	1.639
AC-228	1939.27	969.43	43.	94.	0.047	47.68	1.399
BI-214	2242.75	1121.08	35.	52.	0.026	76.21	1.137s
K-40	2924.94	1461.96	12.	565.	0.283	13.01	1.856
BI-214	3533.69	1766.13	5.	13.	0.006	107.58	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		-1.5289E-02					
			477.56	-1.529E-02	&(	3.563E-01 1.01E-01	G
K-40		1.2555E+01					
			1460.75	1.255E+01	(P	4.123E-01 5.47E-01	G
MN-54		2.0204E-02					
			834.81	2.020E-02	%(P	4.427E-02 1.34E-02	G
CO-57		-1.5402E-02					
			122.07	-1.540E-02	&(	4.348E-02 1.31E-02	G K
			136.43	-3.776E-02	&	3.750E-01 1.12E-01	G
CO-60		6.9744E-03					
			1332.51	6.974E-03	%(P	4.818E-02 1.34E-02	G K
			1173.23	1.552E-02	% P	6.174E-02 1.80E-02	G K
Sr-85		-1.0218E-02					
			514.00	-1.022E-02	%(	5.204E-02 1.53E-02	G
Kr-85		-2.5018E+02					
			513.99	-2.502E+02	%(P	1.151E+03 3.37E+02	G
Y-88		0.0000E+00					
			1836.01	0.000E+00	&(	2.232E-02 3.03E-03	G K
			898.02	6.683E-04	% P	5.378E-02 1.49E-02	G
NB-94		-2.0147E-04					
			871.10	-2.015E-04	&(P	5.248E-02 1.47E-02	G K
			702.50	5.987E-04	& P	3.674E-02 1.02E-02	G K

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
Ag-108M	1.1056E-02						
		722.95	1.106E-02	%(	4.788E-02	1.39E-02	G K
		614.37	-1.058E-02	% P	5.574E-02	1.63E-02	G
		433.93	4.370E-03	%	3.623E-02	1.05E-02	G
CD-109	7.2669E-01						
		88.04	7.267E-01	%(P	1.280E+00	3.89E-01	G
SN-113	1.2078E-02						
		391.71	1.208E-02	%(	5.808E-02	1.71E-02	G K
		255.04	-4.378E-03	% P	1.829E+00	5.36E-01	G
SB-125	1.1289E-01						
		427.95	2.094E-02	%(P	1.236E-01	3.61E-02	G K
		600.77	4.795E-02	% P	1.658E-01	4.84E-02	G
		636.15	1.210E-01	% P	3.317E-01	9.86E-02	G
		463.51	3.851E-01	*(P	3.087E-01	1.03E-01	G
		176.29	-6.681E-03	% P	6.052E-01	1.79E-01	G
I-131	1.2621E-03						
		364.48	1.262E-03	&(	5.930E-02	1.71E-02	G K
		636.97	2.799E-01	%	7.103E-01	2.12E-01	G
		284.29	-2.378E-01	%	8.293E-01	2.47E-01	G
CS-134	2.6915E-02						
		604.66	-2.573E-03	&(P	4.495E-02	1.27E-02	G K
		795.76	6.062E-02	*(P	4.829E-02	1.66E-02	G
		569.29	3.577E-02	% P	2.697E-01	7.78E-02	G
		801.84	9.765E-02	%	4.282E-01	1.23E-01	G
CS-137	2.6764E-02						
		661.62	2.676E-02	%(P	5.416E-02	1.64E-02	G
CE-139	-2.0839E-03						
		165.85	-2.084E-03	%(P	4.908E-02	1.45E-02	G
EU-152	3.3532E-02						
		121.78	3.353E-02	%(P	1.209E-01	3.63E-02	G K
		344.30	-4.214E-02	% P	1.370E-01	4.07E-02	G
		1408.08	-1.995E-02	% P	2.244E-01	6.05E-02	G
		964.00	1.304E-01	% P	4.028E-01	1.19E-01	G
		1112.07	4.890E-03	% P	3.957E-01	1.09E-01	G
		778.90	-2.826E-02	% P	3.556E-01	1.01E-01	G
EU-154	1.2410E-04						
		123.10	1.241E-04	&(P	9.849E-02	2.92E-02	G K
		1274.80	7.093E-02	& P	1.482E-01	4.50E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
		723.30	-1.480E-01	& P	3.305E-01	9.97E-02	G
		1004.80	1.169E-02	& P	2.582E-01	7.11E-02	G
EU-155	5.5245E-03						
		86.45	5.525E-03	&(	1.402E-01	4.17E-02	G K
		105.31	3.993E-02	%	1.812E-01	5.43E-02	G
HG-203	1.1352E-02						
		279.17	1.135E-02	%(	4.381E-02	1.30E-02	G K
		72.87	-1.236E-02	& P	1.423E+00	4.26E-01	G
		70.83	7.798E-02	&	2.032E+00	6.06E-01	G
		82.50	-6.842E-01	%	2.365E+00	7.12E-01	G
TL-208	2.1742E-01						
		583.14	2.182E-01	(P	4.394E-02	2.03E-02	G
		510.72	2.146E-01	*(P	2.068E-01	6.43E-02	G
PB-212	5.7518E-01						
		238.63	5.752E-01	(P	9.134E-02	3.62E-02	G K
							Energy duplication
		77.11	7.201E-01	+	3.129E-01	1.02E-01	G
		74.81	8.115E-01	& P	6.274E-01	1.96E-01	G
PB-214	4.0417E-01						
		351.99	4.125E-01	(P	9.251E-02	3.76E-02	G K
		295.22	3.881E-01	(P	1.803E-01	6.19E-02	G
							Energy duplication
		77.11	1.164E+00	+ P	5.130E-01	1.66E-01	G
		241.92	1.023E-02	% P	7.247E-01	2.15E-01	G
BI-212	6.3918E-01						
		727.17	6.392E-01	(P	4.298E-01	1.74E-01	G K
		1620.56	3.037E-01	%	1.602E+00	4.42E-01	G
		785.42	-1.653E-02	% P	2.327E+00	6.48E-01	G
BI-214	4.0847E-01						
		609.32	4.085E-01	(P	9.949E-02	4.55E-02	G K
		1764.51	2.219E-01	- P	2.282E-01	8.24E-02	G
		1120.28	6.466E-01	+ P	3.812E-01	1.66E-01	G
RA-224	1.1218E+00						
		241.00	1.122E+00	(P	1.104E+00	3.45E-01	G
RA-226	1.0431E+00						
		185.99	1.043E+00	(	1.203E+00	3.72E-01	G
AC-228	6.2094E-01						
		911.07	6.209E-01	(P	1.586E-01	7.65E-02	G K
		968.90	8.981E-01	+ P	3.146E-01	1.44E-01	G
		338.40	9.017E-01	+ P	3.452E-01	1.49E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TH-227	2.0068E-01						
		236.00	2.007E-01	?(P	2.290E-01	7.19E-02	G K
		256.25	1.331E-01	& P	5.074E-01	1.51E-01	G
PA-234	7.6952E-02						
		98.44	7.695E-02	%(	1.690E-01	5.12E-02	G K
		946.00	0.000E+00	%	3.017E-01	8.49E-02	G
		131.28	1.088E-01	&	1.724E-01	5.27E-02	G
		94.67	5.547E-02	%	2.443E-01	7.31E-02	G
		883.24	4.920E-02	%	2.834E-01	7.96E-02	G
		926.70	-1.262E-02	%	3.983E-01	1.10E-01	G
		569.26	5.783E-02	%	3.968E-01	1.15E-01	G
TH-234	1.0062E+00						
		63.29	5.945E-01	%(P	1.999E+00	6.00E-01	G K
		92.80	1.541E+00	*(P	1.573E+00	4.86E-01	G
		92.38	-9.042E-02	% P	1.886E+00	5.58E-01	G
AM-241	-2.0013E-03						
		59.54	-2.001E-03	%(P	2.842E-01	8.43E-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	-1.4425E-02	-1.5289E-02	3.0448E-01	3.0448E-01	3.361E-01
K-40		1.2555E+01	1.2555E+01	1.6396E+00	1.7865E+00	
MN-54	#A	2.0004E-02	2.0204E-02	4.0057E-02	4.0073E-02	4.383E-02
CO-57	#B	-1.5226E-02	-1.5402E-02	3.9318E-02	3.9327E-02	4.298E-02
CO-60	#B	6.9632E-03	6.9744E-03	4.0153E-02	4.0155E-02	4.810E-02
Sr-85	#A	-9.7402E-03	-1.0218E-02	4.5949E-02	4.5953E-02	4.960E-02
Kr-85	#A	-2.5017E+02	-2.5018E+02	1.2392E+03	1.2393E+03	1.151E+03
Y-88	#B	0.0000E+00	0.0000E+00	9.0873E-03	9.0889E-03	2.168E-02
NB-94	#B	-2.0147E-04	-2.0147E-04	1.1731E-02	1.1731E-02	5.248E-02
Ag-108M	#B	1.1056E-02	1.1056E-02	4.1821E-02	4.1826E-02	4.787E-02
CD-109	#A	7.2173E-01	7.2669E-01	1.1683E+00	1.1690E+00	1.271E+00
SN-113	#B	1.1756E-02	1.2078E-02	5.1292E-02	5.1297E-02	5.653E-02
SB-125	#B	1.1254E-01	1.1289E-01	9.0815E-02	9.1039E-02	1.232E-01
I-131	#B	8.5765E-04	1.2621E-03	5.1164E-02	5.1164E-02	4.030E-02
CS-134	#B	2.6804E-02	2.6915E-02	2.2103E-02	2.2155E-02	4.476E-02
CS-137	#A	2.6757E-02	2.6764E-02	4.9237E-02	4.9260E-02	5.414E-02
CE-139	#A	-2.0373E-03	-2.0839E-03	5.0336E-02	5.0336E-02	4.798E-02
EU-152	#B	3.3510E-02	3.3532E-02	1.0885E-01	1.0887E-01	1.209E-01
EU-154	#B	1.2397E-04	1.2410E-04	8.7626E-02	8.7626E-02	9.839E-02
EU-155	#B	5.5151E-03	5.5245E-03	1.2506E-01	1.2506E-01	1.399E-01
HG-203	#B	1.0620E-02	1.1352E-02	3.9118E-02	3.9123E-02	4.099E-02
TL-208	#	2.1742E-01	2.1742E-01	6.0830E-02	6.2058E-02	4.394E-02
PB-212	#	5.7518E-01	5.7518E-01	1.0874E-01	1.1350E-01	9.134E-02
PB-214	#	4.0417E-01	4.0417E-01	1.1062E-01	1.1295E-01	9.251E-02
BI-212	#	6.3918E-01	6.3918E-01	5.2300E-01	5.2425E-01	
BI-214		4.0847E-01	4.0847E-01	1.3656E-01	1.3850E-01	
RA-224	#	1.1218E+00	1.1218E+00	1.0347E+00	1.0367E+00	1.104E+00
RA-226	#A	1.0431E+00	1.0431E+00	1.1159E+00	1.1175E+00	1.203E+00
AC-228		6.2094E-01	6.2094E-01	2.2945E-01	2.3212E-01	
TH-227	#A	2.0068E-01	2.0068E-01	2.1584E-01	2.1613E-01	2.290E-01
PA-234	#B	7.6952E-02	7.6952E-02	1.5362E-01	1.5368E-01	1.690E-01
TH-234	#B	1.0062E+00	1.0062E+00	9.5155E-01	9.5318E-01	1.999E+00
AM-241	#A	-2.0013E-03	-2.0013E-03	4.4932E-01	4.4932E-01	2.842E-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) 1.4223491E+01 pCi/gm
Total Decayed Activity (270.1 to 1999.1 keV) 1.4223491E+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_2AUG2006_1002.An1

Sample description
FSS-OOL-10-01-012-F

Spectrum Filename: C:\GammaVision\Spectra\101F_2AUG2006_1002.An1

Acquisition information
Start time: 02-Aug-2006 10:02:07
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: 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%
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	28-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. 18 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.5075

***** 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	160.	30.62	1.50	1.654E-02				
74.83	160.	30.62	1.50	1.654E-02	74.81	9.600	PBC<MDA	PB212
77.17	323.	15.27	1.50	1.720E-02	77.11	10.700	1.165E+00	PB214
					77.11	17.500	7.123E-01	PB212
77.17	326.	15.27	1.50	1.720E-02	77.11	10.700	1.165E+00	PB214
					77.11	17.500	7.205E-01	PB212
84.19	78.	36.70	0.78	1.873E-02				
86.79	121.	25.79	1.01	1.914E-02	86.45	32.740	1.293E-01	EU155
90.24	126.	24.64	1.02	1.960E-02	88.04	3.790	PBC<MDA	CD109
93.46	161.	18.81	1.02	1.996E-02	92.80	3.000	1.721E+00	TH234
185.88	134.	24.56	1.08	1.859E-02				
185.88	134.	24.56	1.08	1.859E-02	185.99	3.280	1.460E+00	RA226
209.56	118.	28.62	0.98	1.720E-02				
239.01	908.	3.82	1.12	1.556E-02	236.00	11.200	3.428E+00	TH227
					238.63	43.100	8.932E-01	PB212
241.92	110.	19.53	1.12	1.540E-02	241.00	3.900	1.202E+00	RA224
270.45	68.	28.29	1.15	1.399E-02				
295.66	190.	10.20	1.16	1.290E-02	295.22	19.200	5.053E-01	PB214
300.55	94.	17.52	1.17	1.270E-02				
329.06	86.	22.76	1.38	1.166E-02				
338.75	198.	15.26	1.05	1.134E-02	338.40	12.010	9.539E-01	AC228
352.26	273.	8.54	1.22	1.092E-02	351.99	37.100	4.445E-01	PB214
463.32	62.	28.97	1.55	8.345E-03				
463.32	62.	28.97	1.55	8.345E-03	463.51	10.000	4.850E-01	SB125
511.09	134.	14.32	1.20	7.585E-03	510.72	22.500	4.592E-01	TL208
583.56	245.	8.65	1.29	6.680E-03	583.14	86.000	2.805E-01	TL208
610.19	205.	12.31	1.12	6.404E-03	609.32	46.090	4.585E-01	BI214

727.87	71.	18.74	1.02	5.438E-03	727.17	11.800	7.268E-01	BI212
795.71	53.	25.51	1.78	5.016E-03				
795.71	53.	25.51	1.78	5.016E-03	795.76	85.400	8.260E-02	CS134
861.19	63.	19.63	1.79	4.674E-03				
911.89	152.	10.61	1.75	4.443E-03	911.07	29.000	7.739E-01	AC228
969.78	135.	14.90	1.60	4.209E-03	968.90	17.460	1.217E+00	AC228
1462.05	591.	4.24	1.82	2.940E-03	1460.75	10.700	1.244E+01	K40
1766.42	26.	22.80	2.11	2.481E-03	1764.51	15.920	4.310E-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	
173.16	86.76	430.	121.	0.061	77.37	1.013	BI-207	lD
180.05	90.21	421.	126.	0.063	73.92	1.016	PB-214	lD
418.79	209.56	390.	118.	0.059	85.85	0.979	AC-228	M
477.72	238.95	148.	908.	0.454	11.47	1.122	PB-212	D
483.54	241.86	174.	110.	0.055	58.58	1.124	PB-214	D
540.62	270.45	151.	68.	0.034	84.86	1.149	AC-228	s
601.00	300.63	183.	71.	0.036	97.14	0.688	PB-212	s
657.90	329.06	123.	86.	0.043	68.29	1.377	LA-140	s
1722.68	861.19	29.	63.	0.032	58.90	1.790	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	149.23	74.83	1199.	160.	0.080	91.87	1.499
PB-214	153.79	77.11	1083.	323.	0.161	45.82	1.499D
PB-212	153.79	77.11	1079.	326.	0.163	45.82	1.499D
TH-234	186.16	93.29	967.	171.	0.085	77.58	1.499s
RA-226	371.90	186.12	540.	128.	0.064	81.25	1.499s
PB-212	477.60	238.95	440.	676.	0.338	17.32	1.499
RA-224	482.50	241.40	11.	46.	0.023	52.53	1.499
PB-214	591.05	295.65	203.	173.	0.087	41.16	1.499
AC-228	677.29	338.75	218.	196.	0.098	45.78	1.045
PB-214	704.43	352.32	111.	254.	0.127	25.51	1.499s
SB-125	926.75	463.43	91.	47.	0.024	92.86	1.499s
TL-208	1022.11	511.09	94.	118.	0.059	42.95	1.198s
TL-208	1167.13	583.56	70.	243.	0.121	25.95	1.294s
BI-214	1220.42	610.19	109.	204.	0.102	36.93	1.116s
BI-212	1455.90	727.87	40.	70.	0.035	56.21	1.016s
CS-134	1591.05	795.41	40.	34.	0.017	92.84	1.502
AC-228	1824.12	911.89	38.	150.	0.075	31.82	1.751
AC-228	1939.97	969.78	70.	135.	0.067	44.69	1.598
K-40	2925.11	1462.05	10.	589.	0.295	12.71	1.818
BI-214	3534.27	1766.42	5.	26.	0.013	68.41	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		1.0504E-01					
			477.56	1.050E-01	%(	3.194E-01 9.48E-02	G
K-40		1.2438E+01					
			1460.75	1.244E+01	(P	3.665E-01 5.29E-01	G
MN-54		1.1787E-02					
			834.81	1.179E-02	&(P	4.557E-02 1.33E-02	G
CO-57		-8.3766E-03					
			122.07	-8.377E-03	%(	4.889E-02 1.46E-02	G K
			136.43	-2.070E-02	%	4.069E-01 1.21E-01	G
CO-60		-3.7768E-03					
			1332.51	-3.777E-03	&(P	4.964E-02 1.36E-02	G K
			1173.23	2.971E-02	% P	5.472E-02 1.68E-02	G K
Sr-85		-2.0849E-02					
			514.00	-2.085E-02	%(	5.430E-02 1.63E-02	G
Kr-85		-4.8006E+02					
			513.99	-4.801E+02	%(P	1.192E+03 3.57E+02	G
Y-88		-5.7799E-03					
			1836.01	-5.780E-03	%(	5.065E-02 1.36E-02	G K
			898.02	-2.885E-04	% P	5.534E-02 1.54E-02	G
NB-94		6.6688E-03					
			871.10	6.669E-03	%(P	3.673E-02 1.04E-02	G K
			702.50	6.034E-03	& P	3.526E-02 1.01E-02	G K
Ag-108M		3.2635E-04					
			722.95	3.263E-04	%(	4.828E-02 1.36E-02	G K
			614.37	-1.450E-02	% P	6.447E-02 1.91E-02	G
			433.93	1.371E-02	%	3.445E-02 1.03E-02	G
CD-109		2.4109E-01					
			88.04	2.411E-01	&(P	1.451E+00 4.35E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SN-113	-4.4448E-03						
		391.71	-4.445E-03	&(	6.746E-02	1.97E-02	G K
		255.04	-2.810E-02	& P	1.821E+00	5.34E-01	G
SB-125	1.0893E-01						
		427.95	1.759E-02	%(P	1.267E-01	3.70E-02	G K
		600.77	1.948E-03	% P	2.066E-01	5.81E-02	G
		636.15	1.597E-02	% P	3.408E-01	9.61E-02	G
		463.51	3.793E-01	(P	3.780E-01	1.21E-01	G
		176.29	1.131E-02	& P	6.028E-01	1.78E-01	G
I-131	-2.9295E-03						
		364.48	-2.929E-03	%(	6.953E-02	2.02E-02	G K
		636.97	1.002E-01	%	7.972E-01	2.28E-01	G
		284.29	-2.036E-01	&	9.880E-01	2.94E-01	G
CS-134	2.8305E-02						
		604.66	6.678E-03	&(P	4.293E-02	1.24E-02	G K
		795.76	5.302E-02	(P	5.015E-02	1.66E-02	G
		569.29	-5.111E-02	% P	2.907E-01	8.46E-02	G
		801.84	-8.792E-02	%	5.316E-01	1.53E-01	G
CS-137	-9.4489E-04						
		661.62	-9.449E-04	&(P	5.126E-02	1.44E-02	G
CE-139	-8.1584E-03						
		165.85	-8.158E-03	%(P	4.826E-02	1.44E-02	G
EU-152	-2.4736E-02						
		121.78	-2.474E-02	%(P	1.454E-01	4.35E-02	G K
		344.30	-2.414E-02	% P	1.483E-01	4.37E-02	G
		1408.08	5.085E-02	& P	2.327E-01	6.61E-02	G
		964.00	5.151E-02	& P	3.821E-01	1.09E-01	G
		1112.07	8.683E-02	& P	3.691E-01	1.07E-01	G
		778.90	-9.791E-04	% P	4.621E-01	1.32E-01	G
EU-154	1.2118E-02						
		123.10	1.212E-02	%(P	1.048E-01	3.13E-02	G K
		1274.80	-2.311E-02	& P	1.570E-01	4.45E-02	G
		723.30	7.277E-02	% P	1.381E-01	4.23E-02	G
		1004.80	-5.766E-04	& P	2.808E-01	7.75E-02	G
EU-155	1.5876E-02						
		86.45	1.588E-02	%(	1.817E-01	5.44E-02	G K
		105.31	5.050E-02	%	1.889E-01	5.68E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
HG-203	-1.6553E-02						
		279.17	-1.655E-02	%(	5.311E-02	1.59E-02	G K
		72.87	-6.120E-01	& P	1.251E+00	3.79E-01	G
		70.83	7.584E-01	%	1.630E+00	4.94E-01	G
		82.50	-9.874E-01	%	2.798E+00	8.45E-01	G
TL-208	2.8054E-01						
		583.14	2.805E-01	@(P	4.834E-02	2.45E-02	G
		510.72	4.592E-01	+ P	1.864E-01	7.47E-02	G
PB-212	6.8177E-01						
		238.63	6.689E-01	(P	9.945E-02	3.90E-02	G K
							Energy duplication
		77.11	7.205E-01	(	3.440E-01	1.10E-01	G
		74.81	6.688E-01	&(P	6.869E-01	2.12E-01	G
PB-214	4.3296E-01						
		351.99	4.166E-01	@(P	8.492E-02	3.57E-02	G K
		295.22	4.646E-01	(P	1.851E-01	6.44E-02	G
							Energy duplication
		77.11	1.165E+00	+ P	5.635E-01	1.80E-01	G
		241.92	-1.851E-01	% P	6.567E-01	1.97E-01	G
BI-212	7.2676E-01						
		727.17	7.268E-01	*(P	3.322E-01	1.38E-01	G K
		1620.56	2.390E-01	&	1.963E+00	5.42E-01	G
		785.42	5.446E-01	% P	2.085E+00	6.08E-01	G
BI-214	4.5147E-01						
		609.32	4.585E-01	@(P	1.156E-01	5.68E-02	G K
		1764.51	4.310E-01	?(P	2.219E-01	1.00E-01	G
		1120.28	7.002E-02	% P	3.292E-01	9.43E-02	G
RA-224	5.0771E-01						
		241.00	5.077E-01	(P	1.991E-01	9.03E-02	G
RA-226	1.3992E+00						
		185.99	1.399E+00	(	1.210E+00	3.79E-01	G
AC-228	8.2662E-01						
		911.07	7.739E-01	(P	1.618E-01	8.32E-02	G K
		968.90	1.217E+00	+ P	3.777E-01	1.82E-01	G
		338.40	9.539E-01	(P	3.490E-01	1.47E-01	G
TH-227	-1.3807E-01						
		236.00	-1.381E-01	%(P	4.128E-01	1.24E-01	G K
		256.25	-8.696E-02	% P	5.617E-01	1.66E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
PA-234	5.9070E-03						
		98.44	5.907E-03	%(	1.693E-01	5.04E-02	G K
		946.00	-3.905E-02	&	2.708E-01	7.78E-02	G
		131.28	1.337E-03	&	2.159E-01	6.42E-02	G
		94.67	-1.870E-01	%	3.395E-01	1.03E-01	G
		883.24	-6.606E-02	%	4.127E-01	1.19E-01	G
		926.70	1.270E-01	%	4.119E-01	1.21E-01	G
		569.26	-7.113E-02	%	4.282E-01	1.25E-01	G
TH-234	1.2465E+00						
		63.29	7.406E-01	%(P	2.090E+00	6.29E-01	G K
		92.80	1.904E+00	(P	1.644E+00	5.10E-01	G
		92.38	-2.247E-01	& P	1.955E+00	5.80E-01	G
AM-241	1.3683E-02						
		59.54	1.368E-02	&(P	2.645E-01	7.87E-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	9.8355E-02	1.0504E-01	2.8435E-01	2.8441E-01	2.991E-01
K-40		1.2438E+01	1.2438E+01	1.5871E+00	1.7357E+00	
MN-54	#A	1.1655E-02	1.1787E-02	3.9847E-02	3.9853E-02	4.506E-02
CO-57	#B	-8.2683E-03	-8.3766E-03	4.3916E-02	4.3918E-02	4.826E-02
CO-60	#B	-3.7699E-03	-3.7768E-03	4.4900E-02	4.4901E-02	4.955E-02
Sr-85	#A	-1.9750E-02	-2.0849E-02	4.8958E-02	4.8973E-02	5.144E-02
Kr-85	#A	-4.8004E+02	-4.8006E+02	1.1839E+03	1.1842E+03	1.192E+03
Y-88	#B	-5.5926E-03	-5.7799E-03	4.0866E-02	4.0867E-02	4.901E-02
NB-94	#B	6.6688E-03	6.6688E-03	3.1261E-02	3.1263E-02	3.673E-02
Ag-108M	#B	3.2632E-04	3.2635E-04	4.0691E-02	4.0691E-02	4.827E-02
CD-109	#A	2.3923E-01	2.4109E-01	1.3058E+00	1.3058E+00	1.440E+00
SN-113	#B	-4.3112E-03	-4.4448E-03	5.9110E-02	5.9110E-02	6.543E-02
SB-125	#B	1.0855E-01	1.0893E-01	1.0424E-01	1.0442E-01	1.263E-01
I-131	#B	-1.8926E-03	-2.9295E-03	6.0603E-02	6.0603E-02	4.492E-02
CS-134	#B	2.8173E-02	2.8305E-02	2.6600E-02	2.6649E-02	4.273E-02
CS-137	#A	-9.4459E-04	-9.4489E-04	4.0501E-01	4.0501E-01	5.124E-02
CE-139	#A	-7.9526E-03	-8.1584E-03	4.4750E-02	4.4752E-02	4.705E-02
EU-152	#B	-2.4717E-02	-2.4736E-02	1.3976E-01	1.3977E-01	1.453E-01
EU-154	#B	1.2104E-02	1.2118E-02	9.3883E-02	9.3886E-02	1.046E-01
EU-155	#B	1.5845E-02	1.5876E-02	1.6329E-01	1.6329E-01	1.814E-01
HG-203	#B	-1.5351E-02	-1.6553E-02	4.7779E-02	4.7788E-02	4.926E-02
TL-208	#	2.8054E-01	2.8054E-01	7.3504E-02	7.5194E-02	
PB-212	#	6.8177E-01	6.8177E-01	1.1915E-01	1.2523E-01	9.945E-02
PB-214	#	4.3296E-01	4.3296E-01	1.0583E-01	1.0862E-01	8.492E-02
BI-212	#	7.2676E-01	7.2676E-01	4.1245E-01	4.1449E-01	
BI-214	#	4.5147E-01	4.5147E-01	1.6765E-01	1.6958E-01	
RA-224		5.0771E-01	5.0771E-01	2.7083E-01	2.7234E-01	1.991E-01
RA-226	#	1.3992E+00	1.3992E+00	1.1369E+00	1.1396E+00	1.210E+00
AC-228		8.2662E-01	8.2662E-01	2.3313E-01	2.3776E-01	
TH-227	#B	-1.3807E-01	-1.3807E-01	3.8159E-01	3.8167E-01	4.128E-01
PA-234	#B	5.9070E-03	5.9070E-03	1.5121E-01	1.5121E-01	1.693E-01
TH-234	#B	1.2465E+00	1.2465E+00	1.0019E+00	1.0043E+00	2.090E+00
AM-241	#A	1.3682E-02	1.3683E-02	2.3603E-01	2.3604E-01	2.645E-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 (270.1 to 1999.1 keV) 1.5230804E+01 pCi/gm
Total Decayed Activity (270.1 to 1999.1 keV) 1.5230804E+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_2AUG2006_1043.An1

Sample description
FSS-OOL-10-01-004-F

Spectrum Filename: C:\GammaVision\Spectra\101F_2AUG2006_1043.An1

Acquisition information

Start time:	02-Aug-2006 10:43:23
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:	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	28-Jul-2006 07:34:00
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. 17 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.5290

***** 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	263.	12.18	1.00	1.654E-02	74.81	9.600	1.105E+00	PB212
77.20	299.	9.38	1.01	1.720E-02	77.11	17.500	8.028E-01	PB212
					77.11	10.700	1.299E+00	PB214
84.18	81.	36.44	1.01	1.874E-02				
87.27	179.	16.34	1.01	1.922E-02	86.45	32.740	1.906E-01	EU155
					88.04	3.790	1.633E+00	CD109
90.07	93.	29.47	1.02	1.959E-02				
93.20	146.	21.29	1.02	1.994E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
128.96	102.	33.82	1.41	2.110E-02				
186.42	92.	36.80	1.09	1.856E-02	185.99	3.280	1.001E+00	RA226
209.23	82.	30.56	1.03	1.722E-02				
239.01	906.	3.86	1.12	1.556E-02	238.63	43.100	8.925E-01	PB212
241.88	149.	19.15	1.12	1.541E-02	241.00	3.900	1.634E+00	RA224
					241.92	7.470	8.560E-01	PB214
270.00	104.	25.37	0.90	1.401E-02				
277.33	59.	39.98	1.18	1.368E-02				
295.54	176.	12.72	0.94	1.291E-02	295.22	19.200	4.683E-01	PB214
300.55	69.	29.61	1.52	1.271E-02				
328.33	61.	29.94	1.26	1.168E-02				
338.71	202.	12.68	1.00	1.134E-02	338.40	12.010	9.763E-01	AC228
352.37	299.	9.30	1.23	1.091E-02	351.99	37.100	4.881E-01	PB214
463.33	60.	21.37	1.00	8.345E-03				
463.33	60.	21.37	1.00	8.345E-03	463.51	10.000	4.724E-01	SB125
511.30	136.	16.32	1.55	7.582E-03	510.72	22.500	4.694E-01	TL208
583.78	242.	8.39	1.37	6.677E-03	583.14	86.000	2.770E-01	TL208
610.00	194.	9.01	1.23	6.406E-03	609.32	46.090	4.338E-01	BI214

728.16	84.	21.89	1.56	5.436E-03	727.17	11.800	8.620E-01	BI212
912.25	177.	10.97	1.79	4.441E-03	911.07	29.000	9.046E-01	AC228
969.54	126.	13.02	1.37	4.210E-03	968.90	17.460	1.137E+00	AC228
1121.34	41.	30.52	1.05	3.711E-03	1120.28	15.040	4.943E-01	BI214
1462.01	496.	4.58	1.77	2.940E-03	1460.75	10.700	1.045E+01	K40
1622.42	15.	34.03	1.10	2.682E-03	1620.56	2.750	1.364E+00	BI212
1766.23	52.	14.65	3.64	2.481E-03	1764.51	15.920	8.828E-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
167.93	84.21	390.	81.	0.040	109.33	1.012	TA-182 lD
179.71	90.10	330.	93.	0.047	88.42	1.016	PB-214 lD
418.13	209.23	273.	82.	0.041	91.68	1.033	AC-228
539.73	270.00	229.	104.	0.052	76.12	0.901	AC-228 s
600.85	300.55	144.	69.	0.034	88.82	1.519	PB-212 s
656.44	328.33	125.	61.	0.031	89.82	1.261	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	149.19	74.81	407.	263.	0.132	36.54	1.005D
PB-212	153.79	77.11	484.	299.	0.150	28.14	1.007A
EU-155	173.89	87.16	999.	152.	0.076	91.25	1.499
TH-234	186.14	93.28	894.	149.	0.075	84.70	1.499s
RA-226	372.59	186.47	541.	98.	0.049	104.79	1.499
PB-212	476.96	238.63	187.	901.	0.450	11.78	1.122D
PB-214	483.54	241.92	249.	83.	0.042	71.03	1.124A
PB-214	590.83	295.54	138.	174.	0.087	38.15	0.944s
AC-228	677.20	338.71	164.	200.	0.100	38.03	1.000s
PB-214	704.54	352.37	160.	297.	0.149	27.90	1.226
SB-125	926.79	463.45	72.	58.	0.029	71.20	1.499s
TL-208	1022.54	511.30	122.	120.	0.060	48.96	1.552s
TL-208	1167.58	583.78	70.	239.	0.120	25.16	1.373
BI-214	1220.04	610.00	52.	192.	0.096	27.04	1.233
BI-212	1456.47	728.16	71.	83.	0.042	65.67	1.563
AC-228	1824.84	912.25	56.	175.	0.088	32.90	1.794s
AC-228	1939.50	969.54	44.	126.	0.063	39.07	1.366
BI-214	2243.26	1121.34	44.	41.	0.021	91.56	1.052s
K-40	2925.04	1462.01	8.	494.	0.247	13.75	1.768
BI-212	3246.07	1622.42	3.	15.	0.008	102.10	1.096s
BI-214	3533.90	1766.23	3.	52.	0.026	43.95	3.643s

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		-5.7273E-02					
			477.56	-5.727E-02	%(	4.191E-01 1.22E-01	G
K-40		1.0453E+01					
			1460.75	1.045E+01	(P	3.340E-01 4.82E-01	G
MN-54		-9.7669E-03					
			834.81	-9.767E-03	&(P	5.095E-02 1.47E-02	G
CO-57		1.5279E-02					
			122.07	1.528E-02	%(	4.583E-02 1.38E-02	G K
			136.43	8.257E-02	%	3.090E-01 9.26E-02	G
CO-60		1.9039E-02					
			1332.51	1.904E-02	%(P	5.302E-02 1.57E-02	G K
			1173.23	-1.378E-02	% P	5.804E-02 1.68E-02	G K
Sr-85		-1.6709E-02					
			514.00	-1.671E-02	%(	5.349E-02 1.60E-02	G
Kr-85		-3.8949E+02					
			513.99	-3.895E+02	%(P	1.174E+03 3.49E+02	G
Y-88		-1.5647E-03					
			1836.01	-1.565E-03	%(	4.323E-02 1.09E-02	G K
			898.02	-3.986E-03	& P	5.445E-02 1.54E-02	G
NB-94		1.3943E-03					
			871.10	1.394E-03	&(P	6.014E-02 1.71E-02	G K
			702.50	-2.713E-03	% P	4.816E-02 1.37E-02	G K
Ag-108M		-9.9646E-03					
			722.95	-9.965E-03	&(	5.092E-02 1.48E-02	G K
			614.37	-4.075E-02	% P	6.668E-02 2.05E-02	G
			433.93	7.995E-04	&	3.885E-02 1.11E-02	G
CD-109		2.0452E-02					
			88.04	2.045E-02	%(P	1.360E+00 4.05E-01	G
SN-113		-1.7155E-02					
			391.71	-1.716E-02	&(	7.051E-02 2.10E-02	G K
			255.04	-1.480E-01	% P	1.721E+00 5.07E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	9.9252E-02						
		427.95	-2.450E-02	%(P	1.390E-01	4.08E-02	G K
		600.77	-8.222E-02	% P	2.793E-01	8.28E-02	G
		636.15	-8.252E-02	% P	4.040E-01	1.18E-01	G
		463.51	4.656E-01	*(P	3.375E-01	1.13E-01	G
		176.29	8.984E-02	% P	6.090E-01	1.81E-01	G
I-131	6.8990E-03						
		364.48	6.899E-03	%(	6.674E-02	1.95E-02	G K
		636.97	-2.468E-02	%	1.017E+00	2.91E-01	G
		284.29	1.397E-01	%	9.678E-01	2.86E-01	G
CS-134	1.0253E-02						
		604.66	1.025E-02	&(P	4.330E-02	1.27E-02	G K
		795.76	3.232E-02	% P	5.704E-02	1.75E-02	G
		569.29	-2.865E-02	& P	2.373E-01	6.78E-02	G
		801.84	0.000E+00	%	6.417E-01	1.82E-01	G
CS-137	8.1850E-03						
		661.62	8.185E-03	%(P	5.469E-02	1.58E-02	G
CE-139	1.2470E-02						
		165.85	1.247E-02	%(P	4.900E-02	1.47E-02	G
EU-152	4.4140E-02						
		121.78	4.414E-02	%(P	1.365E-01	4.11E-02	G K
		344.30	-3.582E-02	% P	1.480E-01	4.39E-02	G
		1408.08	3.859E-02	% P	2.054E-01	5.73E-02	G
		964.00	-5.285E-03	& P	3.720E-01	1.04E-01	G
		1112.07	6.542E-04	& P	4.505E-01	1.26E-01	G
		778.90	4.209E-02	% P	3.318E-01	9.47E-02	G
EU-154	-4.0293E-03						
		123.10	-4.029E-03	&(P	1.036E-01	3.08E-02	G K
		1274.80	1.164E-03	& P	1.553E-01	4.25E-02	G
		723.30	-4.340E-02	% P	2.284E-01	6.60E-02	G
		1004.80	6.377E-02	% P	2.934E-01	8.49E-02	G
EU-155	1.6270E-01						
		86.45	1.627E-01	(	1.601E-01	4.95E-02	G K
		105.31	3.709E-02	%	1.902E-01	5.70E-02	G
HG-203	-8.7033E-03						
		279.17	-8.703E-03	&(	5.223E-02	1.55E-02	G K
		72.87	-6.769E-01	& P	1.286E+00	3.90E-01	G
		70.83	-2.595E-01	%	1.965E+00	5.88E-01	G
		82.50	-8.603E-01	%	2.745E+00	8.28E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	2.7704E-01						
		583.14	2.770E-01	(P	4.827E-02	2.35E-02	G
		510.72	4.694E-01	+ P	2.110E-01	8.69E-02	G
PB-212	8.6759E-01						
		238.63	8.939E-01	(P	6.595E-02	3.53E-02	G K
							Energy duplication
		77.11	6.617E-01	}	2.328E-01	6.21E-02	G
		74.81	1.105E+00	+ P	4.055E-01	1.37E-01	G
PB-214	4.8096E-01						
		351.99	4.881E-01	(P	1.013E-01	4.57E-02	G K
		295.22	4.683E-01	@(P	1.540E-01	6.02E-02	G
							Energy duplication
		77.11	0.000E+00	} P	5.220E-01	0.00E+00	G
		241.92	4.810E-01	} P	4.417E-01	1.14E-01	G
BI-212	9.5679E-01						
		727.17	8.620E-01	(P	4.349E-01	1.90E-01	G K
		1620.56	1.364E+00	(	9.614E-01	4.65E-01	G
		785.42	3.643E-01	% P	2.198E+00	6.32E-01	G
BI-214	4.4865E-01						
		609.32	4.338E-01	(P	8.147E-02	3.94E-02	G K
		1764.51	8.828E-01	+ P	1.733E-01	1.31E-01	G
		1120.28	4.943E-01	(P	3.995E-01	1.52E-01	G
RA-224	8.0728E-01						
							Derived Ave Activity
		241.00	8.073E-01	}(P	1.434E+00	4.38E-01	G
RA-226	1.0744E+00						
		185.99	1.074E+00	(	1.214E+00	3.75E-01	G
AC-228	9.8879E-01						
		911.07	9.046E-01	@(P	1.939E-01	1.00E-01	G K
		968.90	1.137E+00	(P	3.058E-01	1.49E-01	G
		338.40	9.763E-01	@(P	3.050E-01	1.25E-01	G
TH-227	-1.7798E-02						
		236.00	-1.780E-02	&(P	4.685E-01	1.39E-01	G K
		256.25	-1.172E-01	% P	5.188E-01	1.54E-01	G
PA-234	3.4468E-02						
		98.44	3.447E-02	%(	1.495E-01	4.48E-02	G K
		946.00	5.451E-02	%	1.996E-01	5.80E-02	G
		131.28	-3.718E-02	&	2.183E-01	6.54E-02	G
		94.67	4.537E-04	&	2.854E-01	8.49E-02	G
		883.24	2.567E-05	&	3.860E-01	1.07E-01	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          926.70-5.435E-02 &   3.858E-01 1.09E-01 G
                          569.26-3.318E-02 &   3.479E-01 9.95E-02 G

TH-234       1.0524E+00
                           63.29 5.788E-01 %(P 2.168E+00 6.51E-01 G K
                           92.80 1.668E+00 *(P 1.585E+00 4.90E-01 G
                           92.38-1.556E-01 % P 1.861E+00 5.51E-01 G

AM-241      -2.4867E-02
                           59.54-2.487E-02 %(P 2.476E-01 7.37E-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	-5.3582E-02	-5.7273E-02	3.6656E-01	3.6657E-01	3.921E-01
K-40		1.0453E+01	1.0453E+01	1.4439E+00	1.5600E+00	
MN-54	#A	-9.6563E-03	-9.7669E-03	4.9713E-02	4.9716E-02	5.037E-02
CO-57	#B	1.5079E-02	1.5279E-02	4.1429E-02	4.1437E-02	4.523E-02

CO-60	#B	1.9004E-02	1.9039E-02	4.7044E-02	4.7056E-02	5.292E-02
Sr-85	#A	-1.5817E-02	-1.6709E-02	4.7883E-02	4.7893E-02	5.064E-02
Kr-85	#A	-3.8948E+02	-3.8949E+02	1.1848E+03	1.1850E+03	1.174E+03
Y-88	#B	-1.5133E-03	-1.5647E-03	3.2838E-02	3.2839E-02	4.181E-02
NB-94	#B	1.3943E-03	1.3943E-03	5.1354E-02	5.1354E-02	6.014E-02
Ag-108M	#B	-9.9639E-03	-9.9646E-03	4.4416E-02	4.4420E-02	5.091E-02
CD-109	#A	2.0292E-02	2.0452E-02	1.2165E+00	1.2165E+00	1.350E+00
SN-113	#B	-1.6633E-02	-1.7155E-02	6.2861E-02	6.2869E-02	6.836E-02
SB-125	#B	9.8904E-02	9.9252E-02	7.2426E-02	7.2643E-02	1.385E-01
I-131	#B	4.4325E-03	6.8990E-03	5.8426E-02	5.8427E-02	4.288E-02
CS-134	#B	1.0205E-02	1.0253E-02	3.8024E-02	3.8028E-02	4.309E-02
CS-137	#A	8.1823E-03	8.1850E-03	4.7411E-02	4.7413E-02	5.467E-02
CE-139	#A	1.2152E-02	1.2470E-02	4.4092E-02	4.4098E-02	4.775E-02
EU-152	#B	4.4106E-02	4.4140E-02	1.2329E-01	1.2332E-01	1.364E-01
EU-154	#B	-4.0246E-03	-4.0293E-03	1.3207E-01	1.3207E-01	1.034E-01
EU-155	#	1.6238E-01	1.6270E-01	1.4847E-01	1.4874E-01	1.598E-01
HG-203	#B	-8.0636E-03	-8.7033E-03	4.6503E-02	4.6505E-02	4.839E-02
TL-208		2.7704E-01	2.7704E-01	7.0399E-02	7.2118E-02	
PB-212		8.6759E-01	8.6759E-01	1.0292E-01	1.1400E-01	
PB-214		4.8096E-01	4.8096E-01	1.3506E-01	1.3777E-01	
BI-212		9.5679E-01	9.5679E-01	5.8215E-01	5.8465E-01	
BI-214		4.4865E-01	4.4865E-01	1.2201E-01	1.2461E-01	
RA-224	A	8.0728E-01	8.0728E-01	1.3124E+00	1.3132E+00	
RA-226	#A	1.0744E+00	1.0744E+00	1.1258E+00	1.1275E+00	1.214E+00
AC-228		9.8879E-01	9.8879E-01	2.1174E-01	2.1899E-01	
TH-227	#B	-1.7798E-02	-1.7798E-02	5.0315E-01	5.0316E-01	4.685E-01
PA-234	#B	3.4468E-02	3.4468E-02	1.3440E-01	1.3442E-01	1.495E-01
TH-234	#B	1.0524E+00	1.0524E+00	9.2828E-01	9.3011E-01	2.168E+00
AM-241	#A	-2.4866E-02	-2.4867E-02	2.5766E-01	2.5767E-01	2.476E-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) 1.5279682E+01 pCi/gm
Total Decayed Activity (269.6 to 1999.1 keV) 1.5279682E+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_JULY2006_1429.An1

Sample description
OOL-10-01-001-C

Spectrum Filename: C:\GammaVision\Spectra\102_JULY2006_1429.An1

Acquisition information
Start time: 05-Jul-2006 14:29:35
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: 2.1490E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 2.1490E+03) =
4.6533E+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	30-Jun-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. 14 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.5905

***** 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
75.13	104.	40.37	1.50	8.847E-03	74.81	9.600	PBC<MDA	PB212
77.21	173.	25.04	1.50	9.541E-03	77.11	10.700	1.064E+00	PB214
					77.11	17.500	6.508E-01	PB212
					82.50	2.240	4.740E+00	HG203
77.21	173.	25.04	1.50	9.541E-03	77.11	10.700	1.064E+00	PB214
					77.11	17.500	6.508E-01	PB212
					82.50	2.240	4.740E+00	HG203
186.39	115.	30.92	1.35	1.625E-02	185.99	3.280	1.299E+00	RA226
209.45	69.	34.67	1.23	1.518E-02				
238.97	595.	5.12	1.21	1.379E-02	238.63	43.100	6.292E-01	PB212
241.73	84.	28.25	1.22	1.366E-02	241.00	3.900	PBC<MDA	RA224
					241.92	7.470	5.191E-01	PB214
295.46	122.	19.47	1.24	1.146E-02	295.22	19.200	3.479E-01	PB214
339.30	147.	17.21	1.36	1.003E-02	338.40	12.010	7.651E-01	AC228
352.42	210.	9.69	1.27	9.667E-03	351.99	37.100	3.664E-01	PB214
463.25	39.	34.97	1.50	7.365E-03	463.51	10.000	PBC<MDA	SB125
510.93	87.	20.01	1.41	6.692E-03	510.72	22.500	3.632E-01	TL208
583.84	196.	12.16	1.36	5.883E-03	583.14	86.000	2.428E-01	TL208
610.04	173.	9.98	1.47	5.643E-03	609.32	46.090	4.178E-01	BI214
728.51	64.	19.37	1.34	4.786E-03	727.17	11.800	7.070E-01	BI212
912.42	125.	13.65	1.74	3.917E-03	911.07	29.000	6.882E-01	AC228
965.61	28.	26.61	1.72	3.729E-03				
970.48	67.	15.22	1.72	3.713E-03	968.90	17.460	6.462E-01	AC228
1122.11	59.	25.59	0.92	3.279E-03				
1462.60	452.	4.75	1.96	2.618E-03	1460.75	10.700	1.014E+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	
418.51	209.45	232.	69.	0.035	104.01	1.230	AC-228	
477.56	238.93	167.	595.	0.298	15.36	1.215	PB-212	D
483.09	241.70	241.	84.	0.042	84.76	1.217	PB-214	D
1931.46	965.63	13.	28.	0.014	79.95	1.716	TB-160	D
2244.61	1122.11	45.	59.	0.030	61.82	0.919	TA-182	s
3534.85	1766.69	2.	30.	0.015	58.01	1.365	XE-138	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	149.84	75.13	884.	104.	0.052	121.11	1.500s
PB-214	153.80	77.11	849.	173.	0.086	75.11	1.500D
PB-212	153.80	77.11	849.	173.	0.086	75.11	1.500D
RA-226	372.19	186.29	467.	88.	0.044	103.86	1.500s
PB-212	477.46	238.91	410.	537.	0.269	20.56	1.500s
PB-214	590.92	295.63	166.	110.	0.055	57.31	1.500
AC-228	678.27	339.30	154.	147.	0.073	51.62	1.355s
PB-214	704.52	352.42	109.	216.	0.108	28.81	1.500
SB-125	926.26	463.25	81.	39.	0.019	104.92	1.500s
TL-208	1021.63	510.93	72.	87.	0.043	60.02	1.414s
TL-208	1167.51	583.84	102.	198.	0.099	37.30	1.359
BI-214	1219.93	610.04	48.	173.	0.086	29.93	1.469
BI-212	1456.98	728.51	30.	64.	0.032	58.11	1.339s
AC-228	1824.98	912.42	41.	124.	0.062	40.96	1.739
AC-228	1938.01	968.90	39.	61.	0.031	57.98	1.718D
K-40	2926.17	1462.63	0.	439.	0.219	14.30	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		2.8443E-02					
			477.56	2.844E-02	&(	3.573E-01 1.02E-01	G
K-40		9.8379E+00					
			1460.75	9.838E+00	?(P	1.653E-01 4.69E-01	G
MN-54		5.8188E-03					
			834.81	5.819E-03	&(P	4.191E-02 1.18E-02	G
CO-57		-7.8324E-04					
			122.07	-7.832E-04	%(	4.939E-02 1.46E-02	G K
			136.43	1.090E-01	&	4.076E-01 1.22E-01	G
CO-60		2.1212E-02					
			1332.51	2.121E-02	%(P	4.941E-02 1.48E-02	G K
			1173.23	9.533E-04	%	6.480E-02 1.81E-02	G K
Sr-85		-1.7173E-02					
			514.00	-1.717E-02	%(	5.428E-02 1.62E-02	G
Kr-85		-3.7582E+02					
			513.99	-3.758E+02	%(	1.188E+03 3.54E+02	G
Y-88		-6.3644E-03					
			1836.01	-6.364E-03	%(P	5.513E-02 1.49E-02	G K
			898.02	9.161E-03	& P	5.096E-02 1.45E-02	G
NB-94		5.8907E-03					
			871.10	5.891E-03	&(	4.501E-02 1.28E-02	G K
			702.50	4.794E-03	%	3.996E-02 1.14E-02	G K
Ag-108M		1.1286E-02					
			722.95	1.129E-02	&(	3.298E-02 9.70E-03	G K
			614.37	-2.770E-02	% P	5.909E-02 1.79E-02	G
			433.93	2.405E-04	&	3.843E-02 1.09E-02	G
CD-109		-5.2513E-01					
			88.04	-5.251E-01	%(P	1.792E+00 5.38E-01	G
SN-113		-2.3917E-03					
			391.71	-2.392E-03	%(	5.622E-02 1.62E-02	G K
			255.04	-1.181E-01	%	1.768E+00 5.20E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	9.6268E-02						
		427.95	1.636E-02	&(P	1.160E-01	3.35E-02	G K
		600.77	9.095E-02	% P	1.613E-01	4.98E-02	G
		636.15	-5.009E-02	% P	3.983E-01	1.15E-01	G
		463.51	3.328E-01	*(P	3.828E-01	1.21E-01	G
		176.29	-3.420E-02	& P	5.888E-01	1.74E-01	G
I-131	-6.5639E-03						
		364.48	-6.564E-03	%(	7.222E-02	2.11E-02	G K
		636.97	-7.963E-03	%	8.271E-01	2.31E-01	G
		284.29	2.160E-01	%	8.676E-01	2.58E-01	G
CS-134	5.5208E-04						
		604.66	5.521E-04	&(	4.217E-02	1.19E-02	G K
		795.76	1.217E-02	%	5.308E-02	1.54E-02	G
		569.29	4.467E-02	&	2.461E-01	7.13E-02	G
		801.84	-2.050E-02	% P	4.228E-01	1.16E-01	G
CS-137	1.4647E-02						
		661.62	1.465E-02	%(	5.283E-02	1.55E-02	G
CE-139	5.0963E-03						
		165.85	5.096E-03	%(P	4.959E-02	1.47E-02	G
EU-152	-7.1863E-03						
		121.78	-7.186E-03	%(P	1.442E-01	4.28E-02	G K
		344.30	-4.839E-02	%	1.541E-01	4.61E-02	G
		1408.08	8.379E-03	&	2.705E-01	7.37E-02	G
		964.00	-2.619E-02	& P	3.466E-01	9.68E-02	G
		1112.07	1.353E-01	%	4.175E-01	1.23E-01	G
		778.90	1.536E-02	% P	2.981E-01	8.26E-02	G
EU-154	3.1940E-03						
		123.10	3.194E-03	%(P	1.076E-01	3.19E-02	G K
		1274.80	-2.810E-02	%	1.737E-01	4.95E-02	G
		723.30	2.801E-02	& P	1.743E-01	4.93E-02	G
		1004.80	6.398E-02	%	2.508E-01	7.25E-02	G
EU-155	-3.7406E-03						
		86.45	-3.741E-03	%(P	2.114E-01	6.27E-02	G K
		105.31	1.306E-01	%	2.314E-01	7.05E-02	G
HG-203	4.8922E-03						
		279.17	4.892E-03	%(P	4.061E-02	1.19E-02	G K
		72.87	-8.155E-01	%	1.866E+00	5.65E-01	G
		70.83	-1.923E+00	&	3.286E+00	1.00E+00	G
		82.50	-1.810E-03	%	2.699E+00	7.97E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	2.4530E-01						
		583.14	2.453E-01	(P	6.191E-02	3.06E-02	G
		510.72	3.632E-01	+	1.764E-01	7.27E-02	G
PB-212	5.9193E-01						
		238.63	5.680E-01	@(	1.026E-01	3.89E-02	G K
							Energy duplication
		77.11	6.508E-01	*(	5.217E-01	1.63E-01	G
		74.81	7.703E-01	& P	1.046E+00	3.20E-01	G
PB-214	3.5684E-01						
		351.99	3.789E-01	(P	8.981E-02	3.65E-02	G K
		295.22	3.142E-01	(	1.792E-01	6.00E-02	G
							Energy duplication
		77.11	1.064E+00	+	8.533E-01	2.66E-01	G
		241.92	1.409E-01	%	6.758E-01	2.02E-01	G
BI-212	7.0697E-01						
		727.17	7.070E-01	*(	3.157E-01	1.37E-01	G K
		1620.56	-2.206E-01	% P	1.565E+00	4.11E-01	G
		785.42	-4.360E-01	& P	2.384E+00	6.88E-01	G
BI-214	4.1781E-01						
		609.32	4.178E-01	(	8.452E-02	4.17E-02	G K
		1764.51	-9.478E-03	% P	3.600E-01	9.51E-02	G
		1120.28	0.000E+00	%	4.644E-01	1.30E-01	G
RA-224	6.5327E-01						
		241.00	6.533E-01	%(P	1.207E+00	3.67E-01	G
RA-226	1.0329E+00						
		185.99	1.033E+00	@(P	1.218E+00	3.76E-01	G
AC-228	6.7511E-01						
		911.07	6.882E-01	(P	1.790E-01	9.43E-02	G K
		968.90	5.915E-01	(P	3.089E-01	1.14E-01	G
		338.40	7.651E-01	*(	3.151E-01	1.32E-01	G
TH-227	-2.4075E-01						
		236.00	-2.407E-01	&(P	4.577E-01	1.39E-01	G K
		256.25	1.329E-01	&	4.881E-01	1.46E-01	G
PA-234	-4.8708E-03						
		98.44	-4.871E-03	&(	2.315E-01	6.89E-02	G K
		946.00	-3.506E-02	%	2.741E-01	7.83E-02	G
		131.28	0.000E+00	%	2.173E-01	6.44E-02	G
		94.67	-1.629E-01	%	3.828E-01	1.16E-01	G
		883.24	8.826E-02	&	3.569E-01	1.03E-01	G
		926.70	-4.053E-02	%	3.608E-01	1.00E-01	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26 6.789E-02 &   3.608E-01 1.05E-01 G

TH-234       3.1779E-01
                           63.29 3.178E-01 %(P 4.362E+00 1.30E+00 G K
                           92.80 1.561E+00 %   2.168E+00 6.64E-01 G
                           92.38 1.773E+00 % P 2.609E+00 7.97E-01 G

AM-241       1.2397E-01
                           59.54 1.240E-01 %(  5.900E-01 1.77E-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	2.6656E-02	2.8443E-02	3.0663E-01	3.0664E-01	3.348E-01
K-40	#	9.8379E+00	9.8379E+00	1.4075E+00	1.5119E+00	1.653E-01
MN-54	#A	5.7546E-03	5.8188E-03	3.5512E-02	3.5513E-02	4.145E-02
CO-57	#B	-7.7325E-04	-7.8324E-04	4.3912E-02	4.3912E-02	4.876E-02
CO-60	#B	2.1174E-02	2.1212E-02	4.4513E-02	4.4529E-02	4.932E-02

Sr-85	#A	-1.6279E-02	-1.7173E-02	4.8566E-02	4.8576E-02	5.146E-02
Kr-85	#A	-3.7581E+02	-3.7582E+02	1.0629E+03	1.0631E+03	1.188E+03
Y-88	#B	-6.1609E-03	-6.3644E-03	4.4940E-02	4.4942E-02	5.336E-02
NB-94	#B	5.8907E-03	5.8907E-03	3.8261E-02	3.8262E-02	4.501E-02
Ag-108M	#B	1.1285E-02	1.1286E-02	2.9100E-02	2.9107E-02	3.297E-02
CD-109	#A	-5.2113E-01	-5.2513E-01	1.7439E+00	1.7442E+00	1.778E+00
SN-113	#B	-2.3207E-03	-2.3917E-03	4.8582E-02	4.8583E-02	5.455E-02
SB-125	#B	9.5939E-02	9.6268E-02	1.0503E-01	1.0517E-01	1.156E-01
I-131	#B	-4.2654E-03	-6.5639E-03	6.3206E-02	6.3207E-02	4.693E-02
CS-134	#B	5.4954E-04	5.5208E-04	3.5663E-02	3.5663E-02	4.197E-02
CS-137	#A	1.4642E-02	1.4647E-02	4.6641E-02	4.6648E-02	5.281E-02
CE-139	#A	4.9694E-03	5.0963E-03	4.4220E-02	4.4221E-02	4.836E-02
EU-152	#B	-7.1809E-03	-7.1863E-03	1.7580E-01	1.7580E-01	1.441E-01
EU-154	#B	3.1904E-03	3.1940E-03	9.5842E-02	9.5843E-02	1.075E-01
EU-155	#B	-3.7335E-03	-3.7406E-03	7.7811E-01	7.7811E-01	2.110E-01
HG-203	#B	4.5415E-03	4.8922E-03	3.5699E-02	3.5700E-02	3.770E-02
TL-208		2.4530E-01	2.4530E-01	9.1681E-02	9.2708E-02	
PB-212	#	5.9193E-01	5.9193E-01	1.2171E-01	1.2616E-01	1.026E-01
PB-214	#	3.5684E-01	3.5684E-01	1.0299E-01	1.0492E-01	8.981E-02
BI-212	#	7.0697E-01	7.0697E-01	4.1082E-01	4.1273E-01	
BI-214		4.1781E-01	4.1781E-01	1.2503E-01	1.2721E-01	
RA-224	#A	6.5327E-01	6.5327E-01	1.1011E+00	1.1017E+00	1.207E+00
RA-226	#A	1.0329E+00	1.0329E+00	1.1274E+00	1.1289E+00	1.218E+00
AC-228		6.7511E-01	6.7511E-01	1.9765E-01	2.0125E-01	
TH-227	#B	-2.4075E-01	-2.4075E-01	4.2125E-01	4.2147E-01	4.577E-01
PA-234	#B	-4.8708E-03	-4.8708E-03	2.0662E-01	2.0662E-01	2.315E-01
TH-234	#B	3.1779E-01	3.1779E-01	3.9008E+00	3.9009E+00	4.362E+00
AM-241	#A	1.2397E-01	1.2397E-01	5.3008E-01	5.3012E-01	5.899E-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 (1121.8 to 1999.0 keV) 2.0451887E+00 pCi/gm
Total Decayed Activity (1121.8 to 1999.0 keV) 2.0451887E+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_1AUG2006_1605.An1

Sample description
FSS-OOL-10-01-014-F

Spectrum Filename: C:\GammaVision\Spectra\102F_1AUG2006_1605.An1

Acquisition information
Start time: 01-Aug-2006 16:05:32
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: 2.0120E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 2.0120E+03) =
4.9702E+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	28-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. 12 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.5808

***** 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
77.19	203.	20.81	1.50	9.541E-03	77.11	10.700	1.335E+00	PB214
					77.11	17.500	8.160E-01	PB212
77.19	203.	20.81	1.50	9.541E-03	77.11	10.700	1.335E+00	PB214
					77.11	17.500	8.160E-01	PB212
185.88	82.	38.92	1.11	1.627E-02				
185.88	82.	38.92	1.11	1.627E-02	185.99	3.280	PBC<MDA	RA226
209.94	68.	33.74	1.29	1.516E-02				
239.10	606.	4.83	1.22	1.378E-02	238.63	43.100	6.843E-01	PB212
242.19	90.	22.81	1.22	1.364E-02	241.00	3.900	PBC<MDA	RA224
					241.92	7.470	5.942E-01	PB214
295.67	113.	14.61	1.25	1.146E-02	295.22	19.200	3.439E-01	PB214
328.87	34.	40.11	0.53	1.034E-02				
339.10	148.	16.14	1.50	1.004E-02	338.40	12.010	8.227E-01	AC228
352.71	251.	10.42	1.26	9.659E-03	351.99	37.100	4.686E-01	PB214
463.81	44.	35.68	1.46	7.360E-03	463.51	10.000	PBC<MDA	SB125
511.43	113.	17.56	1.89	6.686E-03	510.72	22.500	5.038E-01	TL208
584.20	214.	11.21	1.86	5.880E-03	583.14	86.000	2.835E-01	TL208
610.54	138.	13.60	1.08	5.639E-03	609.32	46.090	3.549E-01	BI214
728.59	60.	22.99	1.05	4.786E-03	727.17	11.800	7.124E-01	BI212
796.17	25.	37.75	0.96	4.418E-03	795.76	85.400	4.538E-02	CS134
912.95	114.	13.10	1.28	3.915E-03	911.07	29.000	6.736E-01	AC228
969.76	106.	13.94	1.84	3.715E-03	968.90	17.460	1.102E+00	AC228
1122.11	53.	25.56	1.20	3.279E-03				
1463.40	441.	4.88	1.74	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	
419.50	209.94	219.	68.	0.034	101.21	1.293	NP-239	sM

Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM	Suspected	
477.83	239.14	126.	606.	0.303	14.50	1.215	PB-212	D
484.01	242.23	167.	90.	0.045	68.44	1.217	PB-214	D
657.42	328.87	76.	34.	0.017	120.34	0.534	LA-140	sM
1592.36	796.17	26.	25.	0.013	113.26	0.959	PA-234	l
1939.72	969.76	94.	47.	0.024	97.22	1.841	AC-228	sM
2245.02	1122.11	16.	43.	0.021	60.98	1.820	TA-182	D
2927.72	1463.40	10.	438.	0.219	14.65	1.739	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	790.	203.	0.101	62.44	1.500D
PB-212	153.80	77.11	790.	203.	0.101	62.44	1.500D
PB-212	477.86	239.11	391.	503.	0.251	21.39	1.500
PB-214	591.29	295.82	133.	115.	0.057	51.03	1.500
AC-228	677.69	339.01	124.	130.	0.065	44.82	1.500
PB-214	705.00	352.66	90.	238.	0.119	25.71	1.500
TL-208	1022.47	511.35	78.	117.	0.058	52.38	1.896s
TL-208	1168.22	584.20	93.	214.	0.107	33.62	1.858s
BI-214	1220.94	610.54	64.	138.	0.069	40.80	1.078
BI-212	1457.38	728.71	29.	49.	0.024	63.35	1.554
AC-228	1825.69	912.77	35.	84.	0.042	44.06	1.679
AC-228	1941.98	970.89	39.	59.	0.030	59.12	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		-2.7263E-02					
			477.56	-2.726E-02	%(	4.082E-01 1.17E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
K-40	6.5857E-02						
		1460.75	6.586E-02	%(P	3.836E-01	1.04E-01	G
MN-54	1.1791E-03						
		834.81	1.179E-03	%(P	4.549E-02	1.25E-02	G
CO-57	2.4622E-03						
		122.07	2.462E-03	%(	5.561E-02	1.65E-02	G K
		136.43	9.119E-02	&	3.885E-01	1.16E-01	G
CO-60	-9.9668E-04						
		1332.51	-9.967E-04	%(P	6.465E-02	1.77E-02	G K
		1173.23	1.100E-03	&	6.376E-02	1.77E-02	G K
Sr-85	-8.2578E-03						
		514.00	-8.258E-03	&(	5.782E-02	1.69E-02	G
Kr-85	-1.8195E+02						
		513.99	-1.819E+02	&(	1.275E+03	3.73E+02	G
Y-88	1.1418E-02						
		1836.01	1.142E-02	%(P	2.670E-02	8.15E-03	G K
		898.02	-6.529E-04	% P	4.700E-02	1.26E-02	G
NB-94	7.0743E-03						
		871.10	7.074E-03	%(	3.824E-02	1.08E-02	G K
		702.50	6.474E-03	%	3.762E-02	1.07E-02	G K
Ag-108M	-5.2570E-05						
		722.95	-5.257E-05	%(	4.676E-02	1.29E-02	G K
		614.37	-2.521E-02	% P	6.571E-02	1.97E-02	G
		433.93	1.486E-02	%	3.477E-02	1.05E-02	G
CD-109	-3.6833E-02						
		88.04	-3.683E-02	%(P	2.087E+00	6.21E-01	G
SN-113	9.5392E-03						
		391.71	9.539E-03	&(	5.886E-02	1.72E-02	G K
		255.04	6.532E-01	%	1.818E+00	5.46E-01	G
SB-125	-7.2983E-03						
		427.95	-7.298E-03	%(P	1.137E-01	3.21E-02	G K
		600.77	5.857E-03	% P	1.937E-01	5.38E-02	G
		636.15	-2.637E-02	% P	3.188E-01	8.91E-02	G
		463.51	2.813E-01	% P	3.861E-01	1.20E-01	G
		176.29	1.583E-02	% P	6.214E-01	1.83E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
I-131	1.9191E-02						
		364.48	1.919E-02	%(	4.827E-02	1.45E-02	G K
		636.97	-1.188E-01	&	8.444E-01	2.42E-01	G
		284.29	-1.192E-01	%	9.366E-01	2.76E-01	G
CS-134	1.0768E-02						
		604.66	1.077E-02	&(	3.136E-02	9.26E-03	G K
		795.76	2.091E-02	%	4.947E-02	1.49E-02	G
		569.29	-2.157E-02	&	2.855E-01	8.17E-02	G
		801.84	-4.853E-02	& P	5.493E-01	1.55E-01	G
CS-137	2.2802E-02						
		661.62	2.280E-02	%(	4.810E-02	1.46E-02	G
CE-139	-1.8479E-03						
		165.85	-1.848E-03	%(P	4.790E-02	1.41E-02	G
EU-152	4.2840E-03						
		121.78	4.284E-03	%(P	1.608E-01	4.77E-02	G K
		344.30	-1.271E-03	%	1.296E-01	3.73E-02	G
		1408.08	-7.634E-03	&	2.490E-01	6.66E-02	G
		964.00	-1.190E-01	% P	4.950E-01	1.45E-01	G
		1112.07	-5.777E-03	%	3.721E-01	1.01E-01	G
		778.90	-2.596E-03	% P	3.755E-01	1.04E-01	G
EU-154	9.0418E-03						
		123.10	9.042E-03	%(P	9.865E-02	2.93E-02	G K
		1274.80	1.314E-02	%	1.599E-01	4.42E-02	G
		723.30	-6.856E-02	% P	2.654E-01	7.77E-02	G
		1004.80	-8.336E-03	&	3.043E-01	8.42E-02	G
EU-155	2.2533E-03						
		86.45	2.253E-03	%(P	2.237E-01	6.64E-02	G K
		105.31	5.278E-02	%	2.241E-01	6.71E-02	G
HG-203	-5.5345E-04						
		279.17	-5.535E-04	&(P	5.144E-02	1.50E-02	G K
		72.87	-1.031E+00	&	2.140E+00	6.49E-01	G
		70.83	-4.151E-01	&	3.826E+00	1.14E+00	G
		82.50	-6.590E-01	&	3.576E+00	1.07E+00	G
TL-208	2.8348E-01						
		583.14	2.835E-01	*(P	6.325E-02	3.19E-02	G
		510.72	5.199E-01	+	1.961E-01	9.09E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
PB-212	5.6736E-01						
		238.63	5.674E-01	(	1.070E-01	4.04E-02	G K
							Energy duplication
		77.11	8.160E-01	+	5.377E-01	1.70E-01	G
		74.81	7.781E-01	& P	1.151E+00	3.51E-01	G
PB-214	4.4531E-01						
		351.99	4.453E-01	(P	8.773E-02	3.82E-02	G K
		295.22	3.496E-01	-	1.720E-01	5.95E-02	G
							Energy duplication
		77.11	1.335E+00	+	8.794E-01	2.78E-01	G
		241.92	3.364E-01	%	6.906E-01	2.10E-01	G
BI-212	5.8119E-01						
		727.17	5.812E-01	(	3.299E-01	1.23E-01	G K
		1620.56	-1.637E-01	% P	1.828E+00	4.78E-01	G
		785.42	7.654E-01	% P	2.050E+00	6.09E-01	G
BI-214	3.5494E-01						
		609.32	3.549E-01	(	1.035E-01	4.84E-02	G K
		1764.51	1.601E-03	& P	4.306E-01	1.15E-01	G
		1120.28	-1.602E-01	%	4.615E-01	1.37E-01	G
RA-224	6.7071E-01						
		241.00	6.707E-01	&(P	1.270E+00	3.86E-01	G
RA-226	8.8192E-01						
		185.99	8.819E-01	%(P	1.248E+00	3.82E-01	G
AC-228	5.7727E-01						
		911.07	4.956E-01	(P	1.777E-01	7.30E-02	G K
		968.90	6.124E-01	(P	3.273E-01	1.21E-01	G
		338.40	7.234E-01	(	3.034E-01	1.08E-01	G
TH-227	1.6697E-02						
		236.00	1.670E-02	&(P	3.386E-01	9.96E-02	G K
		256.25	1.768E-01	&	5.317E-01	1.59E-01	G
PA-234	-5.4071E-02						
		98.44	-5.407E-02	&(	2.360E-01	7.08E-02	G K
		946.00	-2.537E-02	%	2.440E-01	6.84E-02	G
		131.28	-6.697E-02	%	2.386E-01	7.17E-02	G
		94.67	-5.588E-03	%	4.283E-01	1.27E-01	G
		883.24	7.059E-02	%	3.732E-01	1.07E-01	G
		926.70	3.637E-02	%	3.529E-01	9.71E-02	G
		569.26	-3.220E-02	&	4.220E-01	1.21E-01	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments

TH-234      -5.7707E-03
                           63.29-5.771E-03 %(P 4.473E+00 1.33E+00 G K
                           92.80 1.582E+00 %   2.259E+00 6.91E-01 G
                           92.38 7.083E-02 % P 2.512E+00 7.47E-01 G

AM-241      -1.5308E-01
                           59.54-1.531E-01 &(  6.105E-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:                      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	-2.5778E-02	-2.7263E-02	3.5119E-01	3.5119E-01	3.859E-01
K-40	A	6.5857E-02	6.5857E-02	3.1239E-01	3.1241E-01	3.836E-01
MN-54	#A	1.1679E-03	1.1791E-03	3.7622E-02	3.7622E-02	4.505E-02
CO-57	#B	2.4351E-03	2.4622E-03	4.9570E-02	4.9570E-02	5.500E-02
CO-60	#B	-9.9513E-04	-9.9668E-04	7.7236E-02	7.7236E-02	6.455E-02
Sr-85	#A	-7.8855E-03	-8.2578E-03	5.0801E-02	5.0803E-02	5.522E-02

Kr-85	#A	-1.8194E+02	-1.8195E+02	1.1199E+03	1.1200E+03	1.275E+03
Y-88	#B	1.1102E-02	1.1418E-02	2.4460E-02	2.4468E-02	2.596E-02
NB-94	#B	7.0743E-03	7.0743E-03	3.2409E-02	3.2411E-02	3.824E-02
Ag-108M	#B	-5.2567E-05	-5.2570E-05	3.8786E-02	3.8786E-02	4.676E-02
CD-109	#A	-3.6590E-02	-3.6833E-02	7.0619E+00	7.0619E+00	2.073E+00
SN-113	#B	9.2945E-03	9.5392E-03	5.1577E-02	5.1580E-02	5.735E-02
SB-125	#B	-7.2768E-03	-7.2983E-03	2.2010E-01	2.2010E-01	1.134E-01
I-131	#B	1.3229E-02	1.9191E-02	4.3410E-02	4.3424E-02	3.327E-02
CS-134	#B	1.0726E-02	1.0768E-02	2.7766E-02	2.7772E-02	3.124E-02
CS-137	#A	2.2796E-02	2.2802E-02	4.3761E-02	4.3779E-02	4.808E-02
CE-139	#A	-1.8081E-03	-1.8479E-03	5.3919E-02	5.3919E-02	4.687E-02
EU-152	#B	4.2812E-03	4.2840E-03	1.4312E-01	1.4312E-01	1.607E-01
EU-154	#B	9.0331E-03	9.0418E-03	8.7838E-02	8.7839E-02	9.856E-02
EU-155	#B	2.2496E-03	2.2533E-03	1.9923E-01	1.9923E-01	2.233E-01
HG-203	#B	-5.1904E-04	-5.5345E-04	5.7568E-02	5.7568E-02	4.824E-02
TL-208	#	2.8348E-01	2.8348E-01	9.5479E-02	9.6795E-02	
PB-212	#	5.6736E-01	5.6736E-01	1.2134E-01	1.2545E-01	1.070E-01
PB-214	#	4.4531E-01	4.4531E-01	1.1467E-01	1.1736E-01	8.773E-02
BI-212		5.8119E-01	5.8119E-01	3.6818E-01	3.6963E-01	3.299E-01
BI-214		3.5494E-01	3.5494E-01	1.4480E-01	1.4616E-01	
RA-224	#A	6.7071E-01	6.7071E-01	1.1574E+00	1.1580E+00	1.270E+00
RA-226	#A	8.8191E-01	8.8192E-01	1.1467E+00	1.1478E+00	1.248E+00
AC-228		5.7727E-01	5.7727E-01	1.6619E-01	1.6932E-01	1.777E-01
TH-227	#B	1.6697E-02	1.6697E-02	2.9867E-01	2.9867E-01	3.386E-01
PA-234	#B	-5.4071E-02	-5.4071E-02	2.1243E-01	2.1245E-01	2.360E-01
TH-234	#B	-5.7707E-03	-5.7707E-03	1.1606E+01	1.1606E+01	4.473E+00
AM-241	#A	-1.5308E-01	-1.5308E-01	5.4940E-01	5.4947E-01	6.105E-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) 1.7968860E+00 pCi/gm
Total Decayed Activity (1460.5 to 1999.0 keV) 1.7968860E+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_1AUG2006_1644.An1

Sample description
FSS-OOL-10-01-015-F

Spectrum Filename: C:\GammaVision\Spectra\102F_1AUG2006_1644.An1

Acquisition information
Start time: 01-Aug-2006 16:44:14
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: 2.0230E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 2.0230E+03) =
4.9432E+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	28-Jul-2006 08:50:00
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. 12 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.7058

***** 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
77.23	198.	21.92	1.50	9.541E-03	77.11	10.700	1.293E+00	PB214
					77.11	17.500	7.906E-01	PB212
77.23	198.	21.92	1.50	9.541E-03	77.11	10.700	1.293E+00	PB214
					77.11	17.500	7.906E-01	PB212
92.59	107.	37.19	1.74	1.329E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	1.780E+00	TH234
					94.67	15.500	3.358E-01	PA234
129.83	113.	30.69	1.05	1.718E-02				
129.83	113.	30.69	1.05	1.718E-02	131.28	20.000	2.195E-01	PA234
185.83	118.	27.69	1.41	1.627E-02				
185.83	118.	27.69	1.41	1.627E-02	185.99	3.280	1.415E+00	RA226
209.33	84.	34.53	1.48	1.519E-02				
239.11	497.	5.44	1.22	1.379E-02	238.63	43.100	5.584E-01	PB212
242.29	93.	21.53	1.22	1.364E-02	241.00	3.900	PBC<MDA	RA224
					241.92	7.470	6.104E-01	PB214
270.68	66.	31.01	1.41	1.241E-02				
295.51	152.	17.39	1.45	1.145E-02	295.22	19.200	4.609E-01	PB214
338.68	156.	18.48	1.30	1.005E-02	338.40	12.010	8.647E-01	AC228
352.59	260.	11.38	1.26	9.662E-03	351.99	37.100	4.837E-01	PB214
464.45	40.	34.67	1.10	7.350E-03	463.51	10.000	PBC<MDA	SB125
512.09	97.	17.16	1.93	6.677E-03	510.72	22.500	4.302E-01	TL208
					513.99	0.004	2.265E+03	Kr85
					514.00	99.270	1.028E-01	Sr85
584.01	164.	12.15	1.34	5.882E-03	583.14	86.000	2.163E-01	TL208
610.64	188.	10.43	1.01	5.638E-03	609.32	46.090	4.828E-01	BI214
728.49	61.	21.38	1.42	4.786E-03	727.17	11.800	7.250E-01	BI212
784.95	27.	30.68	0.68	4.472E-03	785.42	2.000	2.014E+00	BI212

912.99	68.	15.74	0.82	3.915E-03				
970.23	87.	18.78	1.38	3.713E-03				
1121.92	56.	26.27	1.33	3.279E-03	1120.28	15.040	7.549E-01	BI214
1463.33	485.	4.60	1.96	2.617E-03	1460.75	10.700	1.154E+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	
184.75	92.59	610.	107.	0.053	111.57	1.745	PB-214	l
259.26	129.83	457.	77.	0.039	121.84	1.053	AC-228	sM
418.28	209.33	293.	84.	0.042	103.60	1.482	AC-228	sM
477.86	239.01	117.	497.	0.249	16.31	1.215	PB-212	D
484.20	242.18	155.	93.	0.047	64.60	1.217	PB-214	D
541.01	270.68	147.	66.	0.033	93.02	1.405	AC-228	M
928.66	464.45	56.	40.	0.020	104.01	1.102	SB-125	l
1826.12	912.99	19.	71.	0.035	44.31	0.825	-	sM
1940.67	970.23	41.	91.	0.046	43.29	1.378	AC-228	M
2244.52	1121.92	22.	42.	0.021	66.42	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-214	153.80	77.11	839.	198.	0.099	65.75	1.500D
PB-212	153.80	77.11	839.	198.	0.099	65.75	1.500D
PB-212	477.89	239.13	355.	413.	0.207	24.32	1.500
RA-224	483.42	241.89	373.	83.	0.042	102.56	1.500
PB-214	483.55	241.96	396.	74.	0.037	119.55	1.500
PB-214	591.22	295.78	194.	143.	0.071	48.42	1.500s
AC-228	677.70	339.01	118.	130.	0.065	44.12	1.500
PB-214	704.88	352.60	100.	251.	0.125	25.34	1.500
TL-208	1023.96	512.09	60.	97.	0.049	51.47	1.932s
TL-208	1167.86	584.01	76.	164.	0.082	36.44	1.337
BI-214	1221.13	610.64	60.	188.	0.094	31.30	1.012
BI-212	1456.94	728.49	40.	61.	0.031	64.13	1.417
BI-212	1569.90	784.95	16.	27.	0.013	92.03	0.683s
BI-214	2240.95	1120.28	38.	37.	0.019	85.66	1.819D
K-40	2927.72	1463.41	5.	472.	0.236	13.94	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		-1.8181E-03					
			477.56	-1.818E-03	%(	3.487E-01 9.80E-02	G
K-40		1.1255E+01					
			1460.75	1.126E+01	(P	3.147E-01 5.23E-01	G
MN-54		1.5556E-02					
			834.81	1.556E-02	&(P	4.629E-02 1.37E-02	G
CO-57		6.7453E-04					
			122.07	6.745E-04	%(	4.961E-02 1.47E-02	G K
			136.43	4.249E-02	%	3.964E-01 1.18E-01	G
CO-60		1.8235E-02					
			1332.51	1.823E-02	%(P	4.833E-02 1.43E-02	G K
			1173.23	0.000E+00	%	7.766E-02 2.18E-02	G K
Sr-85		-1.0709E-02					
			514.00	-1.071E-02	&(	5.466E-02 1.61E-02	G
Kr-85		-2.3656E+02					
			513.99	-2.366E+02	&(	1.205E+03 3.54E+02	G
Y-88		-6.0568E-03					
			1836.01	-6.057E-03	%(P	5.693E-02 1.53E-02	G K
			898.02	1.150E-02	& P	5.611E-02 1.61E-02	G
NB-94		7.2461E-03					
			871.10	7.246E-03	%(	4.176E-02 1.18E-02	G K
			702.50	-1.391E-02	%	4.694E-02 1.38E-02	G K
Ag-108M		-8.6750E-03					
			722.95	-8.675E-03	&(	5.954E-02 1.72E-02	G K
			614.37	-1.814E-02	& P	6.889E-02 2.04E-02	G
			433.93	1.552E-02	%	3.873E-02 1.16E-02	G
CD-109		1.1945E+00					
			88.04	1.194E+00	%(P	1.924E+00 5.87E-01	G
SN-113		-8.6673E-03					
			391.71	-8.667E-03	&(	5.828E-02 1.70E-02	G K
			255.04	4.534E-01	%	1.763E+00 5.25E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	-5.0790E-03						
		427.95	-5.079E-03	&(P	1.363E-01	3.89E-02	G K
		600.77	6.157E-02	& P	2.127E-01	6.25E-02	G
		636.15	-4.492E-03	& P	2.938E-01	8.03E-02	G
		463.51	2.411E-01	% P	3.681E-01	1.14E-01	G
		176.29	8.041E-02	& P	5.540E-01	1.64E-01	G
I-131	-5.0931E-03						
		364.48	-5.093E-03	&(	6.055E-02	1.75E-02	G K
		636.97	-1.699E-05	%	6.789E-01	1.86E-01	G
		284.29	-7.346E-03	%	7.534E-01	2.18E-01	G
CS-134	-8.8101E-04						
		604.66	-8.810E-04	%(	4.557E-02	1.29E-02	G K
		795.76	3.674E-02	%	5.151E-02	1.63E-02	G
		569.29	-1.325E-02	%	2.517E-01	7.11E-02	G
		801.84	-5.293E-02	% P	4.504E-01	1.26E-01	G
CS-137	7.0306E-03						
		661.62	7.031E-03	&(	5.257E-02	1.51E-02	G
CE-139	4.1078E-03						
		165.85	4.108E-03	%(P	4.749E-02	1.41E-02	G
EU-152	1.5788E-02						
		121.78	1.579E-02	%(P	1.446E-01	4.30E-02	G K
		344.30	3.178E-02	%	1.201E-01	3.55E-02	G
		1408.08	1.124E-03	&	2.411E-01	6.37E-02	G
		964.00	-1.026E-02	& P	3.099E-01	8.41E-02	G
		1112.07	7.768E-02	%	4.224E-01	1.21E-01	G
		778.90	2.145E-03	% P	3.373E-01	9.30E-02	G
EU-154	3.7309E-02						
		123.10	3.731E-02	%(P	1.047E-01	3.16E-02	G K
		1274.80	4.361E-02	&	1.340E-01	3.91E-02	G
		723.30	-1.580E-03	& P	3.582E-01	1.03E-01	G
		1004.80	3.162E-03	&	3.028E-01	8.34E-02	G
EU-155	1.2919E-01						
		86.45	1.292E-01	&(P	2.338E-01	7.10E-02	G K
		105.31	4.625E-03	&	2.014E-01	5.96E-02	G
HG-203	1.5892E-02						
		279.17	1.589E-02	%(P	4.566E-02	1.37E-02	G K
		72.87	-2.139E-01	%	2.013E+00	6.02E-01	G
		70.83	-1.230E+00	&	3.669E+00	1.11E+00	G
		82.50	2.137E-02	&	4.013E+00	1.19E+00	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	2.1627E-01						
		583.14	2.163E-01	(P	5.715E-02	2.64E-02	G
		510.72	4.302E-01	+	1.721E-01	7.40E-02	G
PB-212	4.6423E-01						
		238.63	4.642E-01	(	1.016E-01	3.76E-02	G K
							Energy duplication
		77.11	7.906E-01	+	5.509E-01	1.73E-01	G
		74.81	6.507E-01	& P	1.125E+00	3.42E-01	G
PB-214	4.5831E-01						
		351.99	4.661E-01	(P	9.155E-02	3.94E-02	G K
		295.22	4.335E-01	(	2.054E-01	7.00E-02	G
							Energy duplication
		77.11	1.293E+00	+	9.009E-01	2.83E-01	G
		241.92	4.836E-01	&(	6.251E-01	1.93E-01	G
BI-212	7.2503E-01						
		727.17	7.250E-01	(	3.783E-01	1.55E-01	G K
		1620.56	-3.400E-02	% P	1.663E+00	4.13E-01	G
		785.42	2.014E+00	+ P	1.596E+00	6.18E-01	G
BI-214	4.8852E-01						
		609.32	4.828E-01	(	9.940E-02	5.05E-02	G K
		1764.51	-6.977E-02	& P	4.453E-01	1.25E-01	G
		1120.28	5.060E-01	(	4.269E-01	1.44E-01	G
RA-224	1.0380E+00						
		241.00	1.038E+00	(P	1.159E+00	3.60E-01	G
RA-226	8.3269E-01						
		185.99	8.327E-01	%(P	1.205E+00	3.69E-01	G
AC-228	1.9835E-01						
		911.07	-1.728E-02	%(P	2.111E-01	5.99E-02	G K
		968.90	-4.271E-02	% P	3.925E-01	1.13E-01	G
		338.40	7.190E-01	(	2.947E-01	1.06E-01	G
TH-227	6.8356E-03						
		236.00	6.836E-03	&(P	2.920E-01	8.52E-02	G K
		256.25	1.727E-01	%	4.804E-01	1.44E-01	G
PA-234	1.1538E-03						
		98.44	1.154E-03	%(	2.190E-01	6.49E-02	G K
		946.00	-4.696E-03	&	1.952E-01	5.24E-02	G
		131.28	6.923E-02	&	2.006E-01	6.04E-02	G
		94.67	4.861E-03	%	4.124E-01	1.23E-01	G
		883.24	1.227E-01	%	3.507E-01	1.04E-01	G
		926.70	1.977E-01	%	4.070E-01	1.24E-01	G

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 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26 4.950E-04 %   4.051E-01 1.14E-01 G

TH-234       8.2164E-02
                           63.29 8.216E-02 &(P 4.096E+00 1.21E+00 G K
                           92.80 1.552E+00 %   2.233E+00 6.83E-01 G
                           92.38 1.752E+00 % P 2.681E+00 8.19E-01 G

AM-241      -4.7916E-03
                           59.54-4.792E-03 &(  6.153E-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	-1.7187E-03	-1.8181E-03	2.9405E-01	2.9405E-01	3.296E-01
K-40		1.1255E+01	1.1255E+01	1.5698E+00	1.6921E+00	3.147E-01
MN-54	#A	1.5407E-02	1.5556E-02	4.0966E-02	4.0975E-02	4.584E-02
CO-57	#B	6.6708E-04	6.7453E-04	4.4045E-02	4.4045E-02	4.906E-02
CO-60	#B	1.8206E-02	1.8235E-02	4.2909E-02	4.2922E-02	4.826E-02

Sr-85	#A	-1.0225E-02	-1.0709E-02	4.8225E-02	4.8229E-02	5.219E-02
Kr-85	#A	-2.3656E+02	-2.3656E+02	1.0631E+03	1.0632E+03	1.205E+03
Y-88	#B	-5.8887E-03	-6.0568E-03	4.6147E-02	4.6149E-02	5.535E-02
NB-94	#B	7.2461E-03	7.2461E-03	3.5515E-02	3.5518E-02	4.176E-02
Ag-108M	#B	-8.6744E-03	-8.6750E-03	5.1596E-02	5.1599E-02	5.953E-02
CD-109	#A	1.1866E+00	1.1945E+00	1.7598E+00	1.7611E+00	1.911E+00
SN-113	#B	-8.4442E-03	-8.6673E-03	5.0976E-02	5.0978E-02	5.678E-02
SB-125	#B	-5.0640E-03	-5.0790E-03	4.1264E-01	4.1264E-01	1.359E-01
I-131	#B	-3.5066E-03	-5.0931E-03	5.2533E-02	5.2533E-02	4.169E-02
CS-134	#B	-8.7751E-04	-8.8101E-04	3.8632E-02	3.8632E-02	4.539E-02
CS-137	#A	7.0287E-03	7.0306E-03	4.5208E-02	4.5210E-02	5.256E-02
CE-139	#A	4.0191E-03	4.1078E-03	4.2207E-02	4.2208E-02	4.646E-02
EU-152	#B	1.5778E-02	1.5788E-02	1.2897E-01	1.2898E-01	1.445E-01
EU-154	#B	3.7273E-02	3.7309E-02	9.4656E-02	9.4679E-02	1.046E-01
EU-155	#B	1.2897E-01	1.2919E-01	2.1315E-01	2.1327E-01	2.334E-01
HG-203	#B	1.4901E-02	1.5892E-02	4.1063E-02	4.1073E-02	4.282E-02
TL-208		2.1627E-01	2.1627E-01	7.9002E-02	7.9929E-02	
PB-212	#	4.6423E-01	4.6423E-01	1.1289E-01	1.1586E-01	1.016E-01
PB-214	#	4.5831E-01	4.5831E-01	1.1633E-01	1.1914E-01	9.155E-02
BI-212		7.2503E-01	7.2503E-01	4.6497E-01	4.6675E-01	
BI-214		4.8852E-01	4.8852E-01	1.5290E-01	1.5534E-01	
RA-224	#A	1.0380E+00	1.0380E+00	1.0795E+00	1.0811E+00	1.159E+00
RA-226	#A	8.3269E-01	8.3269E-01	1.1062E+00	1.1072E+00	1.205E+00
AC-228	B	1.9835E-01	1.9835E-01	8.7507E-02	8.8212E-02	2.111E-01
TH-227	#B	6.8356E-03	6.8356E-03	2.5568E-01	2.5568E-01	2.920E-01
PA-234	#B	1.1538E-03	1.1538E-03	1.9482E-01	1.9482E-01	2.190E-01
TH-234	#B	8.2164E-02	8.2164E-02	3.6449E+00	3.6449E+00	4.096E+00
AM-241	#A	-4.7915E-03	-4.7916E-03	5.4727E-01	5.4727E-01	6.152E-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) 1.2883451E+01 pCi/gm
Total Decayed Activity (1460.5 to 1999.0 keV) 1.2883451E+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_1AUG2006_1721.An1

Sample description
FSS-OOL-10-01-020-F

Spectrum Filename: C:\GammaVision\Spectra\102F_1AUG2006_1721.An1

Acquisition information
Start time: 01-Aug-2006 17:21:09
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: 1.9080E+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	28-Jul-2006 09:55:00
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. 12 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.7660

***** 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
77.17	147.	30.09	1.50	9.541E-03	77.11	10.700	1.021E+00	PB214
					77.11	17.500	6.241E-01	PB212
77.17	147.	30.09	1.50	9.541E-03	77.11	10.700	1.021E+00	PB214
					77.11	17.500	6.241E-01	PB212
128.22	106.	34.40	0.99	1.712E-02				
186.32	72.	32.03	0.93	1.625E-02	185.99	3.280	PBC<MDA	RA226
209.44	94.	27.20	1.68	1.519E-02				
239.53	739.	6.06	1.14	1.376E-02	238.63	43.100	8.797E-01	PB212
					241.00	3.900	9.784E+00	RA224
295.82	144.	11.85	1.26	1.145E-02	295.22	19.200	4.639E-01	PB214
301.00	53.	26.46	1.26	1.127E-02				
339.03	135.	19.81	0.83	1.004E-02	338.40	12.010	7.937E-01	AC228
352.59	272.	10.66	1.49	9.662E-03	351.99	37.100	5.365E-01	PB214
463.93	46.	30.53	1.39	7.358E-03	463.51	10.000	4.288E-01	SB125
511.95	91.	19.62	1.58	6.679E-03	510.72	22.500	4.260E-01	TL208
					513.99	0.004	2.243E+03	Kr85
					514.00	99.270	1.017E-01	Sr85
584.40	194.	10.86	1.46	5.878E-03	583.14	86.000	2.708E-01	TL208
610.61	169.	12.04	1.71	5.638E-03	609.32	46.090	4.597E-01	BI214
796.24	26.	38.40	1.60	4.420E-03	795.76	85.400	PBC<MDA	CS134
912.74	130.	11.32	1.53	3.916E-03				
970.19	76.	23.03	1.44	3.714E-03				
1122.35	38.	27.45	1.82	3.283E-03	1120.28	15.040	5.446E-01	BI214
1463.47	556.	4.32	2.23	2.617E-03	1460.75	10.700	1.405E+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	
256.03	128.22	453.	137.	0.068	70.84	0.994	AC-228	sM

Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM	Suspected	
418.50	209.44	240.	94.	0.047	81.59	1.680	AC-228	sM
601.19	300.77	87.	59.	0.030	78.90	1.302	PB-212	M
1825.62	912.74	36.	128.	0.064	33.14	1.526	AC-228	M
1940.59	970.19	62.	76.	0.038	56.01	1.436	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	906.	147.	0.074	90.26	1.500D
PB-212	153.80	77.11	906.	147.	0.074	90.26	1.500D
RA-226	372.33	186.36	418.	75.	0.037	113.88	1.500
PB-212	477.84	239.10	403.	530.	0.265	20.69	1.500
RA-224	477.85	239.11	247.	558.	0.279	17.38	1.500s
PB-214	591.19	295.77	154.	148.	0.074	43.27	1.500
AC-228	677.81	339.07	151.	115.	0.058	53.19	1.500
PB-214	704.95	352.63	160.	210.	0.105	32.87	1.500
SB-125	928.10	464.18	77.	40.	0.020	99.94	1.500
TL-208	1023.67	511.95	70.	91.	0.045	58.85	1.583s
Kr-85	1023.26	511.74	67.	49.	0.025	82.60	1.499s
Sr-85	1023.27	511.74	67.	49.	0.024	83.67	1.499s
TL-208	1168.63	584.40	76.	194.	0.097	32.59	1.455s
BI-214	1221.07	610.61	70.	169.	0.084	36.12	1.712
Ag-108M	1224.82	612.48	171.	-50.	-0.025	119.80	1.499s
CS-134	1592.51	796.24	36.	26.	0.013	115.21	1.601s
BI-214	2245.09	1122.35	35.	38.	0.019	82.35	1.819
K-40	2928.01	1463.55	26.	521.	0.260	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		6.0680E-02					
			477.56	6.068E-02	%(	3.976E-01 1.15E-01	G
K-40		1.3150E+01					
			1460.75	1.315E+01	(P	6.697E-01 6.04E-01	G
MN-54		1.2940E-02					
			834.81	1.294E-02	%(P	5.164E-02 1.50E-02	G
CO-57		-4.6632E-03					
			122.07	-4.663E-03	%(	5.608E-02 1.67E-02	G K
			136.43	-3.235E-03	%	3.934E-01 1.16E-01	G
CO-60		2.3576E-03					
			1332.51	2.358E-03	%(P	6.711E-02 1.85E-02	G K
			1173.23	-1.828E-02	&	8.150E-02 2.38E-02	G K
Sr-85		5.4513E-02					
			514.00	5.451E-02	&(	4.600E-02 1.52E-02	G
Kr-85		1.2136E+03					
			513.99	1.214E+03	&(	1.008E+03 3.34E+02	G
Y-88		-2.2395E-05					
			1836.01	-2.239E-05	%(P	2.515E-02 3.41E-03	G K
			898.02	-1.155E-02	& P	6.307E-02 1.80E-02	G
NB-94		5.8336E-04					
			871.10	5.834E-04	%(	3.902E-02 1.05E-02	G K
			702.50	-3.128E-03	%	5.132E-02 1.46E-02	G K
Ag-108M		1.4580E-02					
			722.95	1.458E-02	&(	4.378E-02 1.29E-02	G K
			614.37	-6.945E-02	& P	8.891E-02 2.76E-02	G
			433.93	-1.879E-02	%	4.943E-02 1.48E-02	G
CD-109		-1.1992E-01					
			88.04	-1.199E-01	%(P	2.298E+00 6.85E-01	G
SN-113		1.0191E-02					
			391.71	1.019E-02	%(	7.073E-02 2.07E-02	G K
			255.04	-3.068E-02	&	1.841E+00 5.37E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	6.7948E-02						
		427.95	-3.949E-02	%(P	1.571E-01	4.62E-02	G K
		600.77	-3.816E-02	% P	2.774E-01	8.02E-02	G
		636.15	-5.789E-02	& P	4.529E-01	1.30E-01	G
		463.51	3.860E-01	(P	4.196E-01	1.34E-01	G
		176.29	-2.222E-02	% P	7.098E-01	2.09E-01	G
I-131	-8.7889E-03						
		364.48	-8.789E-03	&(	6.432E-02	1.87E-02	G K
		636.97	-1.560E-01	&	9.681E-01	2.80E-01	G
		284.29	1.010E-01	&	9.295E-01	2.73E-01	G
CS-134	2.7511E-02						
		604.66	8.955E-03	%(	4.479E-02	1.30E-02	G K
		795.76	4.872E-02	*(	5.806E-02	1.87E-02	G
		569.29	6.949E-02	%	2.524E-01	7.40E-02	G
		801.84	1.313E-01	% P	5.436E-01	1.58E-01	G
CS-137	-6.7789E-03						
		661.62	-6.779E-03	&(	6.222E-02	1.79E-02	G
CE-139	4.7914E-03						
		165.85	4.791E-03	%(P	5.302E-02	1.57E-02	G
EU-152	-3.3347E-02						
		121.78	-3.335E-02	&(P	1.692E-01	5.06E-02	G K
		344.30	-2.484E-02	%	1.562E-01	4.60E-02	G
		1408.08	-4.866E-03	%	2.762E-01	7.41E-02	G
		964.00	-2.542E-02	& P	4.402E-01	1.24E-01	G
		1112.07	1.801E-03	&	5.192E-01	1.45E-01	G
		778.90	-4.309E-02	& P	4.140E-01	1.18E-01	G
EU-154	-1.1228E-02						
		123.10	-1.123E-02	%(P	1.253E-01	3.73E-02	G K
		1274.80	-1.742E-02	%	1.860E-01	5.20E-02	G
		723.30	-6.214E-02	& P	2.629E-01	7.65E-02	G
		1004.80	1.139E-02	%	3.138E-01	8.68E-02	G
EU-155	1.3813E-01						
		86.45	1.381E-01	%(P	2.581E-01	7.84E-02	G K
		105.31	1.427E-02	%	2.570E-01	7.65E-02	G
HG-203	-1.0893E-02						
		279.17	-1.089E-02	&(P	5.696E-02	1.69E-02	G K
		72.87	-6.612E-01	%	2.260E+00	6.81E-01	G
		70.83	-3.210E-01	%	3.282E+00	9.77E-01	G
		82.50	-1.338E+00	%	4.563E+00	1.37E+00	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	2.7083E-01						
		583.14	2.708E-01	@(P	6.071E-02	2.95E-02	G
		510.72	4.260E-01	+	1.966E-01	8.38E-02	G
PB-212	6.2909E-01						
		238.63	6.311E-01	(	1.146E-01	4.35E-02	G K
							Energy duplication
		77.11	6.241E-01	@(	6.066E-01	1.88E-01	G
		74.81	8.376E-01	& P	1.255E+00	3.83E-01	G
PB-214	4.3493E-01						
		351.99	4.137E-01	(P	1.218E-01	4.54E-02	G K
		295.22	4.759E-01	(	1.945E-01	6.86E-02	G
							Energy duplication
		77.11	1.021E+00	+	9.921E-01	3.07E-01	G
		241.92	1.710E-01	%	7.385E-01	2.21E-01	G
BI-212	1.7728E-03						
		727.17	1.773E-03	&(	3.632E-01	1.00E-01	G K
		1620.56	-3.605E-02	% P	1.763E+00	4.38E-01	G
		785.42	5.936E-01	& P	2.743E+00	7.97E-01	G
BI-214	4.8060E-01						
		609.32	4.597E-01	(	1.134E-01	5.55E-02	G K
		1764.51	-1.733E-03	% P	4.507E-01	1.20E-01	G
		1120.28	5.446E-01	&(	4.362E-01	1.49E-01	G
RA-224	7.4024E+00						
		241.00	7.402E+00	&(P	1.007E+00	4.30E-01	G
RA-226	9.9401E-01						
		185.99	9.940E-01	(P	1.301E+00	4.00E-01	G
AC-228	2.0718E-01						
		911.07	1.342E-02	%(P	2.075E-01	5.85E-02	G K
		968.90	8.977E-04	% P	3.563E-01	9.92E-02	G
		338.40	6.751E-01	(	3.514E-01	1.20E-01	G
TH-227	-2.9787E-01						
		236.00	-2.979E-01	%(P	5.288E-01	1.61E-01	G K
		256.25	2.522E-02	&	5.572E-01	1.63E-01	G
PA-234	-2.3954E-02						
		98.44	-2.395E-02	%(	2.511E-01	7.49E-02	G K
		946.00	-2.427E-03	%	2.121E-01	5.69E-02	G
		131.28	-7.517E-02	%	2.487E-01	7.48E-02	G
		94.67	-1.365E-01	&	4.803E-01	1.45E-01	G
		883.24	8.660E-02	%	4.090E-01	1.18E-01	G
		926.70	1.430E-01	%	4.816E-01	1.41E-01	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26 1.026E-01 %   3.730E-01 1.09E-01 G

TH-234       6.0684E-01
                           63.29 6.068E-01 %(P 4.752E+00 1.42E+00 G K
                           92.80 1.647E+00 %   2.460E+00 7.52E-01 G
                           92.38 1.782E-01 & P 2.738E+00 8.16E-01 G

AM-241       4.8769E-03
                           59.54 4.877E-03 %(  6.971E-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

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
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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	5.7379E-02	6.0680E-02	3.4503E-01	3.4505E-01	3.760E-01
K-40		1.3150E+01	1.3150E+01	1.8133E+00	1.9577E+00	6.697E-01
MN-54	#A	1.2817E-02	1.2940E-02	4.5020E-02	4.5026E-02	5.114E-02
CO-57	#B	-4.6118E-03	-4.6632E-03	5.0043E-02	5.0044E-02	5.547E-02
CO-60	#B	2.3539E-03	2.3576E-03	5.5363E-02	5.5363E-02	6.700E-02

Sr-85	#	5.2058E-02	5.4513E-02	4.5610E-02	4.5713E-02	4.393E-02
Kr-85	#	1.2135E+03	1.2136E+03	1.0025E+03	1.0048E+03	1.008E+03
Y-88	#B	-2.1776E-05	-2.2395E-05	1.3437E-04	1.3437E-04	2.445E-02
NB-94	#B	5.8335E-04	5.8336E-04	3.1390E-02	3.1390E-02	3.902E-02
Ag-108M	#B	1.4579E-02	1.4580E-02	3.8712E-02	3.8720E-02	4.378E-02
CD-109	#A	-1.1914E-01	-1.1992E-01	3.0123E+00	3.0124E+00	2.283E+00
SN-113	#B	9.9300E-03	1.0191E-02	6.2149E-02	6.2152E-02	6.891E-02
SB-125	#B	6.7747E-02	6.7948E-02	7.0530E-02	7.0633E-02	1.566E-01
I-131	#B	-6.0613E-03	-8.7889E-03	5.6180E-02	5.6182E-02	4.436E-02
CS-134	#B	2.7402E-02	2.7511E-02	3.1697E-02	3.1734E-02	4.461E-02
CS-137	#A	-6.7770E-03	-6.7789E-03	5.3614E-02	5.3615E-02	6.220E-02
CE-139	#A	4.6884E-03	4.7914E-03	4.7193E-02	4.7194E-02	5.188E-02
EU-152	#B	-3.3325E-02	-3.3347E-02	1.6371E-01	1.6372E-01	1.691E-01
EU-154	#B	-1.1217E-02	-1.1228E-02	1.1633E-01	1.1633E-01	1.252E-01
EU-155	#B	1.3790E-01	1.3813E-01	2.3507E-01	2.3519E-01	2.576E-01
HG-203	#B	-1.0216E-02	-1.0893E-02	5.1360E-02	5.1363E-02	5.342E-02
TL-208	#	2.7083E-01	2.7083E-01	8.8444E-02	8.9741E-02	
PB-212	#	6.2909E-01	6.2909E-01	1.3014E-01	1.3484E-01	1.146E-01
PB-214	#	4.3493E-01	4.3493E-01	1.1825E-01	1.2074E-01	1.218E-01
BI-212	#B	1.7728E-03	1.7728E-03	3.0011E-01	3.0011E-01	3.632E-01
BI-214		4.8060E-01	4.8060E-01	1.7359E-01	1.7567E-01	
RA-224	#	7.4024E+00	7.4024E+00	1.2894E+00	1.3547E+00	1.007E+00
RA-226	#A	9.9401E-01	9.9401E-01	1.1994E+00	1.2007E+00	1.301E+00
AC-228	B	2.0718E-01	2.0718E-01	1.1020E-01	1.1082E-01	2.075E-01
TH-227	#B	-2.9787E-01	-2.9787E-01	4.8703E-01	4.8732E-01	5.288E-01
PA-234	#B	-2.3954E-02	-2.3954E-02	2.2468E-01	2.2468E-01	2.511E-01
TH-234	#B	6.0684E-01	6.0684E-01	4.2581E+00	4.2582E+00	4.752E+00
AM-241	#A	4.8769E-03	4.8769E-03	6.2097E-01	6.2097E-01	6.971E-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 1999.0 keV) 1.4108407E+01 pCi/gm
Total Decayed Activity (50.2 to 1999.0 keV) 1.4108407E+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_1AUG2006_1757.An1

Sample description
FSS-OOL-10-01-016-F

Spectrum Filename: C:\GammaVision\Spectra\102F_1AUG2006_1757.An1

Acquisition information
Start time: 01-Aug-2006 17:57:59
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: 1.9800E+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.

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	28-Jul-2006 08:45:00
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: 0.6726

***** 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	127.	35.13	1.50	8.847E-03				
74.91	127.	35.13	1.50	8.847E-03	74.81	9.600	PBC<MDA	PB212
77.24	198.	22.82	1.50	9.541E-03	77.11	10.700	1.322E+00	PB214
					77.11	17.500	8.083E-01	PB212
77.24	198.	22.82	1.50	9.541E-03	77.11	10.700	1.322E+00	PB214
					77.11	17.500	8.083E-01	PB212
93.09	125.	33.28	1.50	1.333E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	2.125E+00	TH234
93.09	124.	33.56	1.50	1.325E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
186.52	109.	34.75	1.74	1.624E-02	185.99	3.280	1.339E+00	RA226
209.88	75.	36.71	0.90	1.516E-02				
239.12	670.	4.60	1.22	1.378E-02	238.63	43.100	7.690E-01	PB212
241.82	98.	28.04	1.22	1.365E-02	241.00	3.900	PBC<MDA	RA224
					241.92	7.470	6.552E-01	PB214
270.52	61.	40.03	1.73	1.242E-02				
295.71	154.	14.60	1.22	1.145E-02	295.22	19.200	4.759E-01	PB214
301.05	61.	35.44	1.80	1.126E-02				
328.61	53.	38.69	0.58	1.035E-02				
338.85	158.	17.64	1.24	1.005E-02	338.40	12.010	8.948E-01	AC228
352.44	259.	11.71	1.29	9.666E-03	351.99	37.100	4.914E-01	PB214
463.81	72.	24.20	1.39	7.360E-03	463.51	10.000	6.502E-01	SB125
511.62	127.	15.76	1.89	6.683E-03	510.72	22.500	5.763E-01	TL208
					513.99	0.004	3.035E+03	Kr85
					514.00	99.270	1.378E-01	Sr85
584.27	226.	9.88	1.60	5.879E-03	583.14	86.000	3.033E-01	TL208
610.46	186.	10.17	1.79	5.639E-03	609.32	46.090	4.870E-01	BI214

728.56	54.	27.49	1.21	4.786E-03	727.17	11.800	6.563E-01	BI212
912.81	125.	10.60	1.41	3.915E-03				
970.63	117.	17.11	1.95	3.712E-03	968.90	17.460	1.230E+00	AC228
1463.45	540.	4.30	1.93	2.617E-03	1460.75	10.700	1.314E+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
372.64	186.52	458.	109.	0.055	104.24	1.741	PA-234 l
419.37	209.88	281.	75.	0.037	110.13	0.896	NP-239 M
477.87	239.25	141.	670.	0.335	13.81	1.215	PB-212 D
483.27	241.94	328.	98.	0.049	84.13	1.217	PB-214 D
540.69	270.52	199.	61.	0.031	120.08	1.731	AC-228 sM
601.76	301.05	155.	61.	0.030	106.32	1.799	PB-212 sM
656.90	328.61	147.	53.	0.026	116.07	0.585	RH-106M sM
1825.76	912.81	21.	125.	0.063	30.87	1.407	AC-228 M
1941.47	970.63	132.	51.	0.025	105.46	1.946	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-212	149.40	74.91	983.	127.	0.064	105.38	1.500s
PB-214	153.80	77.11	920.	198.	0.099	68.47	1.500D
PB-212	153.80	77.11	920.	198.	0.099	68.47	1.500D
TH-234	185.77	93.09	820.	124.	0.062	100.67	1.500s
TH-234	185.77	93.09	797.	125.	0.062	99.83	1.500s
PB-212	477.87	239.12	409.	619.	0.310	18.37	1.500
PB-214	591.32	295.83	166.	143.	0.072	45.68	1.500
AC-228	677.69	339.01	158.	117.	0.059	53.23	1.500
PB-214	704.77	352.55	156.	241.	0.121	29.15	1.500
SB-125	927.49	463.87	59.	38.	0.019	93.90	1.500
TL-208	1023.02	511.62	86.	127.	0.064	47.27	1.890s
TL-208	1168.38	584.27	78.	225.	0.113	29.65	1.602s
BI-214	1220.78	610.46	61.	186.	0.093	30.51	1.785s
Ag-108M	1224.51	612.33	189.	-58.	-0.029	108.53	1.499s
BI-212	1457.08	728.56	55.	54.	0.027	82.47	1.214
AC-228	1941.60	970.69	42.	66.	0.033	55.20	1.718
K-40	2927.79	1463.44	4.	505.	0.253	13.46	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		-1.0441E-02					
			477.56	-1.044E-02	&(	4.354E-01 1.24E-01	G
K-40		1.2299E+01					
			1460.75	1.230E+01	(P	3.064E-01 5.52E-01	G
MN-54		-1.1369E-02					
			834.81	-1.137E-02	%(P	5.817E-02 1.68E-02	G
CO-57		6.9842E-03					
			122.07	6.984E-03	%(	5.641E-02 1.68E-02	G K
			136.43	-6.246E-02	%	4.465E-01 1.33E-01	G
CO-60		5.7585E-03					
			1332.51	5.758E-03	%(P	5.535E-02 1.53E-02	G K
			1173.23	1.799E-02	&	6.174E-02 1.81E-02	G K
Sr-85		2.6517E-03					
			514.00	2.652E-03	&(	5.731E-02 1.66E-02	G
Kr-85		5.7217E+01					
			513.99	5.722E+01	&(	1.263E+03 3.66E+02	G
Y-88		6.1792E-03					
			1836.01	6.179E-03	%(P	5.723E-02 1.53E-02	G K
			898.02	-1.451E-02	% P	6.031E-02 1.74E-02	G
NB-94		3.1176E-03					
			871.10	3.118E-03	%(	3.527E-02 9.60E-03	G K
			702.50	-1.319E-03	&	5.191E-02 1.47E-02	G K
Ag-108M		6.8677E-03					
			722.95	6.868E-03	&(	4.479E-02 1.27E-02	G K
			614.37	-7.797E-02	& P	8.998E-02 2.81E-02	G
			433.93	5.931E-03	%	4.049E-02 1.17E-02	G
CD-109		1.2044E+00					
			88.04	1.204E+00	%(P	1.926E+00 5.87E-01	G
SN-113		-1.2336E-02					
			391.71	-1.234E-02	%(	6.264E-02 1.84E-02	G K
			255.04	4.915E-04	&	1.827E+00 5.33E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	6.3989E-02						
		427.95	-3.426E-02	%(P	1.488E-01	4.36E-02	G K
		600.77	-1.722E-02	& P	2.236E-01	6.33E-02	G
		636.15	4.541E-02	& P	4.105E-01	1.17E-01	G
		463.51	3.548E-01	(P	3.578E-01	1.16E-01	G
		176.29	-1.678E-02	& P	6.861E-01	2.02E-01	G
I-131	-2.1017E-02						
		364.48	-2.102E-02	%(	7.043E-02	2.10E-02	G K
		636.97	4.628E-02	&	8.724E-01	2.46E-01	G
		284.29	1.952E-02	%	7.520E-01	2.17E-01	G
CS-134	-1.3134E-03						
		604.66	-1.313E-03	%(	5.988E-02	1.72E-02	G K
		795.76	4.193E-02	&	5.688E-02	1.80E-02	G
		569.29	4.831E-03	%	3.074E-01	8.74E-02	G
		801.84	-5.044E-02	% P	6.431E-01	1.83E-01	G
CS-137	-1.2336E-03						
		661.62	-1.234E-03	&(	6.154E-02	1.75E-02	G
CE-139	-4.0267E-03						
		165.85	-4.027E-03	%(P	4.261E-02	1.26E-02	G
EU-152	2.7943E-03						
		121.78	2.794E-03	%(P	1.687E-01	5.01E-02	G K
		344.30	-5.137E-02	%	1.643E-01	4.91E-02	G
		1408.08	-5.546E-02	%	3.064E-01	8.71E-02	G
		964.00	2.538E-01	% P	3.538E-01	1.12E-01	G
		1112.07	5.447E-02	%	4.898E-01	1.39E-01	G
		778.90	-5.327E-02	% P	3.755E-01	1.07E-01	G
EU-154	-5.0738E-04						
		123.10	-5.074E-04	%(P	1.237E-01	3.67E-02	G K
		1274.80	-2.487E-02	%	2.062E-01	5.86E-02	G
		723.30	3.241E-02	& P	2.421E-01	6.92E-02	G
		1004.80	6.705E-02	%	2.849E-01	8.21E-02	G
EU-155	5.4061E-02						
		86.45	5.406E-02	&(P	2.151E-01	6.45E-02	G K
		105.31	9.189E-02	%	2.337E-01	7.06E-02	G
HG-203	1.6445E-03						
		279.17	1.644E-03	%(P	5.604E-02	1.64E-02	G K
		72.87	-6.013E-01	%	2.188E+00	6.59E-01	G
		70.83	1.481E+00	&	3.291E+00	9.97E-01	G
		82.50	-1.188E+00	%	3.910E+00	1.18E+00	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	3.0329E-01						
		583.14	3.033E-01	@(P	5.907E-02	3.01E-02	G
		510.72	5.763E-01	+	2.079E-01	9.10E-02	G
PB-212	7.3862E-01						
		238.63	7.103E-01	(	1.113E-01	4.35E-02	G K
							Energy duplication
		77.11	8.083E-01	@(	5.888E-01	1.84E-01	G
		74.81	1.021E+00	& P	1.196E+00	3.67E-01	G
PB-214	4.5364E-01						
		351.99	4.589E-01	(P	1.156E-01	4.47E-02	G K
		295.22	4.435E-01	(	1.944E-01	6.75E-02	G
							Energy duplication
		77.11	1.322E+00	+	9.629E-01	3.02E-01	G
		241.92	4.215E-01	%	6.881E-01	2.10E-01	G
BI-212	6.5632E-01						
		727.17	6.563E-01	(	4.481E-01	1.81E-01	G K
		1620.56	-3.488E-01	% P	2.150E+00	5.89E-01	G
		785.42	-2.714E-03	% P	3.102E+00	8.78E-01	G
BI-214	4.8702E-01						
		609.32	4.870E-01	(	1.027E-01	4.96E-02	G K
		1764.51	-1.670E-03	% P	1.420E-01	1.93E-02	G
		1120.28	3.943E-03	&	4.365E-01	1.21E-01	G
RA-224	9.1157E-01						
		241.00	9.116E-01	%(P	1.298E+00	3.98E-01	G
RA-226	7.6180E-01						
		185.99	7.618E-01	%(P	1.323E+00	4.02E-01	G
AC-228	3.4179E-01						
		911.07	-6.237E-03	%(P	1.901E-01	5.29E-02	G K
		968.90	6.985E-01	(P	3.445E-01	1.29E-01	G
		338.40	6.635E-01	(	3.467E-01	1.18E-01	G
TH-227	3.6015E-02						
		236.00	3.601E-02	%(P	6.022E-01	1.80E-01	G K
		256.25	-8.892E-04	%	5.106E-01	1.49E-01	G
PA-234	4.9830E-03						
		98.44	4.983E-03	%(	2.126E-01	6.30E-02	G K
		946.00	-7.484E-02	%	3.081E-01	8.99E-02	G
		131.28	-2.540E-02	&	2.487E-01	7.42E-02	G
		94.67	-2.020E-01	%	4.613E-01	1.40E-01	G
		883.24	-7.020E-03	&	3.866E-01	1.06E-01	G
		926.70	0.000E+00	%	6.225E-01	1.76E-01	G

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 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26 7.667E-03 %   4.541E-01 1.29E-01 G

TH-234       1.2557E+00
                           63.29-2.226E-01 %(P 4.424E+00 1.32E+00 G K
                           92.80 2.125E+00  (  2.291E+00 7.07E-01 G
                           92.38 2.484E+00  (P 2.728E+00 8.41E-01 G

AM-241      -3.0457E-02
                           59.54-3.046E-02 &(  6.630E-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	-9.8638E-03	-1.0441E-02	3.7341E-01	3.7342E-01	4.113E-01
K-40		1.2299E+01	1.2299E+01	1.6557E+00	1.7938E+00	3.064E-01
MN-54	#A	-1.1259E-02	-1.1369E-02	5.3642E-02	5.3646E-02	5.760E-02
CO-57	#B	6.9060E-03	6.9842E-03	5.0472E-02	5.0474E-02	5.578E-02
CO-60	#B	5.7494E-03	5.7585E-03	4.5784E-02	4.5785E-02	5.527E-02

Sr-85	#A	2.5303E-03	2.6517E-03	4.9763E-02	4.9763E-02	5.468E-02
Kr-85	#A	5.7215E+01	5.7217E+01	1.0966E+03	1.0966E+03	1.263E+03
Y-88	#B	6.0056E-03	6.1792E-03	4.6016E-02	4.6018E-02	5.563E-02
NB-94	#B	3.1176E-03	3.1176E-03	2.8811E-02	2.8812E-02	3.527E-02
Ag-108M	#B	6.8672E-03	6.8677E-03	3.8202E-02	3.8204E-02	4.478E-02
CD-109	#A	1.1964E+00	1.2044E+00	1.7624E+00	1.7636E+00	1.913E+00
SN-113	#B	-1.2015E-02	-1.2336E-02	5.5212E-02	5.5216E-02	6.101E-02
SB-125	#B	6.3797E-02	6.3989E-02	6.2518E-02	6.2621E-02	1.484E-01
I-131	#B	-1.4402E-02	-2.1017E-02	6.2887E-02	6.2898E-02	4.826E-02
CS-134	#B	-1.3081E-03	-1.3134E-03	5.1612E-02	5.1612E-02	5.964E-02
CS-137	#A	-1.2332E-03	-1.2336E-03	5.2387E-02	5.2387E-02	6.152E-02
CE-139	#A	-3.9387E-03	-4.0267E-03	4.2183E-02	4.2183E-02	4.168E-02
EU-152	#B	2.7925E-03	2.7943E-03	1.5023E-01	1.5023E-01	1.686E-01
EU-154	#B	-5.0688E-04	-5.0738E-04	2.6002E-01	2.6002E-01	1.236E-01
EU-155	#B	5.3970E-02	5.4061E-02	1.9344E-01	1.9346E-01	2.147E-01
HG-203	#B	1.5406E-03	1.6445E-03	4.9303E-02	4.9303E-02	5.250E-02
TL-208	#	3.0329E-01	3.0329E-01	9.0091E-02	9.1685E-02	
PB-212	#	7.3862E-01	7.3862E-01	1.3569E-01	1.4188E-01	1.113E-01
PB-214	#	4.5364E-01	4.5364E-01	1.2297E-01	1.2557E-01	1.156E-01
BI-212		6.5632E-01	6.5632E-01	5.4129E-01	5.4255E-01	
BI-214		4.8702E-01	4.8702E-01	1.4861E-01	1.5110E-01	
RA-224	#A	9.1157E-01	9.1157E-01	1.1945E+00	1.1956E+00	1.298E+00
RA-226	#A	7.6180E-01	7.6180E-01	1.2071E+00	1.2079E+00	1.323E+00
AC-228	F	3.4179E-01	3.4179E-01	1.8195E-01	1.8296E-01	1.901E-01
TH-227	#B	3.6015E-02	3.6015E-02	5.3873E-01	5.3874E-01	6.022E-01
PA-234	#B	4.9830E-03	4.9830E-03	1.8909E-01	1.8909E-01	2.126E-01
TH-234	#B	1.2557E+00	1.2557E+00	1.2535E+00	1.2554E+00	4.424E+00
AM-241	#A	-3.0457E-02	-3.0457E-02	5.9150E-01	5.9150E-01	6.630E-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 (270.2 to 1999.0 keV) 1.4087812E+01 pCi/gm
Total Decayed Activity (270.2 to 1999.0 keV) 1.4087812E+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_1AUG2006_1834.An1

Sample description
FSS-OOL-10-01-008-F

Spectrum Filename: C:\GammaVision\Spectra\102F_1AUG2006_1834.An1

Acquisition information
Start time: 01-Aug-2006 18:34:52
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: 1.9180E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.9180E+03) =
5.2138E+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	28-Jul-2006 08:20:00
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. 13 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.6844

***** 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
76.57	288.	16.73	0.95	9.381E-03				
76.57	288.	16.73	0.95	9.381E-03	77.11	10.700	1.988E+00	PB214
					77.11	17.500	1.215E+00	PB212
87.12	85.	35.58	1.11	1.215E-02	86.45	32.740	PBC<MDA	EU155
89.94	91.	30.16	1.11	1.276E-02	88.04	3.790	PBC<MDA	CD109
93.25	124.	24.06	1.11	1.342E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	2.182E+00	TH234
121.75	45.	31.04	0.48	1.681E-02				
121.75	45.	31.04	0.48	1.681E-02	121.78	29.240	PBC<MDA	EU152
					122.07	85.600	2.236E-02	CO57
186.62	113.	29.09	1.71	1.624E-02	185.99	3.280	1.433E+00	RA226
209.65	102.	33.41	1.97	1.518E-02				
239.11	669.	4.80	1.22	1.378E-02	238.63	43.100	7.927E-01	PB212
					241.00	3.900	8.814E+00	RA224
242.12	99.	23.24	1.22	1.364E-02	241.92	7.470	6.814E-01	PB214
271.22	79.	32.15	0.84	1.239E-02				
295.93	152.	11.76	1.26	1.144E-02	295.22	19.200	4.881E-01	PB214
300.36	48.	30.77	1.26	1.128E-02				
339.02	166.	16.75	1.61	1.004E-02	338.40	12.010	9.669E-01	AC228
352.59	260.	9.75	1.06	9.662E-03	351.99	37.100	5.098E-01	PB214
463.66	41.	30.82	1.50	7.365E-03	463.51	10.000	3.975E-01	SB125
511.56	120.	15.44	1.61	6.684E-03	510.72	22.500	5.594E-01	TL208
584.30	180.	9.98	1.26	5.879E-03	583.14	86.000	2.498E-01	TL208
610.47	169.	10.25	1.16	5.639E-03	609.32	46.090	4.584E-01	BI214
662.74	47.	35.56	0.78	5.221E-03	661.62	84.620	7.549E-02	CS137
727.81	76.	18.89	1.49	4.790E-03	727.17	11.800	9.466E-01	BI212
769.64	39.	34.69	0.74	4.554E-03				

912.58	161.	11.93	1.71	3.916E-03	911.07	29.000	9.984E-01	AC228
966.68	33.	27.86	1.72	3.725E-03				
966.68	33.	27.86	1.72	3.725E-03	968.90	17.460	3.630E-01	AC228
970.61	71.	15.42	1.72	3.712E-03				
1121.90	70.	19.35	1.73	3.279E-03	1120.28	15.040	9.960E-01	BI214
1463.43	552.	4.38	2.18	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	
173.81	87.15	416.	85.	0.043	106.73	1.107	PB-214	D
179.45	89.97	331.	91.	0.045	90.47	1.109	PB-214	D
186.09	93.28	382.	124.	0.062	72.19	1.112	U-235	D
418.91	209.65	380.	102.	0.051	100.22	1.966	NP-239	sM
477.86	239.14	182.	669.	0.335	14.40	1.215	PB-212	D
483.88	242.15	213.	99.	0.049	69.71	1.217	PB-214	D
542.09	271.22	208.	78.	0.039	84.97	0.841	PA-234	M
600.37	300.36	84.	48.	0.024	92.30	1.258	PB-212	lD
1825.30	912.58	159.	50.	0.025	115.35	1.706	AC-228	sM
1933.57	966.75	27.	33.	0.017	83.58	1.716	TB-160	D
1941.43	970.69	24.	71.	0.035	46.26	1.719	AC-228	D
2927.77	1463.43	9.	550.	0.275	12.99	2.184	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	1022.	191.	0.096	74.23	1.500D
PB-212	153.80	77.11	1022.	191.	0.096	74.23	1.500D
TH-234	185.98	93.20	867.	130.	0.065	99.66	1.500s
RA-226	372.67	186.53	468.	97.	0.049	94.61	1.500s
PB-212	477.87	239.12	490.	613.	0.306	19.54	1.500s
RA-224	477.86	239.11	352.	620.	0.310	17.56	1.500
PB-214	591.45	295.90	173.	149.	0.074	44.79	1.500
AC-228	677.71	339.02	156.	144.	0.072	44.57	1.500
PB-214	704.89	352.60	115.	256.	0.128	25.80	1.500
SB-125	927.06	463.66	68.	41.	0.021	92.47	1.500s
TL-208	1022.90	511.56	71.	120.	0.060	46.32	1.608s
TL-208	1168.44	584.30	57.	180.	0.090	29.93	1.264
BI-214	1220.79	610.47	46.	169.	0.085	30.76	1.161
CS-137	1326.05	663.07	47.	29.	0.014	115.03	1.509s
BI-212	1455.58	727.81	42.	76.	0.038	56.68	1.491s
AC-228	1825.63	912.74	44.	111.	0.056	37.90	1.679
BI-214	2244.89	1122.25	31.	52.	0.026	61.70	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		-8.9478E-02					
			477.56	-8.948E-02	&(	4.541E-01 1.33E-01	G
K-40		3.2644E-02					
			1460.75	3.264E-02	%(P	1.028E+00 2.92E-01	G
MN-54		3.1729E-03					
			834.81	3.173E-03	&(P	5.294E-02 1.48E-02	G
CO-57		-1.5997E-02					
			122.07	-1.600E-02	%(	6.263E-02 1.88E-02	G K
			136.43	6.008E-02	%	4.661E-01 1.39E-01	G
CO-60		-9.7858E-03					
			1332.51	-9.786E-03	%(P	6.219E-02 1.75E-02	G K
			1173.23	3.158E-02	&	7.274E-02 2.19E-02	G K
Sr-85		-1.5354E-02					
			514.00	-1.535E-02	%(	5.714E-02 1.69E-02	G
Kr-85		-3.3808E+02					
			513.99	-3.381E+02	%(	1.258E+03 3.73E+02	G
Y-88		-2.2295E-05					
			1836.01	-2.230E-05	%(P	5.717E-02 1.45E-02	G K
			898.02	1.876E-02	% P	4.691E-02 1.39E-02	G
NB-94		-2.3482E-03					
			871.10	-2.348E-03	&(	5.510E-02 1.54E-02	G K
			702.50	2.119E-02	%	4.461E-02 1.35E-02	G K
Ag-108M		-1.3123E-02					
			722.95	-1.312E-02	%(	5.899E-02 1.72E-02	G K
			614.37	-1.507E-02	% P	6.204E-02 1.82E-02	G
			433.93	-5.428E-03	&	4.456E-02 1.29E-02	G
CD-109		2.4653E-01					
			88.04	2.465E-01	&(P	2.214E+00 6.62E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SN-113	9.9226E-03						
		391.71	9.923E-03	%(	4.992E-02	1.45E-02	G K
		255.04	-1.355E-01	&	2.113E+00	6.22E-01	G
SB-125	9.9980E-02						
		427.95	-5.189E-04	%(P	1.490E-01	4.26E-02	G K
		600.77	7.623E-02	& P	1.761E-01	5.29E-02	G
		636.15	-7.667E-02	& P	4.549E-01	1.32E-01	G
		463.51	3.975E-01	(P	3.941E-01	1.27E-01	G
		176.29	3.887E-02	% P	7.191E-01	2.13E-01	G
I-131	1.8410E-02						
		364.48	1.841E-02	%(	7.086E-02	2.10E-02	G K
		636.97	-1.393E-01	&	9.440E-01	2.72E-01	G
		284.29	1.631E-01	%	9.640E-01	2.85E-01	G
CS-134	-8.2157E-03						
		604.66	-8.216E-03	%(	5.165E-02	1.50E-02	G K
		795.76	3.802E-02	%	5.445E-02	1.72E-02	G
		569.29	7.486E-02	&	2.761E-01	8.11E-02	G
		801.84	-7.144E-02	% P	5.852E-01	1.66E-01	G
CS-137	4.5955E-02						
		661.62	4.596E-02	@(	5.507E-02	1.76E-02	G
CE-139	8.6191E-03						
		165.85	8.619E-03	%(P	5.996E-02	1.79E-02	G
EU-152	-4.2721E-02						
		121.78	-4.272E-02	%(P	1.806E-01	5.41E-02	G K
		344.30	1.214E-03	&	1.469E-01	4.24E-02	G
		1408.08	3.589E-03	&	2.715E-01	7.26E-02	G
		964.00	-8.943E-02	% P	5.137E-01	1.49E-01	G
		1112.07	1.126E-01	%	4.271E-01	1.24E-01	G
		778.90	-8.160E-04	% P	4.257E-01	1.19E-01	G
EU-154	-3.1001E-02						
		123.10	-3.100E-02	%(P	1.309E-01	3.93E-02	G K
		1274.80	0.000E+00	&	2.209E-01	6.15E-02	G
		723.30	-6.397E-03	% P	2.548E-01	7.13E-02	G
		1004.80	-3.394E-02	&	4.020E-01	1.14E-01	G
EU-155	4.7612E-02						
		86.45	4.761E-02	&(P	2.786E-01	8.35E-02	G K
		105.31	3.762E-02	%	2.641E-01	7.89E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
HG-203	2.1621E-02						
		279.17	2.162E-02	%(P	5.055E-02	1.53E-02	G K
		72.87	-2.065E-01	%	2.319E+00	6.94E-01	G
		70.83	-8.652E-01	%	4.195E+00	1.26E+00	G
		82.50	-9.654E-01	&	4.689E+00	1.41E+00	G
TL-208	2.4980E-01						
		583.14	2.498E-01	(P	5.288E-02	2.50E-02	G
		510.72	5.594E-01	+	1.969E-01	8.65E-02	G
PB-212	7.4897E-01						
		238.63	7.257E-01	@(	1.254E-01	4.73E-02	G K
							Energy duplication
		77.11	8.062E-01	@(	6.400E-01	1.99E-01	G
		74.81	6.040E-01	& P	1.294E+00	3.92E-01	G
PB-214	4.9316E-01						
		351.99	5.016E-01	(P	1.033E-01	4.32E-02	G K
		295.22	4.768E-01	(	2.047E-01	7.12E-02	G
							Energy duplication
		77.11	1.318E+00	+	1.047E+00	3.26E-01	G
		241.92	3.531E-01	%	8.013E-01	2.43E-01	G
BI-212	9.4656E-01						
		727.17	9.466E-01	@(	4.099E-01	1.79E-01	G K
		1620.56	-3.153E-01	% P	1.988E+00	5.36E-01	G
		785.42	-2.802E-03	% P	2.986E+00	8.41E-01	G
BI-214	4.5839E-01						
		609.32	4.584E-01	(	9.248E-02	4.71E-02	G K
		1764.51	-1.724E-03	& P	4.484E-01	1.19E-01	G
		1120.28	7.420E-01	+	4.100E-01	1.53E-01	G
RA-224	8.1818E+00						
		241.00	8.182E+00	&(P	1.189E+00	4.80E-01	G
RA-226	1.2844E+00						
		185.99	1.284E+00	(P	1.367E+00	4.24E-01	G
AC-228	7.3295E-01						
		911.07	6.893E-01	(P	2.076E-01	8.73E-02	G K
		968.90	-1.972E-03	% P	2.458E-01	6.57E-02	G
		338.40	8.383E-01	(	3.555E-01	1.25E-01	G
TH-227	-2.5887E-01						
		236.00	-2.589E-01	%(P	5.427E-01	1.65E-01	G K
		256.25	1.681E-01	%	5.880E-01	1.76E-01	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments

PA-234       2.8127E-03
                           98.44 2.813E-03 %(  2.553E-01 7.59E-02 G K
                          946.00-3.219E-02 &   3.124E-01 8.89E-02 G
                          131.28-4.869E-02 %   2.623E-01 7.86E-02 G
                           94.67 1.799E-02 %   3.963E-01 1.18E-01 G
                          883.24-1.656E-02 &   4.456E-01 1.24E-01 G
                          926.70-1.891E-02 &   4.655E-01 1.29E-01 G
                          569.26 1.106E-01 &   4.079E-01 1.20E-01 G

TH-234       1.6322E+00
                           63.29 1.126E+00 %(P 4.827E+00 1.45E+00 G K
                           92.80 2.290E+00  (  2.465E+00 7.61E-01 G
                           92.38 1.519E-01 % P 2.972E+00 8.86E-01 G

AM-241      -9.8291E-02
                           59.54-9.829E-02 &(  6.829E-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	-8.4482E-02	-8.9478E-02	3.9882E-01	3.9886E-01	4.288E-01
K-40	A	3.2644E-02	3.2644E-02	8.7733E-01	8.7733E-01	1.028E+00
MN-54	#A	3.1419E-03	3.1729E-03	4.4532E-02	4.4532E-02	5.242E-02
CO-57	#B	-1.5816E-02	-1.5997E-02	5.6435E-02	5.6442E-02	6.192E-02
CO-60	#B	-9.7702E-03	-9.7858E-03	5.4601E-02	5.4604E-02	6.209E-02
Sr-85	#A	-1.4644E-02	-1.5354E-02	5.0809E-02	5.0817E-02	5.450E-02
Kr-85	#A	-3.3806E+02	-3.3808E+02	1.1188E+03	1.1189E+03	1.258E+03
Y-88	#B	-2.1662E-05	-2.2295E-05	5.7295E-04	5.7295E-04	5.554E-02
NB-94	#B	-2.3482E-03	-2.3482E-03	4.6297E-02	4.6297E-02	5.510E-02
Ag-108M	#B	-1.3122E-02	-1.3123E-02	5.1605E-02	5.1610E-02	5.899E-02
CD-109	#A	2.4487E-01	2.4653E-01	1.9856E+00	1.9857E+00	2.199E+00
SN-113	#B	9.6616E-03	9.9226E-03	4.3603E-02	4.3606E-02	4.861E-02
SB-125	#B	9.9677E-02	9.9980E-02	9.5908E-02	9.6072E-02	1.486E-01
I-131	#B	1.2569E-02	1.8410E-02	6.2979E-02	6.2988E-02	4.838E-02
CS-134	#B	-8.1823E-03	-8.2157E-03	4.4942E-02	4.4944E-02	5.144E-02
CS-137	#A	4.5942E-02	4.5955E-02	5.2860E-02	5.2923E-02	5.506E-02
CE-139	#A	8.4289E-03	8.6191E-03	5.3655E-02	5.3657E-02	5.863E-02
EU-152	#B	-4.2692E-02	-4.2721E-02	1.7228E-01	1.7229E-01	1.805E-01
EU-154	#B	-3.0970E-02	-3.1001E-02	1.1945E-01	1.1946E-01	1.308E-01
EU-155	#B	4.7532E-02	4.7612E-02	2.5055E-01	2.5056E-01	2.781E-01
HG-203	#B	2.0243E-02	2.1621E-02	4.5787E-02	4.5803E-02	4.733E-02
TL-208		2.4980E-01	2.4980E-01	7.4937E-02	7.6237E-02	
PB-212	#	7.4897E-01	7.4897E-01	1.4634E-01	1.5226E-01	1.254E-01
PB-214	#	4.9316E-01	4.9316E-01	1.2742E-01	1.3039E-01	1.033E-01
BI-212	#	9.4656E-01	9.4656E-01	5.3654E-01	5.3916E-01	
BI-214		4.5839E-01	4.5839E-01	1.4099E-01	1.4332E-01	
RA-224	#	8.1818E+00	8.1818E+00	1.4393E+00	1.5107E+00	1.189E+00
RA-226	#A	1.2844E+00	1.2844E+00	1.2709E+00	1.2729E+00	1.367E+00
AC-228		7.3295E-01	7.3295E-01	2.1460E-01	2.1850E-01	2.076E-01
TH-227	#B	-2.5887E-01	-2.5887E-01	4.9852E-01	4.9873E-01	5.427E-01
PA-234	#B	2.8127E-03	2.8127E-03	2.2770E-01	2.2770E-01	2.553E-01
TH-234	#B	1.6322E+00	1.6322E+00	1.6266E+00	1.6292E+00	4.827E+00
AM-241	#A	-9.8289E-02	-9.8291E-02	6.1195E-01	6.1198E-01	6.829E-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 (1121.8 to 1999.0 keV) 2.3876991E+00 pCi/gm
Total Decayed Activity (1121.8 to 1999.0 keV) 2.3876991E+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_1AUG2006_1931.An1

Sample description
FSS-OOL-10-01-019-F

Spectrum Filename: C:\GammaVision\Spectra\102F_1AUG2006_1931.An1

Acquisition information
Start time: 01-Aug-2006 19:31:12
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: 1.9390E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.9390E+03) =
5.1573E+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	28-Jul-2006 09:20:00
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: 0.6999

***** 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
75.08	131.	26.25	1.10	9.089E-03	74.81	9.600	PBC<MDA	PB212
77.18	225.	13.79	1.10	9.713E-03	77.11	10.700	1.536E+00	PB214
					77.11	17.500	9.393E-01	PB212
186.27	100.	26.69	0.81	1.625E-02	185.99	3.280	PBC<MDA	RA226
239.36	750.	6.25	1.01	1.377E-02	238.63	43.100	8.791E-01	PB212
295.80	119.	14.08	1.26	1.145E-02	295.22	19.200	3.763E-01	PB214
300.83	40.	35.04	1.26	1.127E-02				
339.16	147.	16.87	1.08	1.004E-02	338.40	12.010	8.480E-01	AC228
352.69	225.	11.15	1.45	9.660E-03	351.99	37.100	4.356E-01	PB214
463.27	40.	36.82	1.28	7.369E-03				
463.27	40.	36.82	1.28	7.369E-03	463.51	10.000	PBC<MDA	SB125
511.32	109.	18.13	2.05	6.687E-03	510.72	22.500	5.038E-01	TL208
584.25	208.	10.11	1.53	5.879E-03	583.14	86.000	2.863E-01	TL208
610.50	170.	11.37	1.61	5.639E-03	609.32	46.090	4.556E-01	BI214
798.39	47.	22.62	1.49	4.407E-03	795.76	85.400	8.714E-02	CS134
912.89	116.	11.10	1.58	3.915E-03	911.07	29.000	7.063E-01	AC228
1122.05	44.	26.62	1.51	3.279E-03	1120.28	15.040	6.154E-01	BI214
1463.41	456.	4.96	1.81	2.617E-03	1460.75	10.700	1.132E+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	
149.73	75.60	527.	131.	0.066	78.75	1.099	PB-214	D
153.93	77.70	369.	225.	0.113	41.37	1.100	PB-214	D
478.35	239.36	918.	224.	0.112	60.83	1.014	PB-212	M

601.08	300.71	84.	39.	0.020	110.67	1.051	PB-212	M

Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM	Suspected	
926.29	463.27	69.	40.	0.020	110.46	1.282	SB-125	l
1596.79	798.39	37.	32.	0.016	96.02	1.495	PA-234	sM
2244.50	1122.05	28.	45.	0.022	67.07	1.513	TA-182	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	876.	190.	0.095	69.44	1.500D
PB-212	153.80	77.11	876.	190.	0.095	69.44	1.500D
RA-226	372.34	186.37	416.	92.	0.046	94.52	1.500s
PB-212	477.86	239.11	434.	468.	0.234	23.42	1.500
PB-214	591.59	295.97	143.	120.	0.060	50.27	1.500
AC-228	677.77	339.05	123.	147.	0.074	40.46	1.500
PB-214	705.05	352.68	107.	209.	0.104	29.45	1.500
TL-208	1022.43	511.32	85.	109.	0.054	54.38	2.049s
TL-208	1168.32	584.25	68.	208.	0.104	30.34	1.534
BI-214	1220.86	610.50	64.	170.	0.085	34.10	1.607
AC-228	1826.04	912.95	20.	114.	0.057	32.65	1.679
K-40	2927.89	1463.49	13.	426.	0.213	14.94	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		-7.4717E-02					
			477.56	-7.472E-02	%(	4.492E-01 1.31E-01	G
K-40		1.0595E+01					
			1460.75	1.060E+01	(P	4.784E-01 5.28E-01	G
MN-54		2.2349E-02					
			834.81	2.235E-02	%(P	5.123E-02 1.54E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CO-57	5.3568E-03						
		122.07	5.357E-03	%(	5.419E-02	1.61E-02	G K
		136.43	-1.225E-02	%	4.555E-01	1.35E-01	G
CO-60	6.1632E-04						
		1332.51	6.163E-04	%(P	5.793E-02	1.56E-02	G K
		1173.23	-1.374E-02	%	8.960E-02	2.60E-02	G K
Sr-85	-1.7153E-02						
		514.00	-1.715E-02	%(	5.976E-02	1.78E-02	G
Kr-85	-3.7771E+02						
		513.99	-3.777E+02	%(	1.316E+03	3.91E+02	G
Y-88	-2.2053E-05						
		1836.01	-2.205E-05	%(P	5.655E-02	1.44E-02	G K
		898.02	1.187E-02	% P	5.362E-02	1.54E-02	G
NB-94	1.2631E-02						
		871.10	1.263E-02	&(	4.932E-02	1.43E-02	G K
		702.50	5.327E-04	&	4.377E-02	1.22E-02	G K
Ag-108M	1.7598E-03						
		722.95	1.760E-03	%(	5.035E-02	1.41E-02	G K
		614.37	-4.430E-02	% P	7.959E-02	2.43E-02	G
		433.93	-8.474E-03	&	4.625E-02	1.35E-02	G
CD-109	8.8729E-01						
		88.04	8.873E-01	%(P	2.072E+00	6.27E-01	G
SN-113	2.1270E-03						
		391.71	2.127E-03	&(	6.318E-02	1.82E-02	G K
		255.04	1.538E-02	%	1.886E+00	5.51E-01	G
SB-125	1.7754E-02						
		427.95	1.775E-02	%(P	1.333E-01	3.86E-02	G K
		600.77	5.397E-02	% P	2.139E-01	6.24E-02	G
		636.15	5.909E-03	% P	3.638E-01	1.01E-01	G
		463.51	2.799E-01	% P	4.364E-01	1.34E-01	G
		176.29	-1.020E-01	% P	6.516E-01	1.93E-01	G
I-131	6.5904E-04						
		364.48	6.590E-04	&(	6.789E-02	1.95E-02	G K
		636.97	-1.567E-01	&	9.009E-01	2.60E-01	G
		284.29	-2.923E-01	%	8.644E-01	2.59E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CS-134	1.0632E-02						
		604.66	1.063E-02	&(	4.401E-02	1.29E-02	G K
		795.76	3.020E-02	%	5.851E-02	1.79E-02	G
		569.29	-1.152E-03	%	2.131E-01	5.86E-02	G
		801.84	-2.708E-02	% P	5.587E-01	1.56E-01	G
CS-137	-1.6879E-03						
		661.62	-1.688E-03	%(	6.749E-02	1.93E-02	G
CE-139	-1.3675E-02						
		165.85	-1.368E-02	%(P	5.620E-02	1.68E-02	G
EU-152	-1.2443E-03						
		121.78	-1.244E-03	%(P	1.732E-01	5.14E-02	G K
		344.30	1.832E-02	&	1.410E-01	4.12E-02	G
		1408.08	-5.109E-02	%	2.787E-01	7.86E-02	G
		964.00	1.482E-01	% P	3.819E-01	1.14E-01	G
		1112.07	-2.002E-02	%	4.914E-01	1.37E-01	G
		778.90	-3.404E-02	& P	4.013E-01	1.14E-01	G
EU-154	1.3028E-02						
		123.10	1.303E-02	%(P	1.164E-01	3.47E-02	G K
		1274.80	0.000E+00	&	1.635E-01	4.41E-02	G
		723.30	-1.978E-03	% P	1.648E-01	4.37E-02	G
		1004.80	-5.060E-02	%	3.410E-01	9.73E-02	G
EU-155	-7.4644E-02						
		86.45	-7.464E-02	&(P	2.568E-01	7.71E-02	G K
		105.31	2.371E-02	%	2.398E-01	7.14E-02	G
HG-203	1.0212E-02						
		279.17	1.021E-02	%(P	5.105E-02	1.51E-02	G K
		72.87	-7.387E-02	%	1.980E+00	5.90E-01	G
		70.83	-1.024E+00	&	4.166E+00	1.25E+00	G
		82.50	3.991E-01	%	4.138E+00	1.24E+00	G
TL-208	2.8631E-01						
		583.14	2.863E-01	(P	5.656E-02	2.91E-02	G
		510.72	5.038E-01	+	2.114E-01	9.15E-02	G
PB-212	5.4847E-01						
		238.63	5.485E-01	(	1.169E-01	4.28E-02	G K
							Energy duplication
		77.11	7.946E-01	+	5.869E-01	1.84E-01	G
		74.81	8.069E-01	& P	1.221E+00	3.72E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
PB-214	3.9688E-01						
		351.99	4.051E-01	(P	9.862E-02	3.98E-02	G K
		295.22	3.811E-01	(	1.852E-01	6.39E-02	G
							Energy duplication
		77.11	1.300E+00	+	9.599E-01	3.01E-01	G
		241.92	3.791E-01	%	7.194E-01	2.19E-01	G
BI-212	-3.5351E-02						
		727.17	-3.535E-02	&(	2.652E-01	7.34E-02	G K
		1620.56	-3.884E-02	% P	1.869E+00	4.73E-01	G
		785.42	-5.383E-01	% P	2.575E+00	7.46E-01	G
BI-214	4.5556E-01						
		609.32	4.556E-01	(	1.069E-01	5.19E-02	G K
		1764.51	-1.705E-03	% P	4.435E-01	1.18E-01	G
		1120.28	-1.920E-02	%	4.809E-01	1.35E-01	G
RA-224	7.4719E-01						
		241.00	7.472E-01	&(P	1.390E+00	4.23E-01	G
RA-226	1.1984E+00						
		185.99	1.198E+00	(P	1.277E+00	3.96E-01	G
AC-228	7.4118E-01						
		911.07	6.965E-01	(P	1.447E-01	7.60E-02	G K
		968.90	-1.198E-02	% P	4.115E-01	1.17E-01	G
		338.40	8.490E-01	(	3.143E-01	1.15E-01	G
TH-227	-2.0078E-01						
		236.00	-2.008E-01	%(P	5.028E-01	1.52E-01	G K
		256.25	-1.794E-01	%	6.130E-01	1.83E-01	G
PA-234	1.1602E-02						
		98.44	1.160E-02	%(	2.457E-01	7.31E-02	G K
		946.00	2.872E-02	%	2.650E-01	7.47E-02	G
		131.28	-2.341E-04	%	2.290E-01	6.78E-02	G
		94.67	-1.186E-01	%	4.710E-01	1.42E-01	G
		883.24	1.021E-01	%	3.444E-01	1.00E-01	G
		926.70	7.841E-04	%	4.413E-01	1.20E-01	G
		569.26	-1.190E-03	%	2.918E-01	7.95E-02	G
TH-234	1.4514E+00						
		63.29	1.451E+00	%(P	4.369E+00	1.32E+00	G K
		92.80	1.180E+00	%	2.452E+00	7.44E-01	G
		92.38	6.275E-01	& P	2.694E+00	8.08E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
AM-241	-9.6580E-02						
		59.54	-9.658E-02	&(	6.755E-01	2.02E-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:
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	-7.0546E-02	-7.4717E-02	3.9289E-01	3.9291E-01	4.241E-01
K-40		1.0595E+01	1.0595E+01	1.5840E+00	1.6919E+00	4.784E-01
MN-54	#A	2.2131E-02	2.2349E-02	4.6251E-02	4.6268E-02	5.073E-02
CO-57	#B	5.2963E-03	5.3568E-03	4.8370E-02	4.8371E-02	5.357E-02
CO-60	#B	6.1534E-04	6.1632E-04	4.6762E-02	4.6762E-02	5.784E-02
Sr-85	#A	-1.6361E-02	-1.7153E-02	5.3302E-02	5.3310E-02	5.700E-02
Kr-85	#A	-3.7770E+02	-3.7771E+02	1.1737E+03	1.1739E+03	1.316E+03
Y-88	#B	-2.1428E-05	-2.2053E-05	5.6674E-04	5.6674E-04	5.494E-02
NB-94	#B	1.2631E-02	1.2631E-02	4.3007E-02	4.3013E-02	4.932E-02
Ag-108M	#B	1.7597E-03	1.7598E-03	4.2195E-02	4.2195E-02	5.034E-02
CD-109	#A	8.8131E-01	8.8729E-01	1.8809E+00	1.8815E+00	2.058E+00

SN-113	#B	2.0711E-03	2.1270E-03	5.4585E-02	5.4585E-02	6.152E-02
SB-125	#B	1.7700E-02	1.7754E-02	1.1577E-01	1.1578E-01	1.329E-01
I-131	#B	4.5004E-04	6.5904E-04	5.8566E-02	5.8566E-02	4.636E-02
CS-134	#B	1.0589E-02	1.0632E-02	3.8553E-02	3.8557E-02	4.383E-02
CS-137	#A	-1.6875E-03	-1.6879E-03	5.7763E-02	5.7763E-02	6.747E-02
CE-139	#A	-1.3373E-02	-1.3675E-02	5.2201E-02	5.2206E-02	5.496E-02
EU-152	#B	-1.2435E-03	-1.2443E-03	2.7022E-01	2.7022E-01	1.731E-01
EU-154	#B	1.3015E-02	1.3028E-02	1.0406E-01	1.0406E-01	1.163E-01
EU-155	#B	-7.4518E-02	-7.4644E-02	2.7753E-01	2.7756E-01	2.563E-01
HG-203	#B	9.5617E-03	1.0212E-02	4.5381E-02	4.5384E-02	4.780E-02
TL-208		2.8631E-01	2.8631E-01	8.7048E-02	8.8518E-02	
PB-212	#	5.4847E-01	5.4847E-01	1.2843E-01	1.3207E-01	1.169E-01
PB-214	#	3.9688E-01	3.9688E-01	1.1568E-01	1.1780E-01	9.862E-02
BI-212	#B	-3.5351E-02	-3.5351E-02	2.2011E-01	2.2012E-01	2.652E-01
BI-214		4.5556E-01	4.5556E-01	1.5537E-01	1.5746E-01	
RA-224	#A	7.4719E-01	7.4719E-01	1.2679E+00	1.2686E+00	1.390E+00
RA-226	#A	1.1984E+00	1.1984E+00	1.1878E+00	1.1897E+00	1.277E+00
AC-228		7.4118E-01	7.4118E-01	1.9283E-01	1.9726E-01	1.447E-01
TH-227	#B	-2.0078E-01	-2.0078E-01	4.6134E-01	4.6148E-01	5.028E-01
PA-234	#B	1.1602E-02	1.1602E-02	2.1936E-01	2.1936E-01	2.457E-01
TH-234	#B	1.4514E+00	1.4514E+00	3.9481E+00	3.9490E+00	4.369E+00
AM-241	#A	-9.6578E-02	-9.6580E-02	6.0531E-01	6.0534E-01	6.755E-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 (1121.8 to 1999.0 keV) 1.2078237E+01 pCi/gm
Total Decayed Activity (1121.8 to 1999.0 keV) 1.2078237E+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_1AUG2006_2008.An1

Sample description
FSS-OOL-10-01-009-F

Spectrum Filename: C:\GammaVision\Spectra\102F_1AUG2006_2008.An1

Acquisition information
Start time: 01-Aug-2006 20:09:01
Live time: 2000
Real time: 2022
Dead time: 1.08 %
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: 2.1690E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 2.1690E+03) =
4.6104E+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	28-Jul-2006 07:49:00
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: 0.8291

***** 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	131.	36.15	1.50	8.847E-03				
74.78	131.	36.15	1.50	8.847E-03	74.81	9.600	PBC<MDA	PB212
77.24	196.	24.24	1.50	9.541E-03	77.11	10.700	1.198E+00	PB214
					77.11	17.500	7.326E-01	PB212
77.24	196.	24.24	1.50	9.541E-03	77.11	10.700	1.198E+00	PB214
					77.11	17.500	7.326E-01	PB212
93.03	96.	40.14	1.50	1.368E-02	92.80	3.000	1.498E+00	TH234
					94.67	15.500	2.825E-01	PA234
210.20	84.	36.76	0.97	1.515E-02				
239.18	714.	4.54	1.22	1.378E-02	238.63	43.100	7.475E-01	PB212
					241.00	3.900	8.313E+00	RA224
242.66	87.	23.95	1.22	1.362E-02	241.92	7.470	5.340E-01	PB214
271.26	83.	31.41	0.97	1.239E-02				
295.88	144.	12.90	1.26	1.144E-02	295.22	19.200	4.079E-01	PB214
300.84	47.	34.65	1.26	1.126E-02				
328.87	52.	32.24	1.03	1.034E-02				
339.34	167.	15.99	1.22	1.003E-02	338.40	12.010	8.632E-01	AC228
352.34	241.	9.49	1.48	9.669E-03	351.99	37.100	4.178E-01	PB214
464.28	39.	35.25	1.50	7.365E-03	463.51	10.000	PBC<MDA	SB125
511.80	95.	22.69	1.26	6.681E-03	510.72	22.500	3.946E-01	TL208
584.28	230.	9.12	1.64	5.879E-03	583.14	86.000	2.821E-01	TL208
610.52	202.	9.51	1.35	5.639E-03	609.32	46.090	4.824E-01	BI214
728.18	79.	20.14	2.56	4.788E-03	727.17	11.800	8.712E-01	BI212
912.76	147.	10.29	1.82	3.916E-03				
970.35	93.	17.28	1.35	3.713E-03	968.90	17.460	8.961E-01	AC228
1463.42	610.	4.13	1.99	2.617E-03	1460.75	10.700	1.354E+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	
420.02	210.20	344.	84.	0.042	110.29	0.970	TH-227	M
477.99	239.11	169.	714.	0.357	13.63	1.215	PB-212	D
484.95	242.59	176.	87.	0.044	71.86	1.218	XE-138	D
542.16	271.26	223.	83.	0.042	82.81	0.968	PA-234	sM
601.37	300.86	167.	53.	0.027	119.60	0.567	PB-212	sM
657.42	328.87	103.	52.	0.026	96.71	1.033	LA-140	M
1825.67	912.76	25.	153.	0.077	27.85	1.820	AC-228	M
2927.74	1463.42	6.	610.	0.305	12.25	1.995	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	149.13	74.78	1114.	131.	0.066	108.45	1.500s
PB-214	153.80	77.11	1034.	196.	0.098	72.71	1.500D
PB-212	153.80	77.11	1034.	196.	0.098	72.71	1.500D
PA-234	185.63	93.03	697.	96.	0.048	120.42	1.500s
PB-212	477.82	239.10	477.	635.	0.318	18.82	1.500
RA-224	477.84	239.11	295.	656.	0.328	16.11	1.500s
PB-214	591.36	295.85	179.	152.	0.076	44.51	1.500
AC-228	677.76	339.04	136.	133.	0.066	45.53	1.500
PB-214	704.81	352.57	133.	223.	0.111	29.72	1.500s
SB-125	928.30	464.28	83.	39.	0.019	105.74	1.500s
TL-208	1023.39	511.80	117.	95.	0.048	68.07	1.258s
TL-208	1168.39	584.28	73.	229.	0.115	27.36	1.642s
BI-214	1220.90	610.52	59.	202.	0.101	28.54	1.351
BI-212	1457.68	728.86	34.	60.	0.030	56.74	1.554
AC-228	1941.41	970.60	47.	61.	0.031	60.75	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		2.7053E-03					
			477.56	2.705E-03	&(	4.549E-01 1.31E-01	G
K-40		-1.8581E-02					
			1460.75	-1.858E-02	%(P	7.475E-01 2.09E-01	G
MN-54		1.4494E-02					
			834.81	1.449E-02	&(P	3.806E-02 1.13E-02	G
CO-57		7.7688E-03					
			122.07	7.769E-03	%(	5.328E-02 1.59E-02	G K
			136.43	-1.041E-01	%	4.427E-01 1.33E-01	G
CO-60		8.3678E-03					
			1332.51	8.368E-03	%(P	5.499E-02 1.55E-02	G K
			1173.23	8.611E-03	&	7.604E-02 2.18E-02	G K
Sr-85		-1.1089E-02					
			514.00	-1.109E-02	&(	6.029E-02 1.78E-02	G
Kr-85		-2.4359E+02					
			513.99	-2.436E+02	&(	1.326E+03 3.91E+02	G
Y-88		-1.9726E-05					
			1836.01	-1.973E-05	%(P	8.163E-02 2.23E-02	G K
			898.02	-1.402E-02	% P	6.550E-02 1.90E-02	G
NB-94		9.7233E-03					
			871.10	9.723E-03	%(	3.614E-02 1.04E-02	G K
			702.50	1.665E-02	%	4.438E-02 1.32E-02	G K
Ag-108M		-1.4783E-03					
			722.95	-1.478E-03	%(	4.354E-02 1.21E-02	G K
			614.37	-2.103E-02	& P	6.577E-02 1.96E-02	G
			433.93	9.676E-03	&	3.688E-02 1.09E-02	G
CD-109		1.3105E+00					
			88.04	1.311E+00	%(P	1.942E+00 5.93E-01	G
SN-113		-1.1470E-02					
			391.71	-1.147E-02	%(	6.796E-02 2.00E-02	G K
			255.04	-3.029E-01	%	1.908E+00 5.66E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	9.4964E-02						
		427.95	1.574E-02	%(P	1.384E-01	4.03E-02	G K
		600.77	-5.094E-02	% P	2.049E-01	5.98E-02	G
		636.15	1.025E-02	& P	4.674E-01	1.34E-01	G
		463.51	3.295E-01	(P	3.824E-01	1.21E-01	G
		176.29	-5.553E-02	% P	6.677E-01	1.98E-01	G
I-131	1.2883E-03						
		364.48	1.288E-03	&(	7.986E-02	2.33E-02	G K
		636.97	-2.046E-01	%	1.023E+00	2.99E-01	G
		284.29	-1.185E-01	%	8.973E-01	2.65E-01	G
CS-134	8.1081E-03						
		604.66	8.108E-03	%(	4.281E-02	1.24E-02	G K
		795.76	2.844E-02	%	6.145E-02	1.86E-02	G
		569.29	3.183E-03	%	2.856E-01	8.13E-02	G
		801.84	-1.025E-01	% P	5.848E-01	1.69E-01	G
CS-137	1.5701E-02						
		661.62	1.570E-02	&(	5.406E-02	1.60E-02	G
CE-139	1.3043E-02						
		165.85	1.304E-02	%(P	5.219E-02	1.56E-02	G
EU-152	1.4577E-02						
		121.78	1.458E-02	%(P	1.563E-01	4.66E-02	G K
		344.30	4.471E-02	%	1.404E-01	4.20E-02	G
		1408.08	-7.540E-03	&	2.531E-01	6.85E-02	G
		964.00	-1.211E-01	& P	5.207E-01	1.53E-01	G
		1112.07	7.015E-03	&	4.521E-01	1.26E-01	G
		778.90	3.998E-02	% P	3.039E-01	8.59E-02	G
EU-154	1.4959E-02						
		123.10	1.496E-02	%(P	1.156E-01	3.45E-02	G K
		1274.80	5.506E-02	%	1.551E-01	4.59E-02	G
		723.30	-6.017E-02	% P	2.676E-01	7.82E-02	G
		1004.80	1.025E-01	%	2.949E-01	8.74E-02	G
EU-155	-3.4132E-03						
		86.45	-3.413E-03	%(P	2.470E-01	7.36E-02	G K
		105.31	5.463E-02	&	2.314E-01	6.94E-02	G
HG-203	2.1022E-02						
		279.17	2.102E-02	%(P	4.726E-02	1.43E-02	G K
		72.87	-4.329E-01	%	2.132E+00	6.41E-01	G
		70.83	-5.293E-01	&	3.885E+00	1.16E+00	G
		82.50	-9.874E-02	%	4.106E+00	1.23E+00	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	2.8215E-01						
		583.14	2.821E-01	@(P	5.217E-02	2.58E-02	G
		510.72	3.946E-01	+	2.193E-01	8.97E-02	G
PB-212	6.8481E-01						
		238.63	6.654E-01	(	1.094E-01	4.17E-02	G K
							Energy duplication
		77.11	7.326E-01	(	5.692E-01	1.78E-01	G
		74.81	9.626E-01	& P	1.161E+00	3.56E-01	G
PB-214	4.0198E-01						
		351.99	3.868E-01	@(P	9.810E-02	3.84E-02	G K
		295.22	4.314E-01	(	1.844E-01	6.40E-02	G
							Energy duplication
		77.11	1.198E+00	+	9.310E-01	2.90E-01	G
		241.92	1.058E-01	%	6.714E-01	2.00E-01	G
BI-212	6.5792E-01						
		727.17	6.579E-01	(	3.289E-01	1.24E-01	G K
		1620.56	-4.521E-01	% P	2.081E+00	5.84E-01	G
		785.42	7.082E-01	% P	2.422E+00	7.13E-01	G
BI-214	4.8239E-01						
		609.32	4.824E-01	(	9.242E-02	4.60E-02	G K
		1764.51	-5.536E-02	% P	3.440E-01	9.48E-02	G
		1120.28	-7.359E-02	&	4.628E-01	1.34E-01	G
RA-224	7.6535E+00						
		241.00	7.653E+00	(P	9.659E-01	4.12E-01	G
RA-226	7.9664E-01						
		185.99	7.966E-01	%(P	1.274E+00	3.88E-01	G
AC-228	2.9948E-01						
		911.07	-3.429E-02	%(P	1.990E-01	5.74E-02	G K
		968.90	5.895E-01	(P	3.318E-01	1.19E-01	G
		338.40	6.839E-01	(	2.945E-01	1.04E-01	G
TH-227	-1.3896E-02						
		236.00	-1.390E-02	&(P	5.829E-01	1.74E-01	G K
		256.25	-1.821E-01	&	5.385E-01	1.62E-01	G
PA-234	1.0550E-01						
		98.44	-3.828E-03	%(	2.321E-01	6.91E-02	G K
		946.00	-2.307E-04	%	2.516E-01	6.96E-02	G
		131.28	4.984E-02	&	2.298E-01	6.89E-02	G
		94.67	2.825E-01	?(	3.694E-01	1.13E-01	G
		883.24	-1.115E-02	&	4.002E-01	1.12E-01	G
		926.70	5.130E-03	%	4.826E-01	1.35E-01	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26 1.829E-02 %   4.052E-01 1.16E-01 G

TH-234       4.3833E-01
                           63.29 4.383E-01 %(P 4.567E+00 1.36E+00 G K
                           92.80 1.532E+00 %   2.249E+00 6.87E-01 G
                           92.38-7.974E-01 & P 2.732E+00 8.22E-01 G

AM-241       1.4019E-02
                           59.54 1.402E-02 %(  5.702E-01 1.69E-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	2.5513E-03	2.7053E-03	3.9229E-01	3.9229E-01	4.290E-01
K-40	#A	-1.8581E-02	-1.8581E-02	9.0367E-01	9.0367E-01	7.475E-01
MN-54	#A	1.4349E-02	1.4494E-02	3.3904E-02	3.3914E-02	3.768E-02
CO-57	#B	7.6793E-03	7.7688E-03	4.7752E-02	4.7754E-02	5.267E-02
CO-60	#B	8.3542E-03	8.3678E-03	4.6412E-02	4.6415E-02	5.490E-02

Sr-85	#A	-1.0566E-02	-1.1089E-02	5.3383E-02	5.3387E-02	5.745E-02
Kr-85	#A	-2.4358E+02	-2.4359E+02	1.1743E+03	1.1744E+03	1.326E+03
Y-88	#B	-1.9156E-05	-1.9726E-05	8.7804E-04	8.7804E-04	7.927E-02
NB-94	#B	9.7233E-03	9.7233E-03	3.1341E-02	3.1345E-02	3.614E-02
Ag-108M	#B	-1.4782E-03	-1.4783E-03	3.6378E-02	3.6378E-02	4.354E-02
CD-109	#A	1.3015E+00	1.3105E+00	1.7797E+00	1.7812E+00	1.929E+00
SN-113	#B	-1.1163E-02	-1.1470E-02	6.0037E-02	6.0040E-02	6.613E-02
SB-125	#B	9.4671E-02	9.4964E-02	1.0441E-01	1.0455E-01	1.380E-01
I-131	#B	8.7298E-04	1.2883E-03	6.9818E-02	6.9818E-02	5.411E-02
CS-134	#B	8.0744E-03	8.1081E-03	3.7317E-02	3.7320E-02	4.264E-02
CS-137	#A	1.5697E-02	1.5701E-02	4.7869E-02	4.7877E-02	5.404E-02
CE-139	#A	1.2750E-02	1.3043E-02	4.6945E-02	4.6951E-02	5.102E-02
EU-152	#B	1.4567E-02	1.4577E-02	1.3972E-01	1.3972E-01	1.562E-01
EU-154	#B	1.4944E-02	1.4959E-02	1.0360E-01	1.0361E-01	1.155E-01
EU-155	#B	-3.4073E-03	-3.4132E-03	7.8787E-01	7.8787E-01	2.466E-01
HG-203	#B	1.9656E-02	2.1022E-02	4.2877E-02	4.2893E-02	4.419E-02
TL-208	#	2.8215E-01	2.8215E-01	7.7329E-02	7.8933E-02	
PB-212	#	6.8481E-01	6.8481E-01	1.2886E-01	1.3447E-01	1.094E-01
PB-214	#	4.0198E-01	4.0198E-01	1.0763E-01	1.0997E-01	9.810E-02
BI-212		6.5792E-01	6.5792E-01	3.7330E-01	3.7512E-01	3.289E-01
BI-214		4.8239E-01	4.8239E-01	1.3769E-01	1.4033E-01	
RA-224	#	7.6535E+00	7.6535E+00	1.2351E+00	1.3077E+00	9.659E-01
RA-226	#A	7.9664E-01	7.9664E-01	1.1653E+00	1.1662E+00	1.274E+00
AC-228	F	2.9948E-01	2.9948E-01	1.3636E-01	1.3739E-01	1.990E-01
TH-227	#B	-1.3896E-02	-1.3896E-02	6.1436E-01	6.1436E-01	5.829E-01
PA-234	#B	1.0550E-01	1.0550E-01	1.2704E-01	1.2718E-01	2.321E-01
TH-234	#B	4.3833E-01	4.3833E-01	4.0926E+00	4.0927E+00	4.567E+00
AM-241	#A	1.4019E-02	1.4019E-02	5.0756E-01	5.0756E-01	5.702E-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 (271.2 to 1999.0 keV) 1.7219445E+00 pCi/gm
Total Decayed Activity (271.2 to 1999.0 keV) 1.7219445E+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_2AUG2006_1007.An1

Sample description
FSS-OOL-10-01-011-F

Spectrum Filename: C:\GammaVision\Spectra\102F_2AUG2006_1007.An1

Acquisition information
Start time: 02-Aug-2006 10:07:30
Live time: 2000
Real time: 2023
Dead time: 1.15 %
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: 2.3420E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 2.3420E+03) =
4.2699E+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	28-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: 0.6537

***** 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	127.	38.06	1.50	8.847E-03				
74.86	127.	38.06	1.50	8.847E-03	74.81	9.600	PBC<MDA	PB212
77.10	232.	21.07	1.50	9.541E-03	77.11	10.700	1.311E+00	PB214
					77.11	17.500	8.015E-01	PB212
77.10	232.	21.07	1.50	9.541E-03	77.11	10.700	1.311E+00	PB214
					77.11	17.500	8.015E-01	PB212
185.97	155.	24.35	1.10	1.627E-02				
185.97	155.	24.35	1.10	1.627E-02	185.99	3.280	1.632E+00	RA226
209.78	124.	20.49	1.10	1.517E-02				
239.12	713.	4.58	1.22	1.378E-02	238.63	43.100	6.914E-01	PB212
242.19	104.	21.39	1.22	1.364E-02	241.00	3.900	PBC<MDA	RA224
					241.92	7.470	5.900E-01	PB214
295.59	183.	15.54	1.11	1.145E-02	295.22	19.200	4.791E-01	PB214
338.95	150.	16.13	1.24	1.004E-02	338.40	12.010	7.145E-01	AC228
352.67	253.	12.15	1.11	9.660E-03	351.99	37.100	4.054E-01	PB214
511.77	92.	19.92	1.17	6.681E-03	510.72	22.500	3.520E-01	TL208
584.24	225.	8.67	1.27	5.879E-03	583.14	86.000	2.561E-01	TL208
610.51	194.	9.92	1.05	5.639E-03	609.32	46.090	4.299E-01	BI214
728.67	35.	37.73	1.55	4.794E-03	727.17	11.800	PBC<MDA	BI212
796.32	27.	37.45	1.60	4.420E-03	795.76	85.400	PBC<MDA	CS134
912.83	166.	10.06	1.20	3.915E-03	911.07	29.000	8.400E-01	AC228
970.06	105.	18.68	1.33	3.714E-03				
1463.39	709.	3.83	1.87	2.617E-03	1460.75	10.700	1.459E+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	
419.17	209.78	250.	124.	0.062	61.47	1.097	NP-239	M

Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM	Suspected	
477.86	239.13	176.	713.	0.356	13.73	1.215	PB-212	D
484.02	242.21	197.	104.	0.052	64.17	1.217	PB-214	D
1940.33	970.06	61.	103.	0.051	43.82	1.329	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	149.29	74.86	1171.	127.	0.064	114.18	1.500s
PB-214	153.80	77.11	1078.	232.	0.116	63.22	1.500D
PB-212	153.80	77.11	1078.	232.	0.116	63.22	1.500D
RA-226	372.26	186.32	539.	90.	0.045	108.32	1.500s
PB-212	477.84	239.11	502.	603.	0.302	19.94	1.500
PB-214	591.18	295.76	229.	167.	0.083	44.94	1.500
AC-228	677.45	338.89	182.	149.	0.075	45.60	1.500
PB-214	705.02	352.67	154.	244.	0.122	28.86	1.500
TL-208	1023.32	511.77	90.	92.	0.046	59.76	1.165s
TL-208	1168.32	584.24	56.	225.	0.112	26.02	1.271
BI-214	1220.88	610.51	63.	194.	0.097	29.76	1.048
BI-212	1457.29	728.67	71.	35.	0.018	113.19	1.554s
CS-134	1592.67	796.32	38.	27.	0.014	112.36	1.601s
AC-228	1825.66	912.76	25.	131.	0.066	30.67	1.679
K-40	2927.74	1463.42	7.	691.	0.345	11.53	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		8.9082E-03					
			477.56	8.908E-03	%(	3.531E-01	1.01E-01 G
K-40		1.4216E+01					
			1460.75	1.422E+01	(P	3.137E-01	5.46E-01 G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
MN-54	-4.4460E-04						
		834.81	-4.446E-04	%(P	4.073E-02	1.12E-02	G
CO-57	-8.6413E-04						
		122.07	-8.641E-04	&(	5.561E-02	1.66E-02	G K
		136.43	-7.369E-02	%	4.098E-01	1.23E-01	G
CO-60	-1.1691E-02						
		1332.51	-1.169E-02	%(P	6.757E-02	1.94E-02	G K
		1173.23	2.513E-02	%	5.428E-02	1.64E-02	G K
Sr-85	-1.1492E-04						
		514.00	-1.149E-04	&(	5.643E-02	1.64E-02	G
Kr-85	-5.5225E-01						
		513.99	-5.523E-01	&(	1.234E+03	3.58E+02	G
Y-88	2.1065E-03						
		1836.01	2.107E-03	%(P	4.117E-02	1.05E-02	G K
		898.02	1.107E-02	& P	5.685E-02	1.64E-02	G
NB-94	0.0000E+00						
		871.10	0.000E+00	%(	5.078E-02	1.42E-02	G K
		702.50	4.559E-03	%	4.396E-02	1.26E-02	G K
Ag-108M	-2.4872E-03						
		722.95	-2.487E-03	%(	5.067E-02	1.44E-02	G K
		614.37	-3.151E-02	% P	6.126E-02	1.86E-02	G
		433.93	-5.104E-03	%	3.999E-02	1.16E-02	G
CD-109	-7.1362E-02						
		88.04	-7.136E-02	%(P	2.063E+00	6.16E-01	G
SN-113	1.3172E-03						
		391.71	1.317E-03	%(	5.647E-02	1.63E-02	G K
		255.04	-4.873E-02	%	1.835E+00	5.40E-01	G
SB-125	-2.0581E-03						
		427.95	-2.058E-03	%(P	1.152E-01	3.28E-02	G K
		600.77	-3.304E-03	% P	2.197E-01	6.22E-02	G
		636.15	2.523E-02	& P	2.857E-01	8.03E-02	G
		463.51	2.382E-01	% P	4.038E-01	1.24E-01	G
		176.29	-6.941E-02	& P	6.238E-01	1.85E-01	G
I-131	2.0586E-03						
		364.48	2.059E-03	&(	6.746E-02	1.96E-02	G K
		636.97	5.207E-02	%	8.601E-01	2.45E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
		284.29	-1.856E-01	%	9.403E-01	2.79E-01	G
CS-134	2.3471E-02						
		604.66	7.543E-03	%(	3.888E-02	1.13E-02	G K
		795.76	4.167E-02	(	4.832E-02	1.56E-02	G
		569.29	1.081E-01	%	2.455E-01	7.41E-02	G
		801.84	1.638E-03	% P	4.636E-01	1.28E-01	G
CS-137	-9.4248E-03						
		661.62	-9.425E-03	%(	5.220E-02	1.52E-02	G
CE-139	1.1320E-02						
		165.85	1.132E-02	%(P	4.334E-02	1.30E-02	G
EU-152	-1.7884E-02						
		121.78	-1.788E-02	&(P	1.637E-01	4.89E-02	G K
		344.30	-3.606E-02	%	1.458E-01	4.34E-02	G
		1408.08	5.785E-02	&	2.036E-01	5.87E-02	G
		964.00	-3.224E-02	% P	3.271E-01	9.20E-02	G
		1112.07	-4.557E-02	%	4.221E-01	1.20E-01	G
		778.90	-4.715E-02	% P	4.172E-01	1.20E-01	G
EU-154	1.7190E-02						
		123.10	1.719E-02	%(P	1.066E-01	3.19E-02	G K
		1274.80	2.918E-04	%	1.817E-01	5.06E-02	G
		723.30	-1.160E-03	& P	2.524E-01	7.15E-02	G
		1004.80	1.136E-02	%	2.516E-01	6.96E-02	G
EU-155	-1.8166E-02						
		86.45	-1.817E-02	%(P	2.583E-01	7.72E-02	G K
		105.31	7.912E-02	&	2.268E-01	6.84E-02	G
HG-203	3.0182E-03						
		279.17	3.018E-03	%(P	4.783E-02	1.41E-02	G K
		72.87	-4.104E-02	%	1.247E+00	3.70E-01	G
		70.83	7.987E-01	%	3.549E+00	1.07E+00	G
		82.50	-3.623E-01	&	3.823E+00	1.14E+00	G
TL-208	2.5607E-01						
		583.14	2.561E-01	(P	4.288E-02	2.23E-02	G
		510.72	3.520E-01	+	1.798E-01	7.03E-02	G
PB-212	5.8482E-01						
		238.63	5.848E-01	(	1.038E-01	3.89E-02	G K
							Energy duplication
		77.11	8.015E-01	+	5.382E-01	1.69E-01	G
		74.81	8.660E-01	& P	1.102E+00	3.37E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
PB-214	4.0720E-01						
		351.99	3.916E-01	(P	9.729E-02	3.77E-02	G K
		295.22	4.372E-01	(	1.919E-01	6.55E-02	G
							Energy duplication
		77.11	1.311E+00	+	8.802E-01	2.76E-01	G
		241.92	3.272E-01	%	6.412E-01	1.95E-01	G
BI-212	3.5907E-01						
		727.17	3.591E-01	*(	4.270E-01	1.35E-01	G K
		1620.56	1.096E-01	& P	1.379E+00	3.57E-01	G
		785.42	1.715E-02	& P	2.423E+00	6.83E-01	G
BI-214	4.2992E-01						
		609.32	4.299E-01	(	8.797E-02	4.27E-02	G K
		1764.51	-3.933E-02	& P	3.095E-01	8.40E-02	G
		1120.28	1.326E-02	&	4.439E-01	1.26E-01	G
RA-224	6.3217E-01						
		241.00	6.322E-01	&(P	1.232E+00	3.74E-01	G
RA-226	9.7309E-01						
		185.99	9.731E-01	*(P	1.199E+00	3.69E-01	G
AC-228	6.7972E-01						
		911.07	6.664E-01	(P	1.317E-01	6.82E-02	G K
		968.90	1.783E-02	% P	3.177E-01	9.00E-02	G
		338.40	7.119E-01	(	3.133E-01	1.08E-01	G
TH-227	2.8824E-03						
		236.00	2.882E-03	&(P	5.245E-01	1.56E-01	G K
		256.25	2.558E-02	%	5.198E-01	1.53E-01	G
PA-234	-5.1188E-02						
		98.44	-5.119E-02	&(	2.316E-01	6.96E-02	G K
		946.00	-2.570E-02	%	2.392E-01	6.78E-02	G
		131.28	-5.351E-02	&	2.342E-01	7.03E-02	G
		94.67	-7.814E-02	%	4.300E-01	1.29E-01	G
		883.24	-1.652E-03	%	3.443E-01	9.48E-02	G
		926.70	0.000E+00	%	4.412E-01	1.23E-01	G
		569.26	1.596E-01	%	3.626E-01	1.09E-01	G
TH-234	-2.2903E-01						
		63.29	-2.290E-01	&(P	4.299E+00	1.28E+00	G K
		92.80	1.455E+00	&	2.261E+00	6.90E-01	G
		92.38	1.724E+00	& P	2.677E+00	8.16E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
AM-241	1.4966E-01						
		59.54	1.497E-01	&(	6.141E-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:
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	8.3392E-03	8.9082E-03	3.0197E-01	3.0197E-01	3.306E-01
K-40		1.4216E+01	1.4216E+01	1.6393E+00	1.8231E+00	3.137E-01
MN-54	#A	-4.3961E-04	-4.4460E-04	1.6483E-01	1.6483E-01	4.028E-02
CO-57	#B	-8.5293E-04	-8.6413E-04	4.9658E-02	4.9658E-02	5.489E-02
CO-60	#B	-1.1670E-02	-1.1691E-02	5.9887E-02	5.9891E-02	6.745E-02
Sr-85	#A	-1.0884E-04	-1.1492E-04	4.9111E-02	4.9111E-02	5.345E-02
Kr-85	#A	-5.5223E-01	-5.5225E-01	1.0734E+03	1.0734E+03	1.234E+03
Y-88	#B	2.0380E-03	2.1065E-03	3.1436E-02	3.1436E-02	3.983E-02
NB-94	#B	0.0000E+00	0.0000E+00	4.2739E-02	4.2739E-02	5.078E-02
Ag-108M	#B	-2.4870E-03	-2.4872E-03	4.3211E-02	4.3212E-02	5.067E-02
CD-109	#A	-7.0809E-02	-7.1362E-02	3.1376E+00	3.1376E+00	2.047E+00

SN-113	#B	1.2774E-03	1.3172E-03	4.8912E-02	4.8912E-02	5.476E-02
SB-125	#B	-2.0509E-03	-2.0581E-03	1.1212E+00	1.1212E+00	1.148E-01
I-131	#B	1.3280E-03	2.0586E-03	5.8698E-02	5.8698E-02	4.352E-02
CS-134	#B	2.3361E-02	2.3471E-02	2.6371E-02	2.6404E-02	3.869E-02
CS-137	#A	-9.4217E-03	-9.4248E-03	4.5536E-02	4.5539E-02	5.218E-02
CE-139	#A	1.1033E-02	1.1320E-02	3.8948E-02	3.8954E-02	4.224E-02
EU-152	#B	-1.7870E-02	-1.7884E-02	1.6459E-01	1.6460E-01	1.636E-01
EU-154	#B	1.7170E-02	1.7190E-02	9.5649E-02	9.5654E-02	1.065E-01
EU-155	#B	-1.8130E-02	-1.8166E-02	4.3906E-01	4.3906E-01	2.578E-01
HG-203	#B	2.7983E-03	3.0182E-03	4.2184E-02	4.2184E-02	4.434E-02
TL-208		2.5607E-01	2.5607E-01	6.6743E-02	6.8272E-02	
PB-212	#	5.8482E-01	5.8482E-01	1.1660E-01	1.2113E-01	1.038E-01
PB-214	#	4.0720E-01	4.0720E-01	1.0879E-01	1.1116E-01	9.729E-02
BI-212	#A	3.5907E-01	3.5907E-01	4.0642E-01	4.0692E-01	4.270E-01
BI-214		4.2992E-01	4.2992E-01	1.2795E-01	1.3020E-01	
RA-224	#A	6.3217E-01	6.3217E-01	1.1223E+00	1.1229E+00	1.232E+00
RA-226	#A	9.7308E-01	9.7309E-01	1.1063E+00	1.1076E+00	1.199E+00
AC-228		6.7972E-01	6.7972E-01	1.8686E-01	1.9071E-01	1.317E-01
TH-227	#B	2.8824E-03	2.8824E-03	4.6842E-01	4.6842E-01	5.245E-01
PA-234	#B	-5.1188E-02	-5.1188E-02	2.0867E-01	2.0869E-01	2.316E-01
TH-234	#B	-2.2903E-01	-2.2903E-01	4.2026E+00	4.2026E+00	4.299E+00
AM-241	#A	1.4966E-01	1.4966E-01	5.5335E-01	5.5342E-01	6.140E-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) 1.5581400E+01 pCi/gm
Total Decayed Activity (295.2 to 1999.0 keV) 1.5581400E+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: 103_31JULY2006_1533.An1

Sample description
OOL-10-01-008-F-S WET

Spectrum Filename: C:\GammaVision\Spectra\103_31JULY2006_1533.An1

Acquisition information
Start time: 31-Jul-2006 15:34:20
Live time: 2000
Real time: 2002
Dead time: 0.12 %
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: 2.0780E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 2.0780E+03) =
4.8123E+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	28-Jul-2006 08:20:00
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. 17 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.1737

***** 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	115.	25.07	0.99	9.052E-03	74.81	9.600	8.604E-01	PB212
77.16	202.	12.06	0.99	1.011E-02	77.11	17.500	7.764E-01	PB212
93.07	106.	28.46	1.00	1.654E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
129.30	87.	39.20	1.10	2.440E-02				
186.13	151.	26.05	1.23	2.566E-02	185.99	3.280	PBC<MDA	RA226
209.42	116.	31.69	0.93	2.471E-02				
238.95	1148.	3.53	1.09	2.318E-02	238.63	43.100	7.392E-01	PB212
242.05	152.	18.83	1.10	2.302E-02	241.00	3.900	1.102E+00	RA224
					241.92	7.470	5.764E-01	PB214
270.44	87.	29.28	1.82	2.150E-02				
295.39	251.	14.26	1.06	2.024E-02	295.22	19.200	4.127E-01	PB214
300.41	93.	27.81	1.01	2.000E-02				
328.08	82.	28.69	1.29	1.874E-02				
338.52	240.	12.39	1.28	1.830E-02	338.40	12.010	7.068E-01	AC228
352.05	458.	7.90	1.08	1.775E-02	351.99	37.100	4.471E-01	PB214
462.75	102.	19.68	1.13	1.427E-02				
462.75	102.	19.68	1.13	1.427E-02	463.51	10.000	4.599E-01	SB125
511.24	193.	12.84	1.52	1.316E-02	510.72	22.500	3.641E-01	TL208
583.33	352.	6.95	1.53	1.184E-02	583.14	86.000	2.217E-01	TL208
609.51	388.	6.82	1.33	1.144E-02	609.32	46.090	4.706E-01	BI214
661.68	65.	33.25	1.59	1.072E-02	661.62	84.620	4.560E-02	CS137
727.50	109.	20.28	1.12	9.961E-03	727.17	11.800	6.001E-01	BI212
768.83	74.	27.56	1.43	9.548E-03				
795.68	69.	28.29	1.14	9.302E-03				
795.68	69.	28.29	1.14	9.302E-03	795.76	85.400	5.643E-02	CS134
911.38	261.	8.14	1.75	8.399E-03	911.07	29.000	6.887E-01	AC228

964.53	44.	26.66	1.54	8.053E-03	964.00	14.580	PBC<MDA	EU152
969.28	167.	9.47	1.54	8.023E-03	968.90	17.460	7.754E-01	AC228
1120.52	98.	15.07	2.13	7.211E-03	1120.28	15.040	5.750E-01	BI214
1461.17	1330.	2.77	2.01	5.931E-03	1460.75	10.700	1.343E+01	K40
1765.01	91.	10.48	1.69	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	
257.77	129.30	540.	85.	0.043	120.37	1.097	AC-228	
418.00	209.42	534.	116.	0.058	95.08	0.927	AC-228	s
540.04	270.44	266.	87.	0.043	87.83	1.819	AC-228	s
599.96	300.41	251.	93.	0.047	83.42	1.006	PB-212	s
655.31	328.08	207.	82.	0.041	86.08	1.289	AC-228	s
1536.71	768.83	114.	74.	0.037	70.45	1.430	BI-214	M
1928.84	964.56	41.	50.	0.025	69.05	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	382.	115.	0.057	75.21	0.993D
PB-212	153.39	77.11	393.	202.	0.101	36.18	0.995A
TH-234	185.15	92.99	968.	111.	0.055	105.26	1.500s
RA-226	371.59	186.21	849.	141.	0.070	83.28	1.500s
PB-212	477.14	238.99	694.	1241.	0.620	13.61	0.944
RA-224	482.95	241.90	837.	121.	0.061	104.66	1.500s
PB-214	589.93	295.39	371.	247.	0.123	42.78	1.064
AC-228	676.18	338.52	249.	239.	0.119	37.18	1.284
PB-214	703.23	352.05	300.	453.	0.226	23.70	1.082
SB-125	925.38	463.13	129.	88.	0.044	62.54	1.500s
TL-208	1021.59	511.24	171.	166.	0.083	38.51	1.516s
TL-208	1165.77	583.33	99.	347.	0.174	20.85	1.533
BI-214	1218.12	609.51	110.	382.	0.191	20.46	1.333
CS-137	1322.63	661.77	121.	50.	0.025	99.02	1.500
BI-212	1454.06	727.50	115.	109.	0.054	60.83	1.115
CS-134	1589.29	795.12	78.	41.	0.020	103.21	1.500s
AC-228	1821.78	911.38	77.	258.	0.129	24.42	1.755
AC-228	1936.81	968.90	40.	167.	0.084	28.16	1.541D
BI-214	2240.01	1120.52	46.	96.	0.048	45.20	2.132s
K-40	2921.21	1461.17	28.	1311.	0.656	8.32	2.008
BI-214	3528.77	1765.01	3.	88.	0.044	31.45	1.695s

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		1.2751E-02					
			477.56	1.275E-02	%(	2.346E-01 6.78E-02	G
K-40		1.3433E+01					
			1460.75	1.343E+01	(P	2.800E-01 3.78E-01	G
MN-54		-1.1160E-02					
			834.81	-1.116E-02	&(P	3.800E-02 1.13E-02	G
CO-57		-8.3591E-04					
			122.07	-8.359E-04	%(P	5.002E-02 1.49E-02	G K
			136.43	-3.259E-02	%	3.697E-01 1.11E-01	G
CO-60		1.1831E-03					
			1332.51	1.183E-03	%(P	3.184E-02 8.73E-03	G K
			1173.23	-1.031E-03	& P	4.185E-02 1.18E-02	G K
Sr-85		-1.3776E-02					
			514.00	-1.378E-02	%(	4.035E-02 1.21E-02	G
Kr-85		-3.0716E+02					
			513.99	-3.072E+02	%(	8.992E+02 2.70E+02	G
Y-88		-1.5994E-03					
			1836.01	-1.599E-03	%(P	2.069E-02 5.35E-03	G K
			898.02	-1.543E-03	% P	3.273E-02 9.25E-03	G
NB-94		8.8830E-03					
			871.10	8.883E-03	%(	2.300E-02 6.87E-03	G K
			702.50	-7.124E-03	&	3.662E-02 1.08E-02	G K
Ag-108M		-1.3443E-02					
			722.95	-1.344E-02	%(	4.036E-02 1.21E-02	G K
			614.37	-1.729E-02	& P	3.931E-02 1.19E-02	G
			433.93	8.251E-03	%	2.929E-02 8.72E-03	G
CD-109		7.3706E-01					
			88.04	7.371E-01	%(	1.737E+00 5.26E-01	G
SN-113		-2.3508E-04					
			391.71	-2.351E-04	%(	4.351E-02 1.27E-02	G K
			255.04	-8.463E-02	%	1.362E+00 4.03E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	9.5245E-02						
		427.95	-8.403E-03	%(P	8.631E-02	2.52E-02	G K
		600.77	1.625E-02	& P	1.487E-01	4.32E-02	G
		636.15	-3.043E-03	% P	2.427E-01	6.91E-02	G
		463.51	4.020E-01	@(P	2.549E-01	8.50E-02	G
		176.29	-1.277E-01	%	5.467E-01	1.64E-01	G
I-131	-4.3379E-04						
		364.48	-4.338E-04	&(P	4.569E-02	1.33E-02	G K
		636.97	1.398E-01	&	4.407E-01	1.31E-01	G
		284.29	5.744E-02	% P	5.140E-01	1.52E-01	G
CS-134	8.8757E-03						
		604.66	-1.262E-02	%(	3.279E-02	9.85E-03	G K
		795.76	3.344E-02	@(P	3.607E-02	1.15E-02	G
		569.29	-4.584E-02	& P	2.148E-01	6.31E-02	G
		801.84	-7.108E-02	% P	3.731E-01	1.08E-01	G
CS-137	3.6067E-02						
		661.62	3.607E-02	(P	3.871E-02	1.22E-02	G
CE-139	1.3441E-02						
		165.85	1.344E-02	%(	4.482E-02	1.35E-02	G
EU-152	-2.9302E-03						
		121.78	-2.930E-03	%(P	1.415E-01	4.21E-02	G K
		344.30	-5.006E-03	% P	1.080E-01	3.18E-02	G
		1408.08	1.306E-02	%	1.375E-01	3.85E-02	G
		964.00	2.270E-02	% P	3.021E-01	8.77E-02	G
		1112.07	7.637E-03	%	2.978E-01	8.52E-02	G
		778.90	-2.569E-02	%	2.062E-01	5.94E-02	G
EU-154	1.4904E-02						
		123.10	1.490E-02	%(	1.006E-01	3.01E-02	G K
		1274.80	1.175E-02	&	1.068E-01	3.07E-02	G
		723.30	-1.018E-01	%	2.130E-01	6.46E-02	G
		1004.80	-4.094E-02	%	2.041E-01	5.97E-02	G
EU-155	-1.0985E-02						
		86.45	-1.099E-02	%(	2.138E-01	6.38E-02	G K
		105.31	5.376E-03	%	1.631E-01	4.84E-02	G
HG-203	-1.0169E-02						
		279.17	-1.017E-02	&(P	4.091E-02	1.23E-02	G K
		72.87	-9.883E-01	& P	2.229E+00	6.75E-01	G
		70.83	9.254E-01	&	3.892E+00	1.17E+00	G
		82.50	-1.047E-01	%	3.689E+00	1.10E+00	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments

TL-208       2.2172E-01
                          583.14 2.217E-01  (P 3.129E-02 1.56E-02 G
                          510.72 3.641E-01 + P 1.397E-01 5.43E-02 G

PB-212       8.0673E-01
                          238.63 8.071E-01  (P 8.161E-02 3.70E-02 G K
                                                          Energy duplication
                           77.11 7.415E-01 } P 3.492E-01 8.94E-02 G
                           74.81 8.604E-01  (P 7.020E-01 2.22E-01 G

PB-214       4.3541E-01
                          351.99 4.471E-01  (P 8.239E-02 3.58E-02 G K
                          295.22 4.127E-01  (P 1.547E-01 5.98E-02 G
                                                          Energy duplication
                           77.11 2.804E-03 } P 7.794E-01 9.70E-02 G
                          241.92 2.101E-01 %   5.462E-01 1.65E-01 G

BI-212       6.0010E-01
                          727.17 6.001E-01  (P 2.920E-01 1.22E-01 G K
                         1620.56 3.461E-01 & P 9.094E-01 2.70E-01 G
                          785.42 7.475E-01 %   1.452E+00 4.42E-01 G

BI-214       4.7059E-01
                          609.32 4.706E-01  (P 6.376E-02 3.26E-02 G K
                         1764.51 6.970E-01 + P 8.850E-02 7.58E-02 G
                         1120.28 5.750E-01 + P 2.059E-01 8.84E-02 G

RA-224       8.7799E-01
                          241.00 8.780E-01 &(  9.941E-01 3.06E-01 G

RA-226       1.0891E+00
                          185.99 1.089E+00 *(P 1.070E+00 3.30E-01 G

AC-228       7.1848E-01
                          911.07 6.887E-01  (P 1.164E-01 5.68E-02 G K
                          968.90 7.759E-01  (P 1.490E-01 7.29E-02 G
                          338.40 7.068E-01  (P 2.256E-01 8.80E-02 G

TH-227       2.6481E-03
                          236.00 2.648E-03 %(  4.741E-01 1.42E-01 G K
                          256.25-2.897E-02 % P 3.587E-01 1.06E-01 G

PA-234       4.3255E-02
                           98.44 4.326E-02 &(P 1.962E-01 5.89E-02 G K
                          946.00 6.142E-03 & P 1.565E-01 4.45E-02 G
                          131.28 2.333E-03 & P 1.507E-01 4.47E-02 G
                           94.67-2.531E-01 % P 3.930E-01 1.20E-01 G
                          883.24 1.116E-02 %   2.518E-01 7.17E-02 G
                          926.70-8.884E-03 &   2.322E-01 6.51E-02 G
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 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26-7.181E-02 & P 3.184E-01 9.36E-02 G

TH-234       5.1803E-01
                           63.29-2.057E-01 &(P 5.544E+00 1.64E+00 G K
                           92.80 1.459E+00 *(P 1.946E+00 5.93E-01 G
                           92.38 1.688E+00 % P 2.318E+00 7.06E-01 G

AM-241      -1.7359E-01
                           59.54-1.736E-01 %(P 9.950E-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

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
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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	1.2216E-02	1.2751E-02	2.0325E-01	2.0325E-01	2.248E-01
K-40		1.3433E+01	1.3433E+01	1.1336E+00	1.3759E+00	
MN-54	#A	-1.1078E-02	-1.1160E-02	3.5439E-02	3.5445E-02	3.772E-02
CO-57	#B	-8.2885E-04	-8.3591E-04	6.2879E-02	6.2879E-02	4.960E-02
CO-60	#B	1.1817E-03	1.1831E-03	2.6191E-02	2.6192E-02	3.180E-02

Sr-85	#A	-1.3298E-02	-1.3776E-02	3.6353E-02	3.6361E-02	3.895E-02
Kr-85	#A	-3.0715E+02	-3.0716E+02	8.1017E+02	8.1037E+02	8.992E+02
Y-88	#B	-1.5654E-03	-1.5994E-03	1.7834E-02	1.7835E-02	2.025E-02
NB-94	#B	8.8830E-03	8.8830E-03	2.0603E-02	2.0609E-02	2.300E-02
Ag-108M	#B	-1.3442E-02	-1.3443E-02	3.6190E-02	3.6198E-02	4.035E-02
CD-109	#A	7.3335E-01	7.3706E-01	1.5776E+00	1.5781E+00	1.728E+00
SN-113	#B	-2.3045E-04	-2.3508E-04	3.8065E-02	3.8065E-02	4.265E-02
SB-125	#F	9.5030E-02	9.5245E-02	6.0428E-02	6.0680E-02	8.612E-02
I-131	#B	-3.2633E-04	-4.3379E-04	2.7713E+00	2.7713E+00	3.437E-02
CS-134	#B	8.8488E-03	8.8757E-03	9.1800E-03	9.1945E-03	3.269E-02
CS-137	#A	3.6060E-02	3.6067E-02	3.6698E-02	3.6758E-02	3.870E-02
CE-139	#A	1.3219E-02	1.3441E-02	4.0503E-02	4.0510E-02	4.408E-02
EU-152	#B	-2.9287E-03	-2.9302E-03	2.3997E-01	2.3997E-01	1.414E-01
EU-154	#B	1.4893E-02	1.4904E-02	9.0442E-02	9.0446E-02	1.006E-01
EU-155	#B	-1.0971E-02	-1.0985E-02	1.9153E-01	1.9153E-01	2.135E-01
HG-203	#B	-9.6814E-03	-1.0169E-02	3.6868E-02	3.6873E-02	3.895E-02
TL-208		2.2172E-01	2.2172E-01	4.6797E-02	4.8536E-02	
PB-212		8.0673E-01	8.0673E-01	1.1086E-01	1.2035E-01	
PB-214		4.3541E-01	4.3541E-01	1.0450E-01	1.0751E-01	
BI-212		6.0010E-01	6.0010E-01	3.6671E-01	3.6837E-01	
BI-214		4.7059E-01	4.7059E-01	9.7901E-02	1.0164E-01	
RA-224	#A	8.7799E-01	8.7799E-01	9.1887E-01	9.2028E-01	9.941E-01
RA-226	#	1.0891E+00	1.0891E+00	9.9033E-01	9.9235E-01	1.070E+00
AC-228		7.1848E-01	7.1848E-01	1.2676E-01	1.3345E-01	
TH-227	#B	2.6481E-03	2.6481E-03	4.2553E-01	4.2553E-01	4.741E-01
PA-234	#B	4.3255E-02	4.3255E-02	1.7665E-01	1.7667E-01	1.962E-01
TH-234	#B	5.1803E-01	5.1803E-01	6.3222E-01	6.3287E-01	5.544E+00
AM-241	#A	-1.7358E-01	-1.7359E-01	9.0944E-01	9.0949E-01	9.949E-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

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

Total Activity (1120.0 to 2000.7 keV) 1.6685831E+01 pCi/gm
Total Decayed Activity (1120.0 to 2000.7 keV) 1.6685831E+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-10-01-013-F

Spectrum Filename: C:\GammaVision\Spectra\103F_1AUG2006_1519.An1

Acquisition information

Start time:	01-Aug-2006 15:19:30
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:	1.8010E+03
Activity scaling factor:	1.0000E+06/(1.0000E+00* 1.8010E+03) = 5.5525E+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	28-Jul-2006 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. 14 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.2369

***** 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	98.	23.71	0.99	9.052E-03	74.81	9.600	8.474E-01	PB212
77.25	101.	20.26	0.99	1.011E-02	77.11	17.500	6.045E-01	PB212
					77.11	10.700	9.887E-01	PB214
93.30	75.	36.64	1.50	1.662E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
186.87	118.	29.15	0.87	2.564E-02	185.99	3.280	PBC<MDA	RA226
209.47	86.	30.81	0.96	2.470E-02				
238.97	708.	4.56	1.09	2.318E-02	238.63	43.100	5.225E-01	PB212
242.43	80.	26.26	1.10	2.299E-02	241.00	3.900	6.635E-01	RA224
					241.92	7.470	3.472E-01	PB214
277.73	53.	40.87	1.50	2.105E-02	279.17	81.500	PBC<MDA	HG203
295.42	193.	12.21	1.09	2.024E-02	295.22	19.200	3.654E-01	PB214
328.25	57.	35.51	1.07	1.873E-02				
338.48	151.	14.05	1.07	1.830E-02	338.40	12.010	5.117E-01	AC228
352.08	328.	8.32	1.17	1.775E-02	351.99	37.100	3.676E-01	PB214
463.18	55.	38.61	1.31	1.425E-02				
463.18	55.	38.61	1.31	1.425E-02	463.51	10.000	2.838E-01	SB125
511.16	146.	17.72	1.22	1.316E-02	510.72	22.500	3.011E-01	TL208
583.54	201.	8.90	1.15	1.184E-02	583.14	86.000	1.449E-01	TL208
609.45	264.	10.04	1.35	1.144E-02	609.32	46.090	3.668E-01	BI214
662.62	57.	30.23	1.11	1.071E-02	661.62	84.620	4.600E-02	CS137
727.48	47.	29.62	1.40	9.962E-03	727.17	11.800	2.993E-01	BI212
860.59	51.	26.56	1.41	8.767E-03				
911.17	181.	12.39	1.34	8.401E-03	911.07	29.000	5.477E-01	AC228
969.07	133.	15.86	2.25	8.025E-03	968.90	17.460	7.114E-01	AC228
1120.30	68.	25.79	1.94	7.212E-03	1120.28	15.040	4.601E-01	BI214
1461.27	1009.	3.20	1.78	5.930E-03	1460.75	10.700	1.171E+01	K40

1622.11	9.	39.30	0.66	5.488E-03	1620.56	2.750	4.304E-01	BI212
1764.96	59.	14.55	1.44	5.141E-03	1764.51	15.920	5.072E-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
418.10	209.47	290.	86.	0.043	92.42	0.961	AC-228
655.65	328.25	147.	57.	0.029	106.54	1.068	RH-106M s
1720.23	860.59	42.	51.	0.026	79.69	1.414	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	241.	98.	0.049	71.14	0.993D
PB-212	153.39	77.11	239.	101.	0.051	60.78	0.995A
TH-234	185.15	92.99	589.	116.	0.058	80.40	1.500s
TH-234	185.16	93.00	601.	95.	0.048	95.00	1.500s
RA-226	371.89	186.36	532.	86.	0.043	102.18	1.500s
PB-212	477.13	238.99	401.	729.	0.364	17.14	0.933
RA-224	482.93	241.89	492.	80.	0.040	122.47	1.500
HG-203	554.62	277.73	208.	53.	0.026	122.62	1.500s
PB-214	589.98	295.42	170.	189.	0.095	36.63	1.085
AC-228	676.10	338.48	131.	150.	0.075	42.15	1.073
PB-214	703.29	352.08	160.	323.	0.161	24.96	1.166
TL-208	1021.44	511.16	160.	119.	0.059	53.17	1.218s
TL-208	1166.18	583.54	58.	197.	0.098	26.69	1.151
BI-214	1218.00	609.45	125.	258.	0.129	30.12	1.353s
CS-137	1324.33	662.62	81.	56.	0.028	90.70	1.113s
BI-212	1454.03	727.48	58.	47.	0.023	88.87	1.398
AC-228	1821.35	911.16	68.	173.	0.086	34.51	1.334s
AC-228	1937.16	969.07	78.	133.	0.066	47.58	2.250s
BI-214	2239.58	1120.30	75.	67.	0.033	77.38	1.945
K-40	2921.41	1461.27	29.	990.	0.495	9.61	1.781
BI-212	3243.04	1622.11	1.	9.	0.004	117.90	0.656s
BI-214	3528.68	1764.96	8.	55.	0.028	43.64	1.440

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		1.5446E-01					
			477.56	1.545E-01	%(	2.703E-01 8.28E-02	G
K-40		1.1706E+01					
			1460.75	1.171E+01	(P	3.273E-01 3.82E-01	G
MN-54		8.4136E-03					
			834.81	8.414E-03	%(P	3.649E-02 1.07E-02	G
CO-57		-8.9829E-03					
			122.07	-8.983E-03	%(P	4.366E-02 1.31E-02	G K
			136.43	7.654E-03	&	3.047E-01 9.03E-02	G
CO-60		1.4875E-02					
			1332.51	1.487E-02	%(P	4.293E-02 1.26E-02	G K
			1173.23	-2.058E-03	% P	3.966E-02 1.09E-02	G K
Sr-85		-7.4618E-03					
			514.00	-7.462E-03	%(	3.734E-02 1.10E-02	G
Kr-85		-1.6459E+02					
			513.99	-1.646E+02	%(	8.236E+02 2.44E+02	G
Y-88		1.8953E-03					
			1836.01	1.895E-03	&(P	2.564E-02 6.71E-03	G K
			898.02	-2.890E-03	& P	3.699E-02 1.05E-02	G
NB-94		-5.5717E-03					
			871.10	-5.572E-03	%(	3.109E-02 9.00E-03	G K
			702.50	-1.623E-03	%	3.482E-02 1.00E-02	G K
Ag-108M		-6.7614E-03					
			722.95	-6.761E-03	%(	3.795E-02 1.11E-02	G K
			614.37	1.802E-03	% P	3.752E-02 1.08E-02	G
			433.93	-1.141E-03	&	3.147E-02 9.13E-03	G
CD-109		6.4810E-01					
			88.04	6.481E-01	%(	1.594E+00 4.82E-01	G
SN-113		-8.7096E-03					
			391.71	-8.710E-03	&(	4.379E-02 1.29E-02	G K
			255.04	3.517E-01	&	1.362E+00 4.07E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	-2.4033E-02						
		427.95	-2.403E-02	%(P	9.747E-02	2.89E-02	G K
		600.77	3.152E-03	& P	1.708E-01	4.90E-02	G
		636.15	1.242E-02	% P	2.439E-01	6.94E-02	G
		463.51	2.043E-01	% P	2.776E-01	8.62E-02	G
		176.29	-3.453E-02	%	4.858E-01	1.44E-01	G
I-131	5.0765E-03						
		364.48	5.076E-03	&(P	4.686E-02	1.37E-02	G K
		636.97	1.812E-03	%	5.587E-01	1.59E-01	G
		284.29	-6.682E-03	& P	5.351E-01	1.55E-01	G
CS-134	-4.0453E-03						
		604.66	-4.045E-03	%(	3.051E-02	8.86E-03	G K
		795.76	1.811E-02	% P	3.110E-02	9.59E-03	G
		569.29	1.910E-02	& P	1.691E-01	4.85E-02	G
		801.84	-4.755E-02	% P	3.817E-01	1.08E-01	G
CS-137	4.6003E-02						
		661.62	4.600E-02	@(P	3.702E-02	1.43E-02	G
CE-139	6.9615E-04						
		165.85	6.962E-04	&(	3.460E-02	1.02E-02	G
EU-152	-2.6623E-02						
		121.78	-2.662E-02	%(P	1.268E-01	3.79E-02	G K
		344.30	2.326E-02	& P	1.031E-01	3.06E-02	G
		1408.08	3.114E-02	%	1.246E-01	3.57E-02	G
		964.00	1.621E-01	% P	2.689E-01	8.27E-02	G
		1112.07	2.375E-02	&	2.658E-01	7.56E-02	G
		778.90	3.731E-02	%	2.298E-01	6.65E-02	G
EU-154	-1.1900E-02						
		123.10	-1.190E-02	%(	9.081E-02	2.71E-02	G K
		1274.80	5.852E-03	&	8.974E-02	2.50E-02	G
		723.30	-3.772E-02	%	1.833E-01	5.39E-02	G
		1004.80	2.738E-02	&	1.700E-01	4.87E-02	G
EU-155	7.7651E-02						
		86.45	7.765E-02	%(	1.997E-01	6.03E-02	G K
		105.31	-3.916E-02	%	1.987E-01	5.95E-02	G
HG-203	2.4687E-02						
		279.17	2.469E-02	&(P	3.260E-02	1.01E-02	G K
		72.87	-1.107E-02	% P	2.139E+00	6.36E-01	G
		70.83	-6.741E-02	&	4.184E+00	1.24E+00	G
		82.50	-6.708E-01	&	3.583E+00	1.07E+00	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments

TL-208       1.4488E-01
                          583.14 1.449E-01  (P 2.821E-02 1.32E-02 G
                          510.72 3.011E-01 + P 1.561E-01 6.54E-02 G

PB-212       5.6352E-01
                          238.63 5.469E-01  (P 7.208E-02 3.18E-02 G K
                                                          Energy duplication
                           77.11 4.283E-01 } P 3.167E-01 8.68E-02 G
                           74.81 8.474E-01 + P 6.476E-01 2.07E-01 G

PB-214       3.6685E-01
                          351.99 3.676E-01  (P 7.031E-02 3.11E-02 G K
                          295.22 3.654E-01  (P 1.224E-01 4.56E-02 G
                                                          Energy duplication
                           77.11 2.991E-01 } P 7.726E-01 1.85E-01 G
                          241.92 1.509E-01 %   4.841E-01 1.46E-01 G

BI-212       3.2408E-01
                          727.17 2.993E-01  (P 2.439E-01 8.96E-02 G K
                         1620.56 4.304E-01  (P 4.034E-01 1.70E-01 G
                          785.42 1.289E-01 %   1.035E+00 2.90E-01 G

BI-214       3.8974E-01
                          609.32 3.668E-01 @(P 7.808E-02 3.78E-02 G K
                         1764.51 5.072E-01 + P 1.432E-01 7.82E-02 G
                         1120.28 4.601E-01  (P 2.988E-01 1.22E-01 G

RA-224       6.6615E-01
                          241.00 6.661E-01 &(  8.844E-01 2.72E-01 G

RA-226       7.6673E-01
                          185.99 7.667E-01 @(P 9.819E-01 3.00E-01 G

AC-228       5.8124E-01
                          911.07 5.317E-01 @(P 1.270E-01 6.24E-02 G K
                          968.90 7.114E-01  (P 2.351E-01 1.13E-01 G
                          338.40 5.117E-01  (P 1.914E-01 7.24E-02 G

TH-227       1.5277E-02
                          236.00 1.528E-02 %(  4.422E-01 1.32E-01 G K
                          256.25-1.216E-03 % P 3.812E-01 1.12E-01 G

PA-234       3.4472E-02
                           98.44 3.447E-02 %(P 1.845E-01 5.51E-02 G K
                          946.00-5.071E-03 & P 2.070E-01 5.92E-02 G
                          131.28 6.874E-02 & P 1.525E-01 4.62E-02 G
                           94.67-1.285E-01 % P 3.604E-01 1.09E-01 G
                          883.24 5.651E-02 %   1.665E-01 4.89E-02 G
                          926.70 2.352E-02 &   2.613E-01 7.39E-02 G
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 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26 2.821E-02 & P 2.499E-01 7.17E-02 G

TH-234       1.6138E+00
                           63.29 1.440E+00 %(P 5.713E+00 1.71E+00 G K
                           92.80 1.450E+00  (P 1.779E+00 5.44E-01 G
                           92.38 2.070E+00  (P 2.073E+00 6.39E-01 G

AM-241      -6.9798E-02
                           59.54-6.980E-02 %(P 8.773E-01 2.60E-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	1.4612E-01	1.5446E-01	2.4845E-01	2.4861E-01	2.557E-01
K-40		1.1706E+01	1.1706E+01	1.1459E+00	1.3323E+00	
MN-54	#A	8.3341E-03	8.4136E-03	3.2116E-02	3.2120E-02	3.615E-02
CO-57	#B	-8.8848E-03	-8.9829E-03	4.0634E-02	4.0637E-02	4.318E-02
CO-60	#B	1.4852E-02	1.4875E-02	3.7859E-02	3.7869E-02	4.287E-02

Sr-85	#A	-7.1283E-03	-7.4618E-03	3.3127E-02	3.3130E-02	3.567E-02
Kr-85	#A	-1.6458E+02	-1.6459E+02	7.3060E+02	7.3066E+02	8.236E+02
Y-88	#B	1.8433E-03	1.8953E-03	2.0137E-02	2.0137E-02	2.494E-02
NB-94	#B	-5.5717E-03	-5.5717E-03	2.6990E-02	2.6992E-02	3.109E-02
Ag-108M	#B	-6.7610E-03	-6.7614E-03	3.3273E-02	3.3276E-02	3.795E-02
CD-109	#A	6.4387E-01	6.4810E-01	1.4458E+00	1.4463E+00	1.584E+00
SN-113	#B	-8.4881E-03	-8.7096E-03	3.8804E-02	3.8807E-02	4.268E-02
SB-125	#B	-2.3963E-02	-2.4033E-02	8.7162E-02	8.7173E-02	9.719E-02
I-131	#B	3.5108E-03	5.0765E-03	4.1143E-02	4.1144E-02	3.241E-02
CS-134	#B	-4.0294E-03	-4.0453E-03	2.6590E-02	2.6591E-02	3.039E-02
CS-137	#	4.5990E-02	4.6003E-02	4.2768E-02	4.2851E-02	
CE-139	#A	6.8130E-04	6.9615E-04	3.0635E-02	3.0635E-02	3.387E-02
EU-152	#B	-2.6606E-02	-2.6623E-02	1.2304E-01	1.2305E-01	1.267E-01
EU-154	#B	-1.1889E-02	-1.1900E-02	8.1258E-02	8.1261E-02	9.072E-02
EU-155	#B	7.7524E-02	7.7651E-02	1.8099E-01	1.8104E-01	1.994E-01
HG-203	#A	2.3165E-02	2.4687E-02	3.0293E-02	3.0327E-02	3.059E-02
TL-208		1.4488E-01	1.4488E-01	3.9518E-02	4.0403E-02	
PB-212		5.6352E-01	5.6352E-01	9.8199E-02	1.0351E-01	
PB-214		3.6685E-01	3.6685E-01	8.2948E-02	8.5639E-02	
BI-212		3.2408E-01	3.2408E-01	2.4094E-01	2.4168E-01	
BI-214		3.8974E-01	3.8974E-01	1.2035E-01	1.2246E-01	
RA-224	#A	6.6615E-01	6.6615E-01	8.1583E-01	8.1675E-01	8.844E-01
RA-226	#A	7.6672E-01	7.6673E-01	9.0139E-01	9.0249E-01	9.819E-01
AC-228		5.8124E-01	5.8124E-01	1.4118E-01	1.4515E-01	
TH-227	#B	1.5277E-02	1.5277E-02	3.9597E-01	3.9597E-01	4.422E-01
PA-234	#B	3.4472E-02	3.4472E-02	1.6543E-01	1.6544E-01	1.845E-01
TH-234	#B	1.6138E+00	1.6138E+00	1.4955E+00	1.4981E+00	5.713E+00
AM-241	#A	-6.9796E-02	-6.9798E-02	8.2141E-01	8.2142E-01	8.773E-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) 1.4122800E+01 pCi/gm
Total Decayed Activity (92.9 to 2000.7 keV) 1.4122812E+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_1AUG2006_1557.An1

Sample description
FSS-OOL-10-01-010-F

Spectrum Filename: C:\GammaVision\Spectra\103F_1AUG2006_1557.An1

Acquisition information
Start time: 01-Aug-2006 15:57:41
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: 2.0260E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 2.0260E+03) =
4.9358E+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	28-Jul-2006 08:19:00
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: 0.1650

***** 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
74.96	103.	25.31	0.99	9.052E-03	74.81	9.600	7.878E-01	PB212
77.26	147.	18.10	0.99	1.011E-02	77.11	17.500	7.098E-01	PB212
					77.11	10.700	1.161E+00	PB214
93.04	135.	28.86	1.50	1.645E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
93.05	134.	29.09	1.50	1.631E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
186.16	138.	28.38	1.10	2.566E-02	185.99	3.280	9.947E-01	RA226
209.70	94.	34.71	1.39	2.469E-02				
239.00	971.	3.91	1.09	2.318E-02	236.00	11.200	2.478E+00	TH227
					238.63	43.100	6.399E-01	PB212
241.61	111.	22.63	1.09	2.304E-02	241.00	3.900	8.193E-01	RA224
					241.92	7.470	4.287E-01	PB214
270.43	84.	35.89	1.64	2.150E-02				
295.31	212.	13.62	1.22	2.024E-02	295.22	19.200	3.568E-01	PB214
300.17	77.	30.88	1.24	2.001E-02				
338.32	221.	14.19	1.16	1.830E-02	338.40	12.010	6.673E-01	AC228
352.18	389.	7.45	1.12	1.775E-02	351.99	37.100	3.882E-01	PB214
463.20	65.	36.93	1.09	1.425E-02				
463.20	65.	36.93	1.09	1.425E-02	463.51	10.000	3.011E-01	SB125
511.13	191.	13.95	1.88	1.316E-02	510.72	22.500	3.689E-01	TL208
583.26	309.	8.41	1.30	1.184E-02	583.14	86.000	1.992E-01	TL208
609.51	313.	8.10	1.02	1.144E-02	609.32	46.090	3.878E-01	BI214
719.40	31.	28.85	1.50	1.001E-02	722.95	90.499	2.319E-02	Ag108M
727.89	109.	18.74	1.26	9.957E-03	727.17	11.800	6.166E-01	BI212
794.96	68.	28.64	1.27	9.308E-03				
794.96	68.	28.64	1.27	9.308E-03	795.76	85.400	5.683E-02	CS134

860.16	78.	24.45	1.71	8.771E-03				
911.59	250.	8.31	1.76	8.398E-03	911.07	29.000	6.760E-01	AC228
964.16	34.	36.77	1.54	8.054E-03	964.00	14.580	PBC<MDA	EU152
969.31	130.	11.19	1.54	8.022E-03	968.90	17.460	6.161E-01	AC228
1120.63	125.	19.63	2.04	7.210E-03	1120.28	15.040	7.583E-01	BI214

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
1461.30	1310.	2.87	1.66	5.930E-03	1460.75	10.700	1.357E+01	K40
1764.80	70.	13.62	2.38	5.142E-03	1764.51	15.920	5.731E-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	
418.56	209.70	424.	94.	0.047	104.12	1.388	NP-239	s
540.01	270.43	330.	84.	0.042	107.68	1.638	AC-228	s
599.49	300.17	222.	77.	0.038	92.64	1.241	PB-212	
1719.36	860.16	84.	78.	0.039	73.34	1.712	TL-208	s
1928.58	964.40	44.	51.	0.025	70.08	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	308.	103.	0.051	75.93	0.993D
PB-212	153.39	77.11	316.	147.	0.074	54.31	0.995A
TH-234	185.27	93.05	915.	134.	0.067	87.27	1.500s
TH-234	185.24	93.04	907.	135.	0.067	86.58	1.500s
RA-226	371.44	186.14	687.	108.	0.054	94.69	1.500s
PB-212	477.23	239.04	526.	915.	0.458	15.04	0.923
RA-224	482.71	241.78	633.	104.	0.052	107.05	1.500s
PB-214	589.77	295.31	263.	208.	0.104	40.86	1.216
AC-228	675.79	338.32	255.	220.	0.110	42.56	1.163
PB-214	703.51	352.18	186.	383.	0.192	22.34	1.117
SB-125	925.33	463.10	165.	50.	0.025	113.40	1.500
TL-208	1021.37	511.13	183.	164.	0.082	41.84	1.879s
TL-208	1165.63	583.26	115.	304.	0.152	25.22	1.305
BI-214	1218.11	609.51	116.	307.	0.153	24.30	1.021
Ag-108M	1437.87	719.40	26.	31.	0.016	86.55	1.500s
BI-212	1454.85	727.89	97.	109.	0.054	56.23	1.255s
CS-134	1590.02	795.48	69.	40.	0.020	98.99	1.500
AC-228	1822.20	911.59	66.	247.	0.123	24.92	1.762s
EU-152	1929.02	965.00	58.	42.	0.021	88.37	1.538s
AC-228	1936.81	968.90	38.	130.	0.065	33.18	1.541D
BI-214	2240.24	1120.63	111.	123.	0.062	58.89	2.036s
K-40	2921.47	1461.30	41.	1291.	0.646	8.61	1.656

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
BI-214	3528.36	1764.80	10.	70.	0.035	40.86	2.380

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		-9.5898E-02					
			477.56	-9.590E-02	%(	2.933E-01 8.77E-02	G
K-40		1.3567E+01					
			1460.75	1.357E+01	(P	3.417E-01 3.95E-01	G
MN-54		-3.3290E-03					
			834.81	-3.329E-03	%(P	3.205E-02 9.21E-03	G
CO-57		-2.7500E-03					
			122.07	-2.750E-03	%(P	4.588E-02 1.37E-02	G K
			136.43	-5.509E-02	%	3.713E-01 1.11E-01	G
CO-60		7.7352E-03					
			1332.51	7.735E-03	%(P	2.569E-02 7.30E-03	G K
			1173.23	1.309E-02	& P	3.265E-02 9.69E-03	G K
Sr-85		-1.6651E-02					
			514.00	-1.665E-02	%(	3.992E-02 1.20E-02	G
Kr-85		-3.6725E+02					
			513.99	-3.673E+02	%(	8.800E+02 2.66E+02	G
Y-88		-1.4822E-04					
			1836.01	-1.482E-04	&(P	1.966E-02 4.81E-03	G K
			898.02	7.982E-06	& P	3.376E-02 9.51E-03	G
NB-94		1.2796E-02					
			871.10	1.280E-02	&(	2.468E-02 7.54E-03	G K
			702.50	-7.052E-04	%	3.083E-02 8.85E-03	G K
Ag-108M		2.3191E-02					
			722.95	2.319E-02	?(	1.933E-02 6.69E-03	G K
			614.37	-8.601E-03	& P	3.562E-02 1.05E-02	G
			433.93	-6.006E-03	%	3.071E-02 9.08E-03	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CD-109	4.1080E-01						
		88.04	4.108E-01	&(	1.251E+00	3.76E-01	G
SN-113	-8.7299E-03						
		391.71	-8.730E-03	%(	4.424E-02	1.31E-02	G K
		255.04	1.578E-02	%	1.541E+00	4.56E-01	G
SB-125	7.5930E-02						
		427.95	2.189E-02	%(P	9.021E-02	2.68E-02	G K
		600.77	4.405E-02	& P	1.460E-01	4.34E-02	G
		636.15	-3.482E-02	& P	2.671E-01	7.75E-02	G
		463.51	2.359E-01	(P	2.939E-01	9.14E-02	G
		176.29	-8.040E-03	&	5.204E-01	1.55E-01	G
I-131	4.3381E-03						
		364.48	4.338E-03	%(P	4.521E-02	1.33E-02	G K
		636.97	-9.684E-02	%	6.263E-01	1.83E-01	G
		284.29	2.199E-01	% P	6.530E-01	1.96E-01	G
CS-134	1.6814E-02						
		604.66	1.673E-03	&(	2.972E-02	8.59E-03	G K
		795.76	3.412E-02	(P	3.500E-02	1.13E-02	G
		569.29	2.561E-02	& P	1.813E-01	5.27E-02	G
		801.84	-2.491E-02	% P	3.265E-01	9.16E-02	G
CS-137	6.6305E-03						
		661.62	6.630E-03	%(P	3.859E-02	1.13E-02	G
CE-139	-9.9853E-03						
		165.85	-9.985E-03	%(	4.059E-02	1.22E-02	G
EU-152	7.4115E-02						
		121.78	-8.385E-03	%(P	1.332E-01	3.97E-02	G K
		344.30	-2.995E-02	% P	1.068E-01	3.19E-02	G
		1408.08	8.025E-02	%	1.207E-01	3.83E-02	G
		964.00	2.396E-01	(P	2.176E-01	7.15E-02	G
		1112.07	-6.371E-02	%	3.583E-01	1.05E-01	G
		778.90	-5.785E-03	%	2.720E-01	7.83E-02	G
EU-154	-1.5670E-02						
		123.10	-1.567E-02	%(	1.003E-01	3.00E-02	G K
		1274.80	2.846E-02	&	9.593E-02	2.82E-02	G
		723.30	-9.799E-02	%	2.161E-01	6.54E-02	G
		1004.80	-1.299E-02	&	2.063E-01	5.91E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
EU-155	9.0137E-03						
		86.45	9.014E-03	%(	1.840E-01	5.48E-02	G K
		105.31	5.099E-02	%	2.120E-01	6.37E-02	G
HG-203	6.0120E-03						
		279.17	6.012E-03	%(P	3.512E-02	1.04E-02	G K
		72.87	3.072E-02	% P	1.505E+00	4.46E-01	G
		70.83	-8.426E-01	%	4.011E+00	1.20E+00	G
		82.50	1.082E-01	%	3.631E+00	1.08E+00	G
TL-208	1.9925E-01						
		583.14	1.992E-01	(P	3.445E-02	1.70E-02	G
		510.72	3.689E-01	+ P	1.480E-01	5.99E-02	G
PB-212	6.3920E-01						
		238.63	6.105E-01	(P	7.309E-02	3.10E-02	G K
							Energy duplication
		77.11	5.543E-01	} P	3.222E-01	1.00E-01	G
		74.81	7.878E-01	+ P	6.489E-01	2.05E-01	G
PB-214	3.7750E-01						
		351.99	3.882E-01	(P	6.704E-02	2.93E-02	G K
		295.22	3.568E-01	(P	1.343E-01	4.95E-02	G
							Energy duplication
		77.11	8.132E-02	} P	8.028E-01	1.89E-01	G
		241.92	2.354E-01	%	4.953E-01	1.50E-01	G
BI-212	6.1664E-01						
		727.17	6.166E-01	*(P	2.761E-01	1.16E-01	G K
		1620.56	-1.973E-03	% P	9.321E-01	2.46E-01	G
		785.42	1.069E+00	%	1.470E+00	4.60E-01	G
BI-214	3.8779E-01						
		609.32	3.878E-01	(P	6.705E-02	3.21E-02	G K
		1764.51	5.731E-01	+ P	1.402E-01	8.17E-02	G
		1120.28	7.583E-01	+ P	3.182E-01	1.51E-01	G
RA-224	7.6868E-01						
		241.00	7.687E-01	&(	8.890E-01	2.74E-01	G
RA-226	8.5929E-01						
		185.99	8.593E-01	*(P	9.889E-01	3.04E-01	G
AC-228	6.5670E-01						
		911.07	6.760E-01	@(P	1.111E-01	5.69E-02	G K
		968.90	6.173E-01	(P	1.502E-01	6.83E-02	G
		338.40	6.673E-01	(P	2.341E-01	9.51E-02	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments

TH-227      -2.1729E-01
                          236.00-2.173E-01 %(  3.451E-01 1.05E-01 G K
                          256.25 5.347E-02 & P 3.941E-01 1.17E-01 G

PA-234      -2.2544E-02
                           98.44-2.254E-02 &(P 2.017E-01 6.02E-02 G K
                          946.00-1.098E-02 % P 1.566E-01 4.46E-02 G
                          131.28-2.260E-02 % P 1.919E-01 5.73E-02 G
                           94.67 5.378E-03 % P 3.211E-01 9.54E-02 G
                          883.24 3.036E-02 %   2.532E-01 7.29E-02 G
                          926.70 8.202E-02 &   2.225E-01 6.62E-02 G
                          569.26 3.658E-02 & P 2.774E-01 8.07E-02 G

TH-234       1.5059E+00
                           63.29 8.514E-01 %(P 5.631E+00 1.68E+00 G K
                           92.80 1.820E+00  (P 1.934E+00 5.94E-01 G
                           92.38 2.133E+00  (P 2.287E+00 7.02E-01 G

AM-241      -1.6737E-01
                           59.54-1.674E-01 &(P 1.017E+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	-9.0670E-02	-9.5898E-02	2.6313E-01	2.6319E-01	2.774E-01
K-40		1.3567E+01	1.3567E+01	1.1855E+00	1.4234E+00	
MN-54	#A	-3.2972E-03	-3.3290E-03	3.2490E-02	3.2491E-02	3.175E-02
CO-57	#B	-2.7197E-03	-2.7500E-03	4.5585E-02	4.5585E-02	4.537E-02
CO-60	#B	7.7232E-03	7.7352E-03	2.1893E-02	2.1898E-02	2.565E-02
Sr-85	#A	-1.5899E-02	-1.6651E-02	3.6149E-02	3.6162E-02	3.812E-02
Kr-85	#A	-3.6724E+02	-3.6725E+02	7.9694E+02	7.9722E+02	8.800E+02
Y-88	#B	-1.4411E-04	-1.4822E-04	5.5703E-02	5.5703E-02	1.912E-02
NB-94	#B	1.2796E-02	1.2796E-02	2.2623E-02	2.2636E-02	2.468E-02
Ag-108M	#	2.3189E-02	2.3191E-02	2.0072E-02	2.0117E-02	1.933E-02
CD-109	#A	4.0810E-01	4.1080E-01	1.1289E+00	1.1291E+00	1.242E+00
SN-113	#B	-8.5058E-03	-8.7299E-03	3.9319E-02	3.9322E-02	4.310E-02
SB-125	#B	7.5705E-02	7.5930E-02	8.8289E-02	8.8399E-02	8.994E-02
I-131	#B	2.9896E-03	4.3381E-03	3.9761E-02	3.9762E-02	3.116E-02
CS-134	#B	1.6748E-02	1.6814E-02	1.6680E-02	1.6709E-02	2.960E-02
CS-137	#A	6.6287E-03	6.6305E-03	3.3871E-02	3.3873E-02	3.858E-02
CE-139	#A	-9.7702E-03	-9.9853E-03	3.6549E-02	3.6554E-02	3.971E-02
EU-152	#B	7.4067E-02	7.4115E-02	6.6343E-02	6.6470E-02	1.331E-01
EU-154	#B	-1.5655E-02	-1.5670E-02	9.0130E-02	9.0135E-02	1.002E-01
EU-155	#B	8.9988E-03	9.0137E-03	1.6427E-01	1.6427E-01	1.837E-01
HG-203	#B	5.6378E-03	6.0120E-03	3.1308E-02	3.1310E-02	3.293E-02
TL-208		1.9925E-01	1.9925E-01	5.0958E-02	5.2254E-02	
PB-212		6.3920E-01	6.3920E-01	9.7384E-02	1.0422E-01	
PB-214		3.7750E-01	3.7750E-01	8.5569E-02	8.8331E-02	
BI-212	#	6.1664E-01	6.1664E-01	3.4833E-01	3.5016E-01	
BI-214		3.8779E-01	3.8779E-01	9.6239E-02	9.8837E-02	
RA-224	#A	7.6868E-01	7.6868E-01	8.2284E-01	8.2405E-01	8.890E-01
RA-226	#A	8.5929E-01	8.5929E-01	9.1086E-01	9.1222E-01	9.889E-01
AC-228		6.5670E-01	6.5670E-01	1.3080E-01	1.3625E-01	
TH-227	#B	-2.1729E-01	-2.1729E-01	3.1594E-01	3.1619E-01	3.451E-01
PA-234	#B	-2.2544E-02	-2.2544E-02	2.0537E-01	2.0538E-01	2.017E-01
TH-234	#B	1.5059E+00	1.5059E+00	1.4746E+00	1.4770E+00	5.631E+00
AM-241	#A	-1.6737E-01	-1.6737E-01	9.2980E-01	9.2984E-01	1.017E+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) 1.6444479E+01 pCi/gm
Total Decayed Activity (1120.0 to 2000.7 keV) 1.6444479E+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_1AUG2006_1635.An1

Sample description
FSS-OOL-10-01-005-F

Spectrum Filename: C:\GammaVision\Spectra\103F_1AUG2006_1635.An1

Acquisition information
Start time: 01-Aug-2006 16:35:19
Live time: 2000
Real time: 2002
Dead time: 0.12 %
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: 1.9750E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.9750E+03) =
5.0633E+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	28-Jul-2006 07:44:00
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. 15 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.1754

***** 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	130.	21.78	0.99	9.069E-03	74.81	9.600	9.995E-01	PB212
77.24	233.	12.65	0.99	1.019E-02	77.11	10.700	1.451E+00	PB214
					77.11	17.500	8.872E-01	PB212
128.77	87.	41.48	1.22	2.434E-02				
186.40	150.	26.90	1.56	2.565E-02	185.99	3.280	1.118E+00	RA226
239.00	1035.	3.77	1.09	2.318E-02	238.63	43.100	7.003E-01	PB212
241.73	158.	16.76	1.09	2.303E-02	241.00	3.900	1.203E+00	RA224
					241.92	7.470	6.296E-01	PB214
270.34	87.	29.58	0.99	2.151E-02				
278.21	67.	40.50	1.15	2.110E-02				
278.21	67.	40.50	1.15	2.110E-02	279.17	81.500	PBC<MDA	HG203
295.38	255.	12.36	0.86	2.024E-02	295.22	19.200	4.420E-01	PB214
327.84	67.	26.91	1.19	1.875E-02				
338.35	204.	14.51	0.98	1.830E-02	338.40	12.010	6.310E-01	AC228
352.10	452.	6.68	1.17	1.775E-02	351.99	37.100	4.641E-01	PB214
430.20	44.	30.02	0.94	1.513E-02				
463.01	81.	25.26	1.05	1.426E-02				
463.01	81.	25.26	1.05	1.426E-02	463.51	10.000	3.850E-01	SB125
510.96	165.	13.90	1.25	1.317E-02	510.72	22.500	3.203E-01	TL208
583.29	359.	7.96	1.27	1.184E-02	583.14	86.000	2.382E-01	TL208
609.46	347.	7.25	1.38	1.144E-02	609.32	46.090	4.414E-01	BI214
727.22	99.	20.81	1.12	9.964E-03	727.17	11.800	5.738E-01	BI212
795.41	37.	32.75	1.50	9.301E-03	795.76	85.400	PBC<MDA	CS134
861.20	56.	24.14	1.33	8.763E-03				
911.50	260.	9.03	1.60	8.398E-03	911.07	29.000	7.199E-01	AC228
968.11	186.	12.31	1.84	8.031E-03	968.90	17.460	9.094E-01	AC228
1120.57	102.	18.30	1.40	7.210E-03	1120.28	15.040	6.315E-01	BI214

1461.28	1244.	2.92	1.98	5.930E-03	1460.75	10.700	1.321E+01	K40
1764.93	93.	10.37	1.69	5.141E-03	1764.51	15.920	7.500E-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
539.82	270.34	263.	87.	0.044	88.74	0.986	AC-228
555.57	278.21	277.	67.	0.033	111.93	1.146	SB-126 s
654.82	327.84	137.	67.	0.034	80.74	1.189	AC-228
1721.44	861.20	50.	56.	0.028	72.42	1.334	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	340.	126.	0.063	65.75	0.993D
PB-212	153.39	77.11	320.	176.	0.088	41.06	0.995A
RA-226	371.63	186.23	715.	133.	0.066	81.06	1.500s
PB-212	477.14	238.99	585.	995.	0.498	14.53	0.918
RA-224	482.93	241.89	704.	146.	0.073	80.95	1.500
PB-214	482.86	241.85	704.	121.	0.060	97.10	1.500
PB-214	589.91	295.38	289.	251.	0.126	37.09	0.860
AC-228	675.85	338.35	249.	203.	0.101	43.52	0.975
PB-214	703.35	352.10	183.	447.	0.223	20.05	1.172
SB-125	925.57	463.22	130.	64.	0.032	82.13	1.500s
TL-208	1021.03	510.96	156.	139.	0.069	41.69	1.252s
TL-208	1165.68	583.29	147.	355.	0.177	23.88	1.271
BI-214	1218.01	609.46	112.	340.	0.170	21.75	1.381
BI-212	1453.58	727.25	118.	102.	0.051	68.66	1.125s
CS-134	1589.88	795.41	54.	37.	0.018	98.26	1.500s
AC-228	1822.02	911.50	82.	256.	0.128	27.08	1.599
AC-228	1935.23	968.11	90.	186.	0.093	36.94	1.835s
BI-214	2240.11	1120.57	79.	100.	0.050	54.90	1.396s
K-40	2921.43	1461.28	40.	1225.	0.613	8.76	1.981
BI-214	3528.62	1764.93	3.	90.	0.045	31.11	1.690s

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		1.9426E-02					
			477.56	1.943E-02	&(	2.777E-01 8.07E-02	G
K-40		1.3211E+01					
			1460.75	1.321E+01	(P	3.450E-01 3.92E-01	G
MN-54		1.5475E-02					
			834.81	1.548E-02	%(P	3.091E-02 9.39E-03	G
CO-57		3.8270E-03					
			122.07	3.827E-03	%(P	4.848E-02 1.45E-02	G K
			136.43	-4.381E-02	&	3.708E-01 1.11E-01	G
CO-60		-2.8572E-03					
			1332.51	-2.857E-03	%(P	3.872E-02 1.06E-02	G K
			1173.23	-8.047E-04	% P	4.385E-02 1.24E-02	G K
Sr-85		-1.8006E-02					
			514.00	-1.801E-02	%(	4.394E-02 1.33E-02	G
Kr-85		-3.9676E+02					
			513.99	-3.968E+02	%(	9.680E+02 2.92E+02	G
Y-88		4.3263E-03					
			1836.01	4.326E-03	%(P	2.307E-02 6.33E-03	G K
			898.02	-2.990E-03	% P	3.128E-02 8.83E-03	G
NB-94		5.8728E-03					
			871.10	5.873E-03	%(	3.269E-02 9.52E-03	G K
			702.50	-4.952E-03	%	3.142E-02 9.17E-03	G K
Ag-108M		-6.7452E-03					
			722.95	-6.745E-03	%(	3.656E-02 1.07E-02	G K
			614.37	-1.611E-02	% P	3.496E-02 1.06E-02	G
			433.93	-3.952E-03	%	3.269E-02 9.61E-03	G
CD-109		2.6282E-02					
			88.04	2.628E-02	%(	1.935E+00 5.77E-01	G
SN-113		2.7046E-04					
			391.71	2.705E-04	%(	4.833E-02 1.41E-02	G K
			255.04	4.302E-01	%	1.451E+00 4.36E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	5.2894E-02						
		427.95	-3.389E-02	%(P	1.035E-01	3.10E-02	G K
		600.77	-1.587E-03	& P	1.664E-01	4.79E-02	G
		636.15	-7.053E-02	% P	2.697E-01	7.95E-02	G
		463.51	3.098E-01	*(P	2.687E-01	8.65E-02	G
		176.29	-1.138E-01	%	5.513E-01	1.65E-01	G
I-131	8.9780E-03						
		364.48	8.978E-03	&(P	4.825E-02	1.43E-02	G K
		636.97	-1.753E-01	%	5.732E-01	1.70E-01	G
		284.29	1.366E-02	% P	6.021E-01	1.76E-01	G
CS-134	1.4740E-02						
		604.66	0.000E+00	%(	6.653E-02	1.97E-02	G K
		795.76	3.159E-02	*(P	3.187E-02	1.04E-02	G
		569.29	-8.682E-03	% P	1.764E-01	5.01E-02	G
		801.84	7.709E-02	& P	3.040E-01	8.84E-02	G
CS-137	2.3248E-02						
		661.62	2.325E-02	%(P	3.490E-02	1.08E-02	G
CE-139	3.6359E-04						
		165.85	3.636E-04	%(	4.551E-02	1.35E-02	G
EU-152	1.0606E-02						
		121.78	1.061E-02	&(P	1.367E-01	4.08E-02	G K
		344.30	1.395E-02	& P	1.073E-01	3.17E-02	G
		1408.08	1.786E-03	%	1.426E-01	3.90E-02	G
		964.00	1.660E-01	% P	2.814E-01	8.63E-02	G
		1112.07	1.054E-01	&	2.786E-01	8.33E-02	G
		778.90	-8.261E-02	%	2.596E-01	7.72E-02	G
EU-154	-2.0880E-03						
		123.10	-2.088E-03	%(	1.030E-01	3.07E-02	G K
		1274.80	1.767E-03	&	8.745E-02	2.42E-02	G
		723.30	-6.926E-02	%	2.036E-01	6.09E-02	G
		1004.80	3.722E-02	%	1.800E-01	5.23E-02	G
EU-155	-1.5798E-03						
		86.45	-1.580E-03	%(	2.249E-01	6.71E-02	G K
		105.31	-3.638E-03	%	1.770E-01	5.25E-02	G
HG-203	-1.6411E-05						
		279.17	-1.641E-05	%(P	4.013E-02	1.18E-02	G K
		72.87	-3.798E-01	% P	2.091E+00	6.27E-01	G
		70.83	-1.109E+00	&	4.206E+00	1.27E+00	G
		82.50	1.616E+00	&	3.471E+00	1.05E+00	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	2.3825E-01						
		583.14	2.382E-01	(P	3.981E-02	1.92E-02	G
		510.72	3.203E-01	+ P	1.407E-01	5.31E-02	G
PB-212	6.8120E-01						
		238.63	6.812E-01	(P	7.896E-02	3.34E-02	G K
							Energy duplication
		77.11	6.812E-01	} P	3.325E-01	9.32E-02	G
		74.81	9.935E-01	+ P	6.977E-01	2.23E-01	G
PB-214	4.5938E-01						
		351.99	4.641E-01	(P	6.835E-02	3.14E-02	G K
		295.22	4.420E-01	(P	1.442E-01	5.56E-02	G
							Energy duplication
		77.11	1.314E-02	} P	7.740E-01	2.22E-01	G
		241.92	4.805E-01	(	5.026E-01	1.56E-01	G
BI-212	5.9299E-01						
		727.17	5.930E-01	*(P	3.105E-01	1.36E-01	G K
		1620.56	4.062E-02	& P	7.941E-01	2.08E-01	G
		785.42	6.662E-01	%	1.653E+00	4.97E-01	G
BI-214	4.4141E-01						
		609.32	4.414E-01	(P	6.748E-02	3.26E-02	G K
		1764.51	7.500E-01	+ P	9.311E-02	8.06E-02	G
		1120.28	6.315E-01	+ P	2.782E-01	1.18E-01	G
RA-224	1.1110E+00						
		241.00	1.111E+00	(	9.609E-01	3.00E-01	G
RA-226	1.0787E+00						
		185.99	1.079E+00	(P	1.035E+00	3.20E-01	G
AC-228	7.9112E-01						
		911.07	7.199E-01	(P	1.259E-01	6.59E-02	G K
		968.90	9.094E-01	@(P	2.288E-01	1.12E-01	G
		338.40	6.310E-01	- P	2.375E-01	9.20E-02	G
TH-227	6.0095E-02						
		236.00	6.010E-02	&(	2.768E-01	8.28E-02	G K
		256.25	1.475E-01	& P	3.875E-01	1.17E-01	G
PA-234	-1.7172E-02						
		98.44	-1.717E-02	%(P	2.125E-01	6.34E-02	G K
		946.00	2.451E-02	& P	1.394E-01	4.01E-02	G
		131.28	-3.199E-02	% P	1.976E-01	5.92E-02	G
		94.67	-3.764E-03	% P	2.838E-01	8.40E-02	G
		883.24	-1.458E-02	&	2.392E-01	6.79E-02	G
		926.70	3.763E-02	%	2.182E-01	6.24E-02	G

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 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26 3.565E-02 % P 2.484E-01 7.19E-02 G

TH-234       2.5288E+00
                           63.29 2.529E+00 %(P 5.592E+00 1.69E+00 G K
                           92.80 9.803E-01 % P 2.048E+00 6.18E-01 G
                           92.38 1.130E+00 & P 2.431E+00 7.34E-01 G

AM-241       7.2552E-03
                           59.54 7.255E-03 &(P 1.142E+00 3.40E-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	1.8355E-02	1.9426E-02	2.4218E-01	2.4219E-01	2.624E-01
K-40		1.3211E+01	1.3211E+01	1.1746E+00	1.4028E+00	
MN-54	#A	1.5326E-02	1.5475E-02	2.8180E-02	2.8194E-02	3.061E-02
CO-57	#B	3.7844E-03	3.8270E-03	4.3418E-02	4.3419E-02	4.794E-02
CO-60	#B	-2.8527E-03	-2.8572E-03	1.6794E-01	1.6794E-01	3.866E-02

Sr-85	#A	-1.7184E-02	-1.8006E-02	3.9781E-02	3.9795E-02	4.193E-02
Kr-85	#A	-3.9675E+02	-3.9676E+02	8.7647E+02	8.7677E+02	9.680E+02
Y-88	#B	4.2051E-03	4.3263E-03	1.8986E-02	1.8988E-02	2.243E-02
NB-94	#B	5.8728E-03	5.8728E-03	2.8561E-02	2.8563E-02	3.269E-02
Ag-108M	#B	-6.7448E-03	-6.7452E-03	3.2139E-02	3.2142E-02	3.655E-02
CD-109	#A	2.6107E-02	2.6282E-02	1.7317E+00	1.7317E+00	1.922E+00
SN-113	#B	2.6343E-04	2.7046E-04	4.2366E-02	4.2366E-02	4.708E-02
SB-125	#B	5.2736E-02	5.2894E-02	4.4301E-02	4.4407E-02	1.032E-01
I-131	#B	6.1602E-03	8.9780E-03	4.2814E-02	4.2818E-02	3.311E-02
CS-134	#B	1.4681E-02	1.4740E-02	1.4519E-02	1.4544E-02	6.627E-02
CS-137	#A	2.3242E-02	2.3248E-02	3.2334E-02	3.2362E-02	3.489E-02
CE-139	#A	3.5567E-04	3.6359E-04	4.0618E-02	4.0618E-02	4.452E-02
EU-152	#B	1.0599E-02	1.0606E-02	1.2239E-01	1.2239E-01	1.367E-01
EU-154	#B	-2.0859E-03	-2.0880E-03	9.2076E-02	9.2076E-02	1.029E-01
EU-155	#B	-1.5772E-03	-1.5798E-03	2.0119E-01	2.0119E-01	2.246E-01
HG-203	#B	-1.5378E-05	-1.6411E-05	2.7362E-03	2.7362E-03	3.760E-02
TL-208		2.3825E-01	2.3825E-01	5.7584E-02	5.9222E-02	
PB-212		6.8120E-01	6.8120E-01	1.0019E-01	1.0771E-01	
PB-214		4.5938E-01	4.5938E-01	9.3268E-02	9.7007E-02	
BI-212	#	5.9299E-01	5.9299E-01	4.0914E-01	4.1059E-01	
BI-214		4.4141E-01	4.4141E-01	9.7813E-02	1.0111E-01	
RA-224		1.1110E+00	1.1110E+00	8.9936E-01	9.0167E-01	9.609E-01
RA-226	#	1.0786E+00	1.0787E+00	9.5968E-01	9.6172E-01	1.035E+00
AC-228		7.9112E-01	7.9112E-01	1.8211E-01	1.8781E-01	
TH-227	#B	6.0095E-02	6.0095E-02	2.4844E-01	2.4847E-01	2.768E-01
PA-234	#B	-1.7172E-02	-1.7172E-02	2.2603E-01	2.2603E-01	2.125E-01
TH-234	#B	2.5288E+00	2.5288E+00	5.0717E+00	5.0736E+00	5.592E+00
AM-241	#A	7.2550E-03	7.2552E-03	1.0188E+00	1.0188E+00	1.142E+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) 1.7525946E+01 pCi/gm
Total Decayed Activity (87.4 to 2000.7 keV) 1.7525946E+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_1AUG2006_1712.An1

Sample description
FSS-OOL-10-01-021-F

Spectrum Filename: C:\GammaVision\Spectra\103F_1AUG2006_1712.An1

Acquisition information
Start time: 01-Aug-2006 17:12:22
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: 1.8470E+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%
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	28-Jul-2006 09:35:00
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: 0.1919

***** 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	125.	22.43	0.99	9.144E-03	74.81	9.600	1.028E+00	PB212
77.99	83.	38.77	1.00	1.060E-02	77.11	17.500	PBC<MDA	PB212
87.11	102.	28.79	1.00	1.435E-02	86.45	32.740	1.611E-01	EU155
					88.04	3.790	1.340E+00	CD109
90.18	69.	41.33	1.00	1.551E-02				
93.23	120.	24.87	1.00	1.659E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
135.21	104.	38.52	1.64	2.497E-02				
186.12	144.	22.74	0.83	2.566E-02	185.99	3.280	1.143E+00	RA226
209.86	92.	35.43	0.73	2.469E-02				
238.98	1217.	3.50	1.09	2.318E-02	238.63	43.100	8.818E-01	PB212
241.67	140.	18.58	1.09	2.304E-02	241.00	3.900	1.138E+00	RA224
					241.92	7.470	5.953E-01	PB214
270.76	111.	25.81	0.86	2.148E-02				
295.15	258.	11.64	1.11	2.025E-02	295.22	19.200	4.783E-01	PB214
299.97	78.	28.85	1.09	2.002E-02				
328.09	64.	38.34	0.63	1.874E-02				
338.67	288.	11.28	1.10	1.829E-02	338.40	12.010	9.547E-01	AC228
352.13	451.	7.19	1.02	1.775E-02	351.99	37.100	4.951E-01	PB214
429.23	43.	40.58	1.17	1.516E-02				
463.16	77.	22.90	1.33	1.426E-02				
463.16	77.	22.90	1.33	1.426E-02	463.51	10.000	3.895E-01	SB125
511.03	209.	13.62	1.22	1.317E-02	510.72	22.500	4.511E-01	TL208
583.22	425.	7.63	1.14	1.184E-02	583.14	86.000	3.020E-01	TL208
609.47	370.	7.81	1.27	1.144E-02	609.32	46.090	5.042E-01	BI214
727.38	116.	17.71	1.67	9.962E-03	727.17	11.800	7.200E-01	BI212
769.48	81.	26.19	1.06	9.542E-03				

795.23	81.	27.79	1.30	9.306E-03				
795.23	81.	27.79	1.30	9.306E-03	795.76	85.400	7.482E-02	CS134
860.86	51.	26.81	1.26	8.765E-03				
911.48	296.	7.05	1.74	8.398E-03	911.07	29.000	8.773E-01	AC228
965.12	60.	21.03	1.54	8.048E-03	964.00	14.580	PBC<MDA	EU152
969.24	182.	9.09	1.54	8.023E-03	968.90	17.460	9.496E-01	AC228
1120.61	124.	17.14	1.60	7.210E-03	1120.28	15.040	8.237E-01	BI214
1239.04	42.	38.23	1.31	6.698E-03				
1461.24	1336.	2.82	1.92	5.931E-03	1460.75	10.700	1.518E+01	K40
1620.45	21.	25.92	0.72	5.488E-03	1620.56	2.750	1.035E+00	BI212
1764.89	89.	10.60	1.97	5.141E-03	1764.51	15.920	7.663E-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
173.39	87.09	376.	102.	0.051	86.38	1.001	PB-214 lD
179.54	90.16	371.	69.	0.034	123.98	1.003	PB-214 lD
269.58	135.21	654.	104.	0.052	115.56	1.642	J-134 l
418.88	209.86	439.	92.	0.046	106.30	0.730	NP-239
540.67	270.76	308.	111.	0.055	77.44	0.861	AC-228 s
599.10	299.97	206.	78.	0.039	86.55	1.093	TH-227
655.33	328.09	234.	64.	0.032	115.03	0.635	AC-228 s
857.59	429.23	83.	73.	0.036	63.73	1.171	RH-106M
1538.01	769.48	113.	81.	0.041	64.62	1.062	BI-214 s
1720.76	860.86	53.	51.	0.026	80.44	1.262	TL-208
1930.04	965.21	58.	51.	0.026	75.74	1.539	AC-228 D
2477.01	1239.04	82.	42.	0.021	114.68	1.307	CO-56

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	337.	124.	0.062	66.47	0.993D
PB-212	153.39	77.11	347.	204.	0.102	35.85	0.995A
TH-234	185.44	93.14	1002.	118.	0.059	101.38	1.500s
TH-234	185.42	93.12	991.	117.	0.059	101.45	1.500s
RA-226	371.55	186.19	712.	148.	0.074	73.65	1.500
PB-212	477.13	238.99	583.	1154.	0.577	12.96	0.968
PB-214	482.46	241.65	334.	66.	0.033	118.15	1.410s
PB-214	589.45	295.15	273.	254.	0.127	34.92	1.110
AC-228	676.49	338.67	265.	287.	0.143	33.83	1.098s
PB-214	703.41	352.13	228.	446.	0.223	21.57	1.020
SB-125	925.72	463.30	168.	72.	0.036	82.82	1.500
TL-208	1021.18	511.03	204.	183.	0.091	40.86	1.217s
TL-208	1165.55	583.22	179.	420.	0.210	22.90	1.139
BI-214	1218.03	609.47	152.	363.	0.182	23.43	1.271
BI-212	1453.84	727.38	110.	116.	0.058	53.14	1.669s
CS-134	1589.45	795.19	71.	51.	0.026	80.72	1.500
AC-228	1821.99	911.48	59.	292.	0.146	21.16	1.745
AC-228	1936.81	968.90	50.	182.	0.091	27.73	1.541D

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
BI-214	2240.19	1120.61	93.	122.	0.061	51.41	1.602
K-40	2921.35	1461.24	37.	1317.	0.659	8.46	1.923
BI-212	3239.71	1620.45	3.	21.	0.011	77.75	0.716s
BI-214	3528.54	1764.89	3.	86.	0.043	31.80	1.967

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	%(	3.628E-01 1.06E-01 G	
K-40		1.5184E+01					
			1460.75	1.518E+01	(P	3.567E-01 4.34E-01 G	
MN-54		2.1696E-02					
			834.81	2.170E-02	%(P	3.399E-02 1.05E-02 G	
CO-57		3.8974E-03					
			122.07	3.897E-03	&(P	5.306E-02 1.58E-02 G K	
			136.43	4.252E-02	&	3.829E-01 1.14E-01 G	
CO-60		-3.7855E-03					
			1332.51	-3.786E-03	%(P	3.973E-02 1.08E-02 G K	
			1173.23	-8.909E-03	& P	5.469E-02 1.58E-02 G K	
Sr-85		-7.2931E-03					
			514.00	-7.293E-03	%(	4.187E-02 1.24E-02 G	
Kr-85		-1.6170E+02					
			513.99	-1.617E+02	%(	9.232E+02 2.73E+02 G	
Y-88		-9.5661E-05					
			1836.01	-9.566E-05	&(P	3.341E-02 8.87E-03 G K	
			898.02	1.033E-02	% P	3.575E-02 1.05E-02 G	
NB-94		2.1981E-03					
			871.10	2.198E-03	&(	2.252E-02 6.29E-03 G K	
			702.50	-2.115E-04	%	3.640E-02 1.05E-02 G K	
Ag-108M		-1.4704E-02					
			722.95	-1.470E-02	&(	5.175E-02 1.54E-02 G K	
			614.37	-1.402E-02	% P	4.076E-02 1.22E-02 G	

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
		433.93	-1.197E-02	%	3.596E-02	1.08E-02	G
CD-109	1.2421E+00						
		88.04	1.242E+00	%(	1.894E+00	5.78E-01	G
SN-113	-1.1588E-02						
		391.71	-1.159E-02	&(	5.256E-02	1.56E-02	G K
		255.04	-4.053E-03	&	1.690E+00	5.00E-01	G
SB-125	6.5063E-02						
		427.95	-3.765E-02	&(P	1.081E-01	3.24E-02	G K
		600.77	-8.802E-03	& P	1.933E-01	5.61E-02	G
		636.15	3.716E-02	% P	2.918E-01	8.49E-02	G
		463.51	3.691E-01	(P	3.246E-01	1.04E-01	G
		176.29	3.165E-02	%	5.832E-01	1.74E-01	G
I-131	9.2685E-04						
		364.48	9.269E-04	%(P	5.382E-02	1.57E-02	G K
		636.97	9.221E-02	%	6.050E-01	1.76E-01	G
		284.29	-2.044E-01	% P	8.381E-01	2.51E-01	G
CS-134	2.1101E-02						
		604.66	-2.088E-03	&(	7.030E-02	2.08E-02	G K
		795.76	4.760E-02	(P	3.870E-02	1.28E-02	G
		569.29	3.382E-02	% P	2.007E-01	5.86E-02	G
		801.84	-7.402E-02	% P	3.984E-01	1.15E-01	G
CS-137	-1.1195E-03						
		661.62	-1.119E-03	&(P	4.924E-02	1.42E-02	G
CE-139	1.5082E-02						
		165.85	1.508E-02	&(	4.886E-02	1.47E-02	G
EU-152	1.4003E-02						
		121.78	1.400E-02	%(P	1.538E-01	4.59E-02	G K
		344.30	-4.272E-03	& P	1.136E-01	3.33E-02	G
		1408.08	2.049E-02	%	1.428E-01	4.02E-02	G
		964.00	-2.380E-02	% P	4.850E-01	1.42E-01	G
		1112.07	-6.958E-02	%	3.320E-01	9.73E-02	G
		778.90	4.357E-02	%	2.651E-01	7.73E-02	G
EU-154	-7.8292E-03						
		123.10	-7.829E-03	&(	1.138E-01	3.40E-02	G K
		1274.80	2.374E-02	%	1.276E-01	3.71E-02	G
		723.30	-6.783E-02	&	2.449E-01	7.30E-02	G
		1004.80	0.000E+00	%	2.598E-01	7.45E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
EU-155	1.4649E-01						
		86.45	1.465E-01	%(	2.392E-01	7.29E-02	G K
		105.31	1.493E-03	&	2.093E-01	6.22E-02	G
HG-203	-1.9139E-03						
		279.17	-1.914E-03	%(P	4.632E-02	1.37E-02	G K
		72.87	-4.427E-01	% P	2.385E+00	7.16E-01	G
		70.83	9.866E-02	&	4.884E+00	1.46E+00	G
		82.50	-9.620E-01	%	3.887E+00	1.17E+00	G
TL-208	3.0202E-01						
		583.14	3.020E-01	(P	4.667E-02	2.33E-02	G
		510.72	4.511E-01	+ P	1.711E-01	7.04E-02	G
PB-212	8.4431E-01						
		238.63	8.443E-01	(P	8.433E-02	3.69E-02	G K
							Energy duplication
		77.11	8.443E-01	} P	3.698E-01	1.01E-01	G
		74.81	1.045E+00	+ P	7.427E-01	2.37E-01	G
PB-214	4.8934E-01						
		351.99	4.951E-01	(P	8.123E-02	3.61E-02	G K
		295.22	4.783E-01	(P	1.500E-01	5.66E-02	G
							Energy duplication
		77.11	3.163E-02	} P	8.006E-01	2.25E-01	G
		241.92	2.791E-01	-	3.741E-01	1.10E-01	G
BI-212	7.7957E-01						
		727.17	7.200E-01	*(P	3.214E-01	1.28E-01	G K
		1620.56	1.035E+00	(P	4.988E-01	2.69E-01	G
		785.42	3.238E-01	&	1.631E+00	4.76E-01	G
BI-214	5.0419E-01						
		609.32	5.042E-01	(P	8.340E-02	4.01E-02	G K
		1764.51	7.663E-01	+ P	9.956E-02	8.43E-02	G
		1120.28	8.237E-01	+ P	3.212E-01	1.43E-01	G
RA-224	6.7236E-01						
		241.00	6.724E-01	%(	9.926E-01	3.04E-01	G
RA-226	1.2850E+00						
		185.99	1.285E+00	(P	1.104E+00	3.43E-01	G
AC-228	9.1436E-01						
		911.07	8.773E-01	(P	1.155E-01	6.26E-02	G K
		968.90	9.482E-01	(P	1.869E-01	8.77E-02	G
		338.40	9.547E-01	@(P	2.616E-01	1.08E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TH-227	1.1917E-02						
		236.00	1.192E-02	&(	5.549E-01	1.66E-01	G K
		256.25	6.538E-02	& P	4.959E-01	1.48E-01	G
PA-234	5.2124E-03						
		98.44	5.212E-03	%(P	2.436E-01	7.26E-02	G K
		946.00	2.166E-03	& P	1.805E-01	5.12E-02	G
		131.28	6.976E-03	& P	2.291E-01	6.84E-02	G
		94.67	-1.250E-01	% P	4.363E-01	1.31E-01	G
		883.24	1.300E-01	&	2.576E-01	7.85E-02	G
		926.70	7.220E-02	%	2.808E-01	8.22E-02	G
		569.26	4.972E-02	% P	2.967E-01	8.66E-02	G
TH-234	1.8225E+00						
		63.29	1.729E+00	&(P	6.732E+00	2.02E+00	G K
		92.80	1.739E+00	(P	2.215E+00	6.76E-01	G
		92.38	2.062E+00	(P	2.622E+00	8.01E-01	G
AM-241	-3.9323E-02						
		59.54	-3.932E-02	&(P	1.158E+00	3.45E-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	0.0000E+00	0.0000E+00	3.1701E-01	3.1701E-01	3.431E-01
K-40		1.5184E+01	1.5184E+01	1.3026E+00	1.5728E+00	
MN-54	#A	2.1489E-02	2.1696E-02	3.1537E-02	3.1562E-02	3.366E-02
CO-57	#B	3.8544E-03	3.8974E-03	4.7533E-02	4.7533E-02	5.248E-02
CO-60	#B	-3.7797E-03	-3.7855E-03	3.0413E-01	3.0413E-01	3.967E-02
Sr-85	#A	-6.9641E-03	-7.2931E-03	3.7192E-02	3.7195E-02	3.998E-02
Kr-85	#A	-1.6170E+02	-1.6170E+02	8.2009E+02	8.2014E+02	9.232E+02
Y-88	#B	-9.3013E-05	-9.5661E-05	3.3526E-03	3.3526E-03	3.248E-02
NB-94	#B	2.1981E-03	2.1981E-03	1.8870E-02	1.8870E-02	2.252E-02
Ag-108M	#B	-1.4703E-02	-1.4704E-02	4.6289E-02	4.6297E-02	5.174E-02
CD-109	#A	1.2339E+00	1.2421E+00	1.7348E+00	1.7362E+00	1.881E+00
SN-113	#B	-1.1290E-02	-1.1588E-02	4.6888E-02	4.6893E-02	5.121E-02
SB-125	#B	6.4871E-02	6.5063E-02	5.4844E-02	5.4974E-02	1.078E-01
I-131	#B	6.3878E-04	9.2685E-04	4.7161E-02	4.7161E-02	3.709E-02
CS-134	#B	2.1017E-02	2.1101E-02	1.7062E-02	1.7106E-02	7.002E-02
CS-137	#A	-1.1192E-03	-1.1195E-03	1.1839E-01	1.1839E-01	4.923E-02
CE-139	#A	1.4757E-02	1.5082E-02	4.4157E-02	4.4166E-02	4.781E-02
EU-152	#B	1.3994E-02	1.4003E-02	1.3783E-01	1.3783E-01	1.537E-01
EU-154	#B	-7.8216E-03	-7.8292E-03	1.0200E-01	1.0200E-01	1.137E-01
EU-155	#B	1.4625E-01	1.4649E-01	2.1870E-01	2.1885E-01	2.388E-01
HG-203	#B	-1.7948E-03	-1.9139E-03	4.1900E-02	4.1900E-02	4.344E-02
TL-208		3.0202E-01	3.0202E-01	6.9886E-02	7.2052E-02	
PB-212		8.4431E-01	8.4431E-01	1.1056E-01	1.2094E-01	
PB-214		4.8934E-01	4.8934E-01	1.0193E-01	1.0582E-01	
BI-212		7.7957E-01	7.7957E-01	3.6810E-01	3.7087E-01	
BI-214		5.0419E-01	5.0419E-01	1.2026E-01	1.2377E-01	
RA-224	A	6.7236E-01	6.7236E-01	9.1107E-01	9.1191E-01	9.926E-01
RA-226	#	1.2850E+00	1.2850E+00	1.0294E+00	1.0321E+00	1.104E+00
AC-228		9.1436E-01	9.1436E-01	1.4873E-01	1.5792E-01	
TH-227	#B	1.1917E-02	1.1917E-02	4.9857E-01	4.9857E-01	5.549E-01
PA-234	#B	5.2124E-03	5.2124E-03	2.1794E-01	2.1794E-01	2.436E-01
TH-234	#B	1.8225E+00	1.8225E+00	2.1236E+00	2.1260E+00	6.732E+00
AM-241	#A	-3.9322E-02	-3.9323E-02	1.1317E+00	1.1317E+00	1.158E+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) 1.9018070E+01 pCi/gm
Total Decayed Activity (1120.0 to 2000.7 keV) 1.9018070E+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_1AUG2006_2005.An1

Sample description
FSS-OOL-10-01-001-F

Spectrum Filename: C:\GammaVision\Spectra\103F_1AUG2006_2005.An1

Acquisition information

Start time:	01-Aug-2006 20:06:04
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:	2.0530E+03
Activity scaling factor:	1.0000E+06/(1.0000E+00* 2.0530E+03) = 4.8709E+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	28-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. 19 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.2254

***** 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	139.	19.52	0.99	9.052E-03	74.81	9.600	1.055E+00	PB212
77.20	127.	18.89	0.99	1.011E-02	77.11	17.500	6.686E-01	PB212
					77.11	10.700	1.093E+00	PB214
93.33	122.	23.82	1.00	1.663E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
186.74	154.	22.64	1.07	2.564E-02	185.99	3.280	1.101E+00	RA226
209.38	110.	26.43	1.26	2.471E-02				
238.95	1045.	3.73	1.09	2.319E-02	238.63	43.100	6.801E-01	PB212
241.74	161.	16.74	1.09	2.304E-02	241.00	3.900	1.175E+00	RA224
					241.92	7.470	6.150E-01	PB214
270.83	82.	29.99	1.27	2.148E-02				
277.39	90.	34.23	1.42	2.114E-02				
295.24	285.	12.35	1.11	2.025E-02	295.22	19.200	4.753E-01	PB214
300.11	83.	25.47	1.16	2.001E-02				
328.08	68.	27.59	0.95	1.874E-02				
338.56	221.	13.99	1.17	1.829E-02	338.40	12.010	6.592E-01	AC228
351.98	410.	7.00	1.16	1.775E-02	351.99	37.100	4.046E-01	PB214
409.38	60.	39.03	1.22	1.575E-02				
463.39	91.	20.67	0.97	1.425E-02				
463.39	91.	20.67	0.97	1.425E-02	463.51	10.000	4.177E-01	SB125
510.76	155.	16.64	1.04	1.317E-02	510.72	22.500	2.841E-01	TL208
583.28	329.	7.04	1.58	1.184E-02	583.14	86.000	2.098E-01	TL208
609.58	295.	7.15	1.38	1.144E-02	609.32	46.090	3.602E-01	BI214
727.59	122.	15.56	1.60	9.960E-03	727.17	11.800	6.813E-01	BI212
794.93	63.	29.20	0.83	9.309E-03				
794.93	63.	29.20	0.83	9.309E-03	795.76	85.400	5.218E-02	CS134
861.12	59.	29.19	1.27	8.763E-03				

885.14	20.	37.11	1.31	8.584E-03				
911.29	237.	8.53	1.46	8.400E-03	911.07	29.000	6.307E-01	AC228
964.35	49.	22.42	1.54	8.053E-03	964.00	14.580	PBC<MDA	EU152
969.32	134.	10.57	1.54	8.022E-03	968.90	17.460	6.282E-01	AC228
1120.72	87.	20.79	1.27	7.210E-03	1120.28	15.040	5.165E-01	BI214
1461.21	1170.	3.02	1.91	5.931E-03	1460.75	10.700	1.194E+01	K40
1620.36	13.	36.85	0.69	5.488E-03	1620.56	2.750	5.869E-01	BI212
1765.06	48.	15.71	1.75	5.142E-03	1764.51	15.920	3.886E-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	351.	110.	0.055	79.30	1.261	AC-228	s
540.81	270.83	239.	82.	0.041	89.96	1.266	AC-228	s
553.94	277.39	320.	84.	0.042	96.62	1.418	TL-208	s
599.37	300.11	182.	83.	0.041	76.42	1.155	PB-212	
655.30	328.08	142.	68.	0.034	82.77	0.949	AC-228	
817.88	409.38	167.	60.	0.030	117.08	1.224	AC-228	
1721.28	861.12	75.	59.	0.030	87.56	1.268	TL-208	
1928.70	964.49	28.	56.	0.028	56.96	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	318.	139.	0.070	58.57	0.993D
PB-212	153.39	77.11	355.	127.	0.063	56.66	0.995A
TH-234	185.60	93.21	901.	129.	0.064	89.61	1.500s
TH-234	185.60	93.22	885.	127.	0.064	89.66	1.500s
RA-226	372.12	186.48	715.	144.	0.072	75.69	1.500s
PB-212	477.03	238.94	615.	1032.	0.516	14.52	1.004
RA-224	482.52	241.68	738.	152.	0.076	79.43	1.500
PB-214	482.42	241.63	337.	72.	0.036	105.36	1.144
PB-214	589.62	295.24	344.	281.	0.140	37.05	1.112
AC-228	676.26	338.56	264.	220.	0.110	41.96	1.170
PB-214	703.11	351.98	172.	405.	0.202	21.01	1.159
SB-125	925.54	463.21	136.	76.	0.038	72.20	1.500s
TL-208	1020.64	510.76	185.	128.	0.064	49.91	1.043s
TL-208	1165.66	583.28	84.	325.	0.162	21.13	1.585s
BI-214	1218.25	609.58	71.	289.	0.144	21.44	1.381
BI-212	1454.26	727.59	75.	122.	0.061	46.68	1.605
CS-134	1589.55	795.25	64.	41.	0.021	94.62	1.500s
AC-228	1821.61	911.29	65.	233.	0.117	25.59	1.463
AC-228	1936.81	968.90	35.	134.	0.067	31.91	1.541D
BI-214	2240.41	1120.72	82.	85.	0.043	62.36	1.275
K-40	2921.29	1461.21	37.	1152.	0.576	9.05	1.912
BI-212	3239.54	1620.36	5.	13.	0.007	110.55	0.689s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
BI-214	3528.87	1765.06	8.	48.	0.024	47.12	1.753

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		-6.8747E-02					
			477.56	-6.875E-02	%(	2.911E-01 8.63E-02	G
K-40		1.1943E+01					
			1460.75	1.194E+01	(P	3.233E-01 3.66E-01	G
MN-54		-1.0544E-03					
			834.81	-1.054E-03	&(P	3.589E-02 1.03E-02	G
CO-57		4.5409E-03					
			122.07	4.541E-03	%(P	4.481E-02 1.34E-02	G K
			136.43	6.149E-02	%	3.510E-01 1.05E-01	G
CO-60		-2.2083E-04					
			1332.51	-2.208E-04	&(P	2.899E-02 7.75E-03	G K
			1173.23	6.994E-03	& P	3.677E-02 1.06E-02	G K
Sr-85		-1.1867E-02					
			514.00	-1.187E-02	%(	3.912E-02 1.17E-02	G
Kr-85		-2.6129E+02					
			513.99	-2.613E+02	%(	8.605E+02 2.58E+02	G
Y-88		-8.6176E-05					
			1836.01	-8.618E-05	%(P	2.240E-02 5.65E-03	G K
			898.02	-4.096E-04	% P	3.323E-02 9.34E-03	G
NB-94		-3.2556E-03					
			871.10	-3.256E-03	%(	3.053E-02 8.78E-03	G K
			702.50	-3.435E-05	&	2.930E-02 8.36E-03	G K
Ag-108M		6.0955E-04					
			722.95	6.096E-04	%(	3.895E-02 1.12E-02	G K
			614.37	-1.438E-02	& P	3.420E-02 1.03E-02	G
			433.93	-4.897E-04	%	2.701E-02 7.81E-03	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CD-109	-2.5290E-02						
		88.04	-2.529E-02	%(	1.850E+00	5.52E-01	G
SN-113	-6.1780E-03						
		391.71	-6.178E-03	&(	4.327E-02	1.28E-02	G K
		255.04	-4.385E-01	%	1.588E+00	4.77E-01	G
SB-125	1.1354E-01						
		427.95	3.275E-02	&(P	8.452E-02	2.54E-02	G K
		600.77	3.248E-02	& P	1.516E-01	4.46E-02	G
		636.15	2.342E-02	% P	2.322E-01	6.69E-02	G
		463.51	3.527E-01	*(P	2.644E-01	8.63E-02	G
		176.29	9.090E-02	%	5.131E-01	1.54E-01	G
I-131	4.5672E-03						
		364.48	4.567E-03	%(P	3.881E-02	1.13E-02	G K
		636.97	1.481E-01	%	5.476E-01	1.62E-01	G
		284.29	1.859E-01	& P	6.072E-01	1.82E-01	G
CS-134	1.4597E-02						
		604.66	-2.567E-03	%(	2.809E-02	8.13E-03	G K
		795.76	3.421E-02	@(P	3.326E-02	1.08E-02	G
		569.29	1.280E-02	% P	1.832E-01	5.29E-02	G
		801.84	3.816E-02	% P	3.114E-01	8.89E-02	G
CS-137	1.5543E-02						
		661.62	1.554E-02	%(P	3.585E-02	1.08E-02	G
CE-139	-8.5574E-04						
		165.85	-8.557E-04	&(	4.006E-02	1.19E-02	G
EU-152	1.4258E-02						
		121.78	1.426E-02	%(P	1.299E-01	3.88E-02	G K
		344.30	-6.086E-03	& P	1.051E-01	3.09E-02	G
		1408.08	4.264E-02	%	1.276E-01	3.75E-02	G
		964.00	-5.288E-03	% P	3.065E-01	8.83E-02	G
		1112.07	6.656E-02	&	2.662E-01	7.82E-02	G
		778.90	-4.348E-02	%	2.088E-01	6.09E-02	G
EU-154	-1.1108E-02						
		123.10	-1.111E-02	&(	9.734E-02	2.91E-02	G K
		1274.80	-1.707E-02	%	1.085E-01	3.14E-02	G
		723.30	-7.051E-03	%	9.847E-02	2.76E-02	G
		1004.80	-4.012E-02	&	1.780E-01	5.20E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
EU-155	4.5597E-03						
		86.45	4.560E-03	&(	2.145E-01	6.40E-02	G K
		105.31	4.798E-02	%	2.063E-01	6.20E-02	G
HG-203	2.4176E-03						
		279.17	2.418E-03	&(P	3.785E-02	1.12E-02	G K
		72.87	-6.382E-01	& P	2.118E+00	6.38E-01	G
		70.83	-9.450E-02	%	3.074E+00	9.11E-01	G
		82.50	-6.002E-01	%	3.349E+00	1.00E+00	G
TL-208	2.0981E-01						
		583.14	2.098E-01	(P	2.940E-02	1.50E-02	G
		510.72	2.841E-01	+ P	1.468E-01	5.71E-02	G
PB-212	6.7628E-01						
		238.63	6.794E-01	(P	7.786E-02	3.33E-02	G K
							Energy duplication
		77.11	4.707E-01	} P	3.367E-01	8.89E-02	G
		74.81	1.055E+00	+ P	6.503E-01	2.11E-01	G
PB-214	4.2873E-01						
		351.99	4.046E-01	(P	6.381E-02	2.87E-02	G K
		295.22	4.753E-01	(P	1.510E-01	5.96E-02	G
							Energy duplication
		77.11	2.723E-01	} P	8.066E-01	1.88E-01	G
		241.92	2.767E-01	-	3.377E-01	9.71E-02	G
BI-212	6.6346E-01						
		727.17	6.813E-01	(P	2.415E-01	1.06E-01	G K
		1620.56	5.869E-01	(P	5.515E-01	2.17E-01	G
		785.42	5.682E-01	&	1.289E+00	3.89E-01	G
BI-214	3.6751E-01						
		609.32	3.602E-01	(P	5.257E-02	2.63E-02	G K
		1764.51	3.886E-01	(P	1.256E-01	6.52E-02	G
		1120.28	5.165E-01	+ P	2.724E-01	1.10E-01	G
RA-224	1.1148E+00						
		241.00	1.115E+00	(	9.458E-01	2.95E-01	G
RA-226	1.1233E+00						
		185.99	1.123E+00	*(P	9.957E-01	3.09E-01	G
AC-228	6.3626E-01						
		911.07	6.307E-01	(P	1.085E-01	5.46E-02	G K
		968.90	6.298E-01	(P	1.421E-01	6.71E-02	G
		338.40	6.592E-01	(P	2.348E-01	9.27E-02	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments

TH-227       5.3607E-03
                          236.00 5.361E-03 &(  4.537E-01 1.36E-01 G K
                          256.25-9.461E-02 & P 4.325E-01 1.29E-01 G

PA-234      -4.7098E-03
                           98.44-4.710E-03 %(P 2.044E-01 6.09E-02 G K
                          946.00 1.147E-02 % P 1.065E-01 2.98E-02 G
                          131.28-1.943E-02 & P 1.891E-01 5.65E-02 G
                           94.67 2.063E-03 % P 3.470E-01 1.03E-01 G
                          883.24-5.151E-02 &   2.237E-01 6.52E-02 G
                          926.70 0.000E+00 %   2.766E-01 7.80E-02 G
                          569.26 1.869E-02 % P 2.708E-01 7.82E-02 G

TH-234       1.2064E+00
                           63.29 2.895E-01 &(P 5.796E+00 1.72E+00 G K
                           92.80 1.699E+00  (P 1.885E+00 5.78E-01 G
                           92.38 2.023E+00  (P 2.240E+00 6.87E-01 G

AM-241      -1.1983E-02
                           59.54-1.198E-02 %(P 8.718E-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

- -

***** 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	-6.4828E-02	-6.8747E-02	2.5892E-01	2.5895E-01	2.745E-01
K-40		1.1943E+01	1.1943E+01	1.0985E+00	1.2990E+00	
MN-54	#A	-1.0439E-03	-1.0544E-03	5.1629E-02	5.1630E-02	3.553E-02
CO-57	#B	4.4885E-03	4.5409E-03	4.0140E-02	4.0141E-02	4.429E-02
CO-60	#B	-2.2047E-04	-2.2083E-04	2.7297E-02	2.7297E-02	2.894E-02
Sr-85	#A	-1.1307E-02	-1.1867E-02	3.5122E-02	3.5129E-02	3.727E-02
Kr-85	#A	-2.6128E+02	-2.6129E+02	7.7264E+02	7.7279E+02	8.605E+02
Y-88	#B	-8.3680E-05	-8.6176E-05	2.1356E-03	2.1356E-03	2.175E-02
NB-94	#B	-3.2556E-03	-3.2556E-03	2.6350E-02	2.6350E-02	3.053E-02
Ag-108M	#B	6.0951E-04	6.0955E-04	3.3724E-02	3.3724E-02	3.894E-02
CD-109	#A	-2.5116E-02	-2.5290E-02	1.6559E+00	1.6559E+00	1.837E+00
SN-113	#B	-6.0120E-03	-6.1780E-03	3.8269E-02	3.8271E-02	4.210E-02
SB-125	#F	1.1319E-01	1.1354E-01	8.3350E-02	8.3611E-02	8.426E-02
I-131	#B	3.0928E-03	4.5672E-03	3.4004E-02	3.4005E-02	2.628E-02
CS-134	#B	1.4536E-02	1.4597E-02	1.3841E-02	1.3867E-02	2.797E-02
CS-137	#A	1.5539E-02	1.5543E-02	3.2348E-02	3.2360E-02	3.584E-02
CE-139	#A	-8.3645E-04	-8.5574E-04	3.5714E-02	3.5714E-02	3.916E-02
EU-152	#B	1.4248E-02	1.4258E-02	1.1637E-01	1.1637E-01	1.298E-01
EU-154	#B	-1.1097E-02	-1.1108E-02	8.7318E-02	8.7321E-02	9.724E-02
EU-155	#B	4.5518E-03	4.5597E-03	1.9191E-01	1.9191E-01	2.141E-01
HG-203	#B	2.2603E-03	2.4176E-03	3.3584E-02	3.3585E-02	3.539E-02
TL-208		2.0981E-01	2.0981E-01	4.4923E-02	4.6545E-02	
PB-212		6.7628E-01	6.7628E-01	9.9300E-02	1.0678E-01	
PB-214		4.2873E-01	4.2873E-01	9.1346E-02	9.4677E-02	
BI-212		6.6346E-01	6.6346E-01	3.1097E-01	3.1335E-01	
BI-214		3.6751E-01	3.6751E-01	8.0563E-02	8.3341E-02	
RA-224		1.1148E+00	1.1148E+00	8.8549E-01	8.8786E-01	9.458E-01
RA-226	#	1.1233E+00	1.1233E+00	9.2685E-01	9.2914E-01	9.957E-01
AC-228		6.3626E-01	6.3626E-01	1.2497E-01	1.3032E-01	
TH-227	#B	5.3607E-03	5.3607E-03	4.0700E-01	4.0700E-01	4.537E-01
PA-234	#B	-4.7098E-03	-4.7098E-03	3.4039E-01	3.4039E-01	2.044E-01
TH-234	#B	1.2064E+00	1.2064E+00	1.2292E+00	1.2310E+00	5.796E+00
AM-241	#A	-1.1982E-02	-1.1983E-02	1.0132E+00	1.0132E+00	8.718E-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) 1.6040201E+01 pCi/gm
Total Decayed Activity (1120.0 to 2000.7 keV) 1.6040201E+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-10-01-024-F

Spectrum Filename: C:\GammaVision\Spectra\103F_2AUG2006_0954.An1

Acquisition information

Start time:	02-Aug-2006 09:55:43
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:	1.7070E+03
Activity scaling factor:	1.0000E+06/(1.0000E+00* 1.7070E+03) = 5.8582E+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_2AUG2006_0954.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	28-Jul-2006 09:55:00
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. 16 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.1640

***** 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	108.	24.19	0.99	9.052E-03	74.81	9.600	9.840E-01	PB212
77.21	166.	16.67	0.99	1.011E-02	77.11	17.500	9.862E-01	PB212
					77.11	10.700	1.613E+00	PB214
87.28	100.	29.73	1.00	1.448E-02	86.45	32.740	1.721E-01	EU155
					88.04	3.790	1.433E+00	CD109
89.70	78.	35.18	1.00	1.539E-02				
93.32	84.	33.03	1.00	1.667E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
128.74	99.	33.95	0.88	2.433E-02				
186.24	111.	26.80	1.37	2.566E-02	185.99	3.280	PBC<MDA	RA226
209.43	114.	33.04	1.08	2.471E-02				
238.98	1085.	3.60	1.09	2.318E-02	238.63	43.100	8.494E-01	PB212
241.38	129.	27.34	1.09	2.305E-02	241.00	3.900	1.139E+00	RA224
					241.92	7.470	5.958E-01	PB214
270.12	88.	30.40	1.49	2.152E-02				
295.27	229.	12.69	0.98	2.025E-02	295.22	19.200	4.589E-01	PB214
300.23	63.	40.32	0.90	2.001E-02				
328.73	74.	29.35	1.36	1.871E-02				
338.41	234.	14.78	1.01	1.830E-02	338.40	12.010	8.396E-01	AC228
351.99	438.	7.67	1.10	1.775E-02	351.99	37.100	5.191E-01	PB214
462.61	86.	23.20	1.43	1.427E-02				
462.61	86.	23.20	1.43	1.427E-02	463.51	10.000	4.724E-01	SB125
511.00	170.	13.19	1.28	1.317E-02	510.72	22.500	3.818E-01	TL208
583.29	330.	7.79	1.40	1.184E-02	583.14	86.000	2.528E-01	TL208
609.46	336.	7.98	1.13	1.144E-02	609.32	46.090	4.951E-01	BI214
727.70	72.	23.70	1.37	9.959E-03	727.17	11.800	4.828E-01	BI212
768.33	75.	29.80	1.17	9.553E-03				

795.36	56.	23.09	1.54	9.305E-03				
795.36	56.	23.09	1.54	9.305E-03	795.76	85.400	5.548E-02	CS134
861.48	60.	24.27	1.28	8.760E-03				
911.39	249.	9.74	1.61	8.399E-03	911.07	29.000	7.994E-01	AC228
964.79	37.	27.89	1.54	8.049E-03				
969.28	146.	9.66	1.54	8.022E-03	968.90	17.460	8.253E-01	AC228
1120.59	100.	19.68	1.59	7.210E-03	1120.28	15.040	7.190E-01	BI214
1461.25	1097.	3.20	1.84	5.931E-03	1460.75	10.700	1.345E+01	K40
1765.15	85.	11.79	2.13	5.140E-03	1764.51	15.920	7.865E-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
173.74	87.41	394.	100.	0.050	89.20	1.001	PB-214 lD
178.57	89.82	334.	78.	0.039	105.54	1.002	PB-214 lD
185.81	93.45	347.	84.	0.042	99.10	1.005	U-235 lD
418.01	209.43	506.	114.	0.057	99.13	1.082	AC-228
539.39	270.12	276.	88.	0.044	91.21	1.492	AC-228 s
599.62	300.23	239.	63.	0.031	120.97	0.905	PB-212
656.60	328.73	176.	74.	0.037	88.05	1.355	LA-140 s
1535.73	768.33	113.	75.	0.037	89.40	1.173	BI-214 M
1722.00	861.48	56.	60.	0.030	72.81	1.277	TL-208 s
1929.84	965.09	34.	39.	0.019	79.63	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	309.	108.	0.054	72.58	0.993D
PB-212	153.39	77.11	320.	166.	0.083	50.00	0.995A
RA-226	371.58	186.21	705.	116.	0.058	90.32	1.500s
PB-212	477.17	239.01	557.	1168.	0.584	13.36	0.906
RA-224	482.82	241.83	682.	132.	0.066	87.78	1.500
PB-214	482.86	241.85	664.	113.	0.057	100.50	1.500s
PB-214	589.68	295.27	262.	225.	0.113	38.07	0.980
AC-228	675.96	338.41	312.	233.	0.117	44.33	1.007
PB-214	703.13	351.99	243.	432.	0.216	23.01	1.099
SB-125	925.27	463.07	128.	75.	0.037	71.63	1.500
TL-208	1021.12	511.00	149.	143.	0.071	39.56	1.276s
TL-208	1165.67	583.29	127.	325.	0.163	23.38	1.402
BI-214	1218.01	609.46	119.	330.	0.165	23.94	1.134
BI-212	1454.47	727.70	85.	72.	0.036	71.09	1.370
CS-134	1589.63	795.28	45.	47.	0.024	74.03	1.500
AC-228	1821.80	911.39	93.	246.	0.123	29.22	1.614
AC-228	1936.81	968.90	25.	146.	0.073	28.70	1.541D
BI-214	2240.15	1120.59	82.	99.	0.049	59.05	1.595
K-40	2921.36	1461.25	48.	1079.	0.539	9.61	1.840

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
BI-214	3529.06	1765.15	7.	81.	0.041	35.38	2.132s

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		5.0198E-02					
			477.56	5.020E-02	&(	2.989E-01 8.76E-02	G
K-40		1.3454E+01					
			1460.75	1.345E+01	(P	4.378E-01 4.39E-01	G
MN-54		3.7466E-04					
			834.81	3.747E-04	&(P	3.307E-02 9.31E-03	G
CO-57		-6.8438E-04					
			122.07	-6.844E-04	%(P	4.584E-02 1.36E-02	G K
			136.43	-2.590E-02	%	4.109E-01 1.23E-01	G
CO-60		7.6844E-03					
			1332.51	7.684E-03	&(P	3.831E-02 1.09E-02	G K
			1173.23	-1.196E-02	& P	5.801E-02 1.68E-02	G K
Sr-85		-1.2361E-02					
			514.00	-1.236E-02	%(	4.826E-02 1.44E-02	G
Kr-85		-2.7009E+02					
			513.99	-2.701E+02	%(	1.056E+03 3.15E+02	G
Y-88		-1.0397E-04					
			1836.01	-1.040E-04	%(P	3.380E-02 8.88E-03	G K
			898.02	1.187E-02	% P	3.373E-02 9.99E-03	G
NB-94		-9.2273E-03					
			871.10	-9.227E-03	%(	3.609E-02 1.06E-02	G K
			702.50	-1.032E-03	%	3.263E-02 9.31E-03	G K
Ag-108M		-4.2214E-04					
			722.95	-4.221E-04	%(	4.132E-02 1.18E-02	G K
			614.37	-1.211E-02	% P	4.040E-02 1.20E-02	G
			433.93	-1.337E-03	&	3.508E-02 1.02E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CD-109	3.0438E-02						
		88.04	3.044E-02	%(	2.128E+00	6.34E-01	G
SN-113	7.2254E-03						
		391.71	7.225E-03	%(	5.384E-02	1.59E-02	G K
		255.04	5.089E-01	%	1.498E+00	4.50E-01	G
SB-125	1.1189E-01						
		427.95	9.143E-03	%(P	1.013E-01	2.96E-02	G K
		600.77	7.422E-03	% P	1.210E-01	3.41E-02	G
		636.15	-8.845E-02	% P	3.354E-01	9.91E-02	G
		463.51	4.160E-01	(P	3.085E-01	1.01E-01	G
		176.29	-3.377E-02	&	5.900E-01	1.76E-01	G
I-131	-5.8114E-04						
		364.48	-5.811E-04	&(P	6.006E-02	1.75E-02	G K
		636.97	1.547E-01	&	7.509E-01	2.21E-01	G
		284.29	-2.998E-01	% P	8.764E-01	2.63E-01	G
CS-134	2.1841E-02						
		604.66	-4.276E-04	%(	3.819E-02	1.10E-02	G K
		795.76	4.729E-02	(P	3.387E-02	1.17E-02	G
		569.29	-8.117E-02	% P	2.298E-01	6.81E-02	G
		801.84	7.162E-02	& P	3.531E-01	1.02E-01	G
CS-137	-5.4379E-03						
		661.62	-5.438E-03	%(P	3.871E-02	1.11E-02	G
CE-139	5.0117E-03						
		165.85	5.012E-03	%(	4.738E-02	1.41E-02	G
EU-152	-5.5512E-04						
		121.78	-5.551E-04	%(P	1.168E-01	3.45E-02	G K
		344.30	1.773E-04	% P	1.245E-01	3.64E-02	G
		1408.08	3.397E-03	&	1.582E-01	4.32E-02	G
		964.00	2.957E-02	% P	2.610E-01	7.48E-02	G
		1112.07	-3.890E-02	&	3.449E-01	9.96E-02	G
		778.90	-5.869E-02	%	2.603E-01	7.62E-02	G
EU-154	0.0000E+00						
		123.10	0.000E+00	&(	1.138E-01	3.39E-02	G K
		1274.80	-2.429E-02	&	1.381E-01	4.01E-02	G
		723.30	-1.133E-01	%	2.381E-01	7.22E-02	G
		1004.80	-2.845E-02	&	2.331E-01	6.72E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
EU-155	1.2597E-01						
		86.45	1.260E-01	%(	2.471E-01	7.50E-02	G K
		105.31	6.999E-02	%	2.398E-01	7.22E-02	G
HG-203	-5.2932E-03						
		279.17	-5.293E-03	&(P	4.800E-02	1.42E-02	G K
		72.87	-3.127E-01	& P	2.178E+00	6.51E-01	G
		70.83	6.130E-01	&	4.610E+00	1.38E+00	G
		82.50	-3.737E-01	&	3.720E+00	1.11E+00	G
TL-208	2.5281E-01						
		583.14	2.528E-01	(P	4.287E-02	2.00E-02	G
		510.72	3.818E-01	+ P	1.592E-01	5.98E-02	G
PB-212	9.4806E-01						
		238.63	9.246E-01	(P	8.924E-02	4.17E-02	G K
							Energy duplication
		77.11	7.427E-01	} P	3.847E-01	1.24E-01	G
		74.81	9.840E-01	(P	7.708E-01	2.45E-01	G
PB-214	5.0127E-01						
		351.99	5.191E-01	(P	9.060E-02	4.03E-02	G K
		295.22	4.589E-01	(P	1.590E-01	5.93E-02	G
							Energy duplication
		77.11	3.051E-01	} P	9.439E-01	2.27E-01	G
		241.92	5.218E-01	(	5.653E-01	1.75E-01	G
BI-212	4.8277E-01						
		727.17	4.828E-01	(P	3.080E-01	1.15E-01	G K
		1620.56	-4.283E-01	& P	1.307E+00	3.84E-01	G
		785.42	9.138E-01	%	1.656E+00	5.07E-01	G
BI-214	4.9509E-01						
		609.32	4.951E-01	(P	8.049E-02	4.03E-02	G K
		1764.51	7.865E-01	+ P	1.426E-01	9.65E-02	G
		1120.28	7.190E-01	+ P	3.287E-01	1.44E-01	G
RA-224	1.1627E+00						
		241.00	1.163E+00	(	1.094E+00	3.40E-01	G
RA-226	1.0931E+00						
		185.99	1.093E+00	(P	1.189E+00	3.66E-01	G
AC-228	8.1546E-01						
		911.07	7.994E-01	(P	1.548E-01	7.89E-02	G K
		968.90	8.255E-01	(P	1.467E-01	7.91E-02	G
		338.40	8.396E-01	(P	3.062E-01	1.25E-01	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments

TH-227      -1.9431E-01
                          236.00-1.943E-01 %(  3.942E-01 1.20E-01 G K
                          256.25-6.602E-02 % P 5.384E-01 1.60E-01 G

PA-234      -1.9785E-02
                           98.44-1.978E-02 %(P 2.344E-01 6.99E-02 G K
                          946.00 5.174E-02 % P 1.523E-01 4.51E-02 G
                          131.28-5.584E-02 % P 2.279E-01 6.84E-02 G
                           94.67-1.375E-02 % P 3.977E-01 1.18E-01 G
                          883.24 4.933E-02 &   2.468E-01 7.13E-02 G
                          926.70 0.000E+00 %   3.972E-01 1.13E-01 G
                          569.26-1.197E-01 % P 3.394E-01 1.01E-01 G

TH-234       5.5752E-01
                           63.29 5.575E-01 %(P 6.592E+00 1.96E+00 G K
                           92.80 1.254E+00 % P 2.282E+00 6.91E-01 G
                           92.38 1.523E+00 & P 2.693E+00 8.16E-01 G

AM-241       7.1059E-03
                           59.54 7.106E-03 %(P 1.024E+00 3.03E-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

- -

***** 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	4.7044E-02	5.0198E-02	2.6273E-01	2.6274E-01	2.801E-01
K-40		1.3454E+01	1.3454E+01	1.3157E+00	1.5301E+00	
MN-54	#A	3.7052E-04	3.7466E-04	2.7918E-02	2.7918E-02	3.271E-02
CO-57	#B	-6.7566E-04	-6.8438E-04	6.8160E-02	6.8160E-02	4.525E-02
CO-60	#B	7.6706E-03	7.6844E-03	3.2557E-02	3.2560E-02	3.824E-02
Sr-85	#A	-1.1718E-02	-1.2361E-02	4.3188E-02	4.3194E-02	4.575E-02
Kr-85	#A	-2.7008E+02	-2.7009E+02	9.4488E+02	9.4501E+02	1.056E+03
Y-88	#B	-1.0064E-04	-1.0397E-04	3.3559E-03	3.3559E-03	3.272E-02
NB-94	#B	-9.2273E-03	-9.2273E-03	3.1820E-02	3.1824E-02	3.609E-02
Ag-108M	#B	-4.2211E-04	-4.2214E-04	3.5511E-02	3.5511E-02	4.132E-02
CD-109	#A	3.0206E-02	3.0438E-02	1.9034E+00	1.9034E+00	2.112E+00
SN-113	#B	7.0110E-03	7.2254E-03	4.7629E-02	4.7631E-02	5.224E-02
SB-125	#F	1.1151E-01	1.1189E-01	8.1523E-02	8.1781E-02	1.009E-01
I-131	#B	-3.7762E-04	-5.8114E-04	4.8079E+00	4.8079E+00	3.903E-02
CS-134	#B	2.1740E-02	2.1841E-02	1.6199E-02	1.6248E-02	3.801E-02
CS-137	#A	-5.4362E-03	-5.4379E-03	5.2392E-02	5.2393E-02	3.870E-02
CE-139	#A	4.8869E-03	5.0117E-03	4.2384E-02	4.2385E-02	4.620E-02
EU-152	#B	-5.5470E-04	-5.5512E-04	3.1205E-01	3.1205E-01	1.167E-01
EU-154	#B	0.0000E+00	0.0000E+00	1.0158E-01	1.0158E-01	1.137E-01
EU-155	#B	1.2573E-01	1.2597E-01	2.2514E-01	2.2525E-01	2.467E-01
HG-203	#B	-4.9137E-03	-5.2932E-03	4.3057E-02	4.3058E-02	4.456E-02
TL-208		2.5281E-01	2.5281E-01	5.9901E-02	6.1672E-02	
PB-212		9.4806E-01	9.4806E-01	1.2798E-01	1.3932E-01	
PB-214		5.0127E-01	5.0127E-01	1.1686E-01	1.2043E-01	
BI-212		4.8277E-01	4.8277E-01	3.4554E-01	3.4668E-01	
BI-214		4.9509E-01	4.9509E-01	1.2085E-01	1.2422E-01	
RA-224		1.1627E+00	1.1627E+00	1.0206E+00	1.0228E+00	1.094E+00
RA-226	#A	1.0931E+00	1.0931E+00	1.0973E+00	1.0991E+00	1.189E+00
AC-228		8.1546E-01	8.1546E-01	1.6503E-01	1.7169E-01	
TH-227	#B	-1.9431E-01	-1.9431E-01	3.5892E-01	3.5909E-01	3.942E-01
PA-234	#B	-1.9785E-02	-1.9785E-02	2.4933E-01	2.4934E-01	2.344E-01
TH-234	#B	5.5752E-01	5.5752E-01	5.8791E+00	5.8791E+00	6.592E+00
AM-241	#A	7.1057E-03	7.1059E-03	9.0893E-01	9.0893E-01	1.024E+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_2AUG2006_0954.An1

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

Total Activity (1120.0 to 2000.7 keV) 1.8111816E+01 pCi/gm
Total Decayed Activity (1120.0 to 2000.7 keV) 1.8111816E+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_2AUG2006_1036.An1

Sample description
FSS-OOL-10-01-003-F

Spectrum Filename: C:\GammaVision\Spectra\103F_2AUG2006_1036.An1

Acquisition information
Start time: 02-Aug-2006 10:36:51
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: 2.0630E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 2.0630E+03) =
4.8473E+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	28-Jul-2006 07:40:00
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: 0.2688

***** 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	107.	24.39	0.99	9.052E-03	74.81	9.600	8.052E-01	PB212
77.25	174.	15.14	0.99	1.011E-02	77.11	17.500	6.806E-01	PB212
185.99	174.	24.16	1.15	2.567E-02				
185.99	174.	24.16	1.15	2.567E-02	185.99	3.280	1.249E+00	RA226
209.36	125.	23.80	1.24	2.471E-02				
238.97	945.	3.91	1.09	2.318E-02	238.63	43.100	6.111E-01	PB212
270.34	108.	28.97	0.83	2.151E-02				
295.42	240.	9.20	1.13	2.024E-02	295.22	19.200	3.977E-01	PB214
300.18	60.	29.48	1.13	2.001E-02				
328.30	58.	39.87	1.04	1.873E-02				
338.40	226.	14.66	1.13	1.830E-02	338.40	12.010	6.709E-01	AC228
351.89	440.	8.60	1.09	1.776E-02	351.99	37.100	4.315E-01	PB214
462.94	59.	34.01	0.89	1.426E-02				
462.94	59.	34.01	0.89	1.426E-02	463.51	10.000	PBC<MDA	SB125
510.91	152.	17.99	1.28	1.317E-02	510.72	22.500	2.761E-01	TL208
583.48	310.	8.39	1.20	1.184E-02	583.14	86.000	1.966E-01	TL208
609.55	335.	8.96	1.26	1.144E-02	609.32	46.090	4.077E-01	BI214
727.64	67.	23.46	1.28	9.960E-03	727.17	11.800	3.705E-01	BI212
795.03	70.	25.06	1.03	9.308E-03				
795.03	70.	25.06	1.03	9.308E-03	795.76	85.400	5.768E-02	CS134
861.17	71.	26.52	1.16	8.763E-03				
911.42	192.	11.17	1.48	8.399E-03	911.07	29.000	5.058E-01	AC228
964.46	33.	36.31	1.54	8.056E-03	964.00	14.580	PBC<MDA	EU152
969.20	179.	10.75	1.75	8.024E-03	968.90	17.460	8.342E-01	AC228
1120.80	82.	23.05	1.61	7.209E-03	1120.28	15.040	4.850E-01	BI214
1461.32	981.	3.23	1.77	5.930E-03	1460.75	10.700	9.929E+00	K40
1621.76	19.	27.42	1.07	5.488E-03	1620.56	2.750	8.098E-01	BI212

1765.09	74.	12.72	2.34	5.142E-03	1764.51	15.920	5.908E-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
417.88	209.36	347.	125.	0.063	71.41	1.238	AC-228 s
484.90	242.90	278.	73.	0.036	103.42	1.096	XE-138 lD
539.83	270.34	338.	108.	0.054	86.91	0.830	AC-228 s
599.30	300.07	159.	46.	0.023	124.43	1.038	PB-212
655.74	328.30	202.	58.	0.029	119.62	1.035	RH-106M
1721.38	861.17	76.	71.	0.036	79.57	1.158	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	307.	107.	0.053	73.17	0.993D
PB-212	153.39	77.11	316.	174.	0.087	45.42	0.995A
RA-226	371.14	185.99	628.	140.	0.070	73.02	1.500D
PB-212	477.25	239.04	465.	962.	0.481	14.14	1.022
RA-224	483.49	242.17	580.	99.	0.050	107.45	1.500
PB-214	589.78	295.32	261.	245.	0.123	36.94	1.047
AC-228	675.95	338.40	274.	225.	0.113	43.97	1.135s
PB-214	702.93	351.89	288.	434.	0.217	25.80	1.093
SB-125	925.23	463.05	140.	51.	0.026	103.97	1.500
TL-208	1020.94	510.91	206.	125.	0.062	53.96	1.275s
TL-208	1166.06	583.48	126.	306.	0.153	25.16	1.205
BI-214	1218.19	609.55	155.	328.	0.164	26.88	1.258
BI-212	1454.34	727.64	72.	67.	0.033	70.37	1.278
CS-134	1589.72	795.33	57.	40.	0.020	93.42	1.500
AC-228	1821.87	911.42	84.	188.	0.094	33.50	1.484
EU-152	1927.93	964.46	58.	33.	0.016	108.93	1.538
AC-228	1937.42	969.20	60.	178.	0.089	32.25	1.747
BI-214	2240.57	1120.80	75.	80.	0.040	69.14	1.611s
K-40	2921.51	1461.32	26.	962.	0.481	9.70	1.770
BI-212	3242.33	1621.76	2.	19.	0.009	82.26	1.069s
BI-214	3528.93	1765.09	7.	74.	0.037	38.17	2.339

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		-4.2282E-02					
			477.56	-4.228E-02	&(	2.965E-01 8.71E-02	G
K-40		9.9288E+00					
			1460.75	9.929E+00	(P	2.728E-01 3.27E-01	G
MN-54		5.2209E-04					
			834.81	5.221E-04	%(P	3.233E-02 9.21E-03	G
CO-57		-3.9709E-03					
			122.07	-3.971E-03	%(P	4.422E-02 1.32E-02	G K
			136.43	3.891E-02	&	3.453E-01 1.03E-01	G
CO-60		-2.6805E-03					
			1332.51	-2.681E-03	%(P	2.207E-02 5.35E-03	G K
			1173.23	9.369E-03	% P	3.396E-02 9.90E-03	G K
Sr-85		-1.1856E-02					
			514.00	-1.186E-02	&(	4.069E-02 1.22E-02	G
Kr-85		-2.5928E+02					
			513.99	-2.593E+02	&(	8.894E+02 2.66E+02	G
Y-88		-3.5146E-03					
			1836.01	-3.515E-03	%(P	2.203E-02 5.95E-03	G K
			898.02	9.447E-04	% P	2.804E-02 7.83E-03	G
NB-94		9.1814E-03					
			871.10	9.181E-03	%(	2.022E-02 6.11E-03	G K
			702.50	5.738E-03	%	2.875E-02 8.42E-03	G K
Ag-108M		-2.8259E-04					
			722.95	-2.826E-04	&(	3.789E-02 1.09E-02	G K
			614.37	-1.206E-02	% P	3.705E-02 1.11E-02	G
			433.93	-1.596E-03	&	2.593E-02 7.52E-03	G
CD-109		8.4589E-01					
			88.04	8.459E-01	%(	1.659E+00 5.04E-01	G
SN-113		-1.4499E-03					
			391.71	-1.450E-03	&(	4.419E-02 1.29E-02	G K
			255.04	-1.961E-01	%	1.360E+00 4.04E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	6.0446E-02						
		427.95	1.106E-03	%(P	8.283E-02	2.40E-02	G K
		600.77	2.319E-02	& P	1.375E-01	4.01E-02	G
		636.15	-1.562E-02	& P	2.331E-01	6.66E-02	G
		463.51	2.361E-01	(P	2.671E-01	8.39E-02	G
		176.29	-4.208E-02	%	4.862E-01	1.45E-01	G
I-131	2.1236E-03						
		364.48	2.124E-03	&(P	4.023E-02	1.17E-02	G K
		636.97	1.351E-02	&	6.090E-01	1.75E-01	G
		284.29	-6.489E-02	% P	6.963E-01	2.06E-01	G
CS-134	1.6560E-02						
		604.66	2.226E-03	%(	2.530E-02	7.29E-03	G K
		795.76	3.294E-02	(P	3.143E-02	1.03E-02	G
		569.29	-3.913E-02	% P	1.859E-01	5.42E-02	G
		801.84	-1.334E-02	% P	3.940E-01	1.12E-01	G
CS-137	1.1302E-02						
		661.62	1.130E-02	%(P	3.426E-02	1.02E-02	G
CE-139	4.9075E-03						
		165.85	4.907E-03	%(	4.073E-02	1.22E-02	G
EU-152	5.3234E-02						
		121.78	-1.181E-02	&(P	1.281E-01	3.82E-02	G K
		344.30	-2.765E-02	% P	1.032E-01	3.08E-02	G
		1408.08	6.863E-02	%	1.045E-01	3.33E-02	G
		964.00	1.837E-01	(P	2.125E-01	6.78E-02	G
		1112.07	7.675E-02	&	1.942E-01	5.80E-02	G
		778.90	1.163E-02	&	1.721E-01	4.85E-02	G
EU-154	-7.0500E-03						
		123.10	-7.050E-03	%(	8.618E-02	2.57E-02	G K
		1274.80	2.419E-02	%	7.660E-02	2.25E-02	G
		723.30	-2.980E-02	&	1.001E-01	2.94E-02	G
		1004.80	-2.081E-02	%	1.507E-01	4.30E-02	G
EU-155	-9.0773E-03						
		86.45	-9.077E-03	%(	2.150E-01	6.42E-02	G K
		105.31	6.439E-02	%	1.929E-01	5.81E-02	G
HG-203	1.9453E-02						
		279.17	1.945E-02	&(P	3.306E-02	1.01E-02	G K
		72.87	-3.837E-01	& P	2.030E+00	6.09E-01	G
		70.83	-4.222E-01	%	3.702E+00	1.11E+00	G
		82.50	-7.579E-05	%	3.515E+00	1.05E+00	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments

TL-208       1.9658E-01
                          583.14 1.966E-01  (P 3.542E-02 1.67E-02 G
                          510.72 2.761E-01 + P 1.538E-01 6.03E-02 G

PB-212       6.4479E-01
                          238.63 6.303E-01  (P 6.761E-02 3.01E-02 G K
                                                          Energy duplication
                           77.11 6.448E-01 } P 3.166E-01 9.76E-02 G
                           74.81 8.052E-01 + P 6.363E-01 2.02E-01 G

PB-214       4.2526E-01
                          351.99 4.315E-01  (P 8.137E-02 3.76E-02 G K
                          295.22 4.132E-01  (P 1.314E-01 5.17E-02 G
                                                          Energy duplication
                           77.11 9.116E-02 } P 5.578E-01 1.11E-01 G
                          241.92 3.213E-01 %   4.523E-01 1.39E-01 G

BI-212       3.7049E-01
                          727.17 3.705E-01  (P 2.361E-01 8.76E-02 G K
                         1620.56 8.098E-01 + P 4.274E-01 2.23E-01 G
                          785.42 7.512E-01 %   1.352E+00 4.15E-01 G

BI-214       4.2669E-01
                          609.32 4.077E-01  (P 7.542E-02 3.73E-02 G K
                         1764.51 5.908E-01 + P 1.216E-01 7.85E-02 G
                         1120.28 4.850E-01  (P 2.596E-01 1.14E-01 G

RA-224       7.2140E-01
                          241.00 7.214E-01 &(  8.369E-01 2.58E-01 G

RA-226       1.0879E+00
                                                          Energy duplication
                          185.99 1.088E+00 @(P 9.297E-01 2.89E-01 G

AC-228       5.5415E-01
                          911.07 5.058E-01  (P 1.220E-01 5.75E-02 G K
                          968.90 8.342E-01 + P 1.808E-01 8.98E-02 G
                          338.40 6.709E-01 @(P 2.379E-01 9.88E-02 G

TH-227      -2.9373E-03
                          236.00-2.937E-03 %(  3.075E-01 9.13E-02 G K
                          256.25-7.440E-02 % P 4.166E-01 1.24E-01 G

PA-234      -1.4144E-03
                           98.44-1.414E-03 %(P 1.924E-01 5.72E-02 G K
                          946.00 3.378E-02 % P 1.379E-01 4.03E-02 G
                          131.28 5.633E-02 & P 1.655E-01 4.99E-02 G
                           94.67-1.499E-01 & P 3.624E-01 1.10E-01 G
                          883.24-1.228E-02 &   2.322E-01 6.58E-02 G
                          926.70 7.259E-02 &   2.377E-01 7.01E-02 G
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 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26-5.781E-02 % P 2.745E-01 8.00E-02 G

TH-234       8.3595E-01
                           63.29 8.360E-01 %(P 5.129E+00 1.53E+00 G K
                           92.80 7.080E-01 % P 1.872E+00 5.63E-01 G
                           92.38 8.907E-01 & P 2.220E+00 6.68E-01 G

AM-241      -1.7804E-01
                           59.54-1.780E-01 &(P 9.607E-01 2.87E-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	-3.9562E-02	-4.2282E-02	2.6145E-01	2.6146E-01	2.774E-01
K-40		9.9288E+00	9.9288E+00	9.8163E-01	1.1384E+00	
MN-54	#A	5.1619E-04	5.2209E-04	2.7640E-02	2.7640E-02	3.196E-02
CO-57	#B	-3.9190E-03	-3.9709E-03	4.2529E-02	4.2530E-02	4.365E-02
CO-60	#B	-2.6756E-03	-2.6805E-03	1.5632E+00	1.5632E+00	2.203E-02

Sr-85	#A	-1.1224E-02	-1.1856E-02	3.6522E-02	3.6528E-02	3.852E-02
Kr-85	#A	-2.5927E+02	-2.5928E+02	7.9827E+02	7.9841E+02	8.894E+02
Y-88	#B	-3.3995E-03	-3.5146E-03	1.8738E-02	1.8739E-02	2.131E-02
NB-94	#B	9.1814E-03	9.1814E-03	1.8334E-02	1.8342E-02	2.022E-02
Ag-108M	#B	-2.8257E-04	-2.8259E-04	3.2741E-02	3.2741E-02	3.789E-02
CD-109	#A	8.3929E-01	8.4589E-01	1.5117E+00	1.5125E+00	1.647E+00
SN-113	#B	-1.4058E-03	-1.4499E-03	3.8747E-02	3.8747E-02	4.285E-02
SB-125	#B	6.0234E-02	6.0446E-02	6.4411E-02	6.4506E-02	8.254E-02
I-131	#B	1.3654E-03	2.1236E-03	3.4991E-02	3.4991E-02	2.587E-02
CS-134	#B	1.6482E-02	1.6560E-02	1.5504E-02	1.5534E-02	2.518E-02
CS-137	#A	1.1298E-02	1.1302E-02	3.0529E-02	3.0536E-02	3.425E-02
CE-139	#A	4.7824E-03	4.9075E-03	3.6483E-02	3.6484E-02	3.969E-02
EU-152	#B	5.3193E-02	5.3234E-02	5.8949E-02	5.9023E-02	1.280E-01
EU-154	#B	-7.0419E-03	-7.0500E-03	7.7051E-02	7.7052E-02	8.608E-02
EU-155	#B	-9.0595E-03	-9.0773E-03	1.9253E-01	1.9254E-01	2.146E-01
HG-203	#B	1.8026E-02	1.9453E-02	3.0298E-02	3.0319E-02	3.064E-02
TL-208		1.9658E-01	1.9658E-01	5.0158E-02	5.1440E-02	
PB-212		6.4479E-01	6.4479E-01	9.2285E-02	9.9589E-02	
PB-214		4.2526E-01	4.2526E-01	9.7279E-02	1.0036E-01	
BI-212		3.7049E-01	3.7049E-01	2.6266E-01	2.6354E-01	
BI-214		4.2669E-01	4.2669E-01	1.1694E-01	1.1953E-01	
RA-224	#A	7.2140E-01	7.2140E-01	7.7512E-01	7.7625E-01	8.369E-01
RA-226	#	1.0879E+00	1.0879E+00	8.6802E-01	8.7031E-01	9.297E-01
AC-228		5.5415E-01	5.5415E-01	1.5463E-01	1.5795E-01	
TH-227	#B	-2.9373E-03	-2.9373E-03	2.7392E-01	2.7392E-01	3.075E-01
PA-234	#B	-1.4144E-03	-1.4144E-03	3.3979E-01	3.3979E-01	1.924E-01
TH-234	#B	8.3595E-01	8.3595E-01	4.5855E+00	4.5858E+00	5.129E+00
AM-241	#A	-1.7803E-01	-1.7804E-01	8.7772E-01	8.7777E-01	9.607E-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) 1.2546716E+01 pCi/gm
Total Decayed Activity (87.4 to 2000.7 keV) 1.2546716E+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_31JULY2006_1537.An1

Sample description
OOL-10-01-017-F-S WET

Spectrum Filename: C:\GammaVision\Spectra\107_31JULY2006_1537.An1

Acquisition information
Start time: 31-Jul-2006 15:38:16
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: 1.9300E+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	28-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. 17 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.2595

***** 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	248.	24.71	1.50	2.849E-02				
74.85	248.	24.71	1.50	2.849E-02	74.81	9.600	6.355E-01	PB212
77.08	479.	12.38	1.50	2.957E-02	77.11	10.700	1.059E+00	PB214
					77.11	17.500	6.477E-01	PB212
77.08	483.	12.38	1.50	2.957E-02	77.11	10.700	1.059E+00	PB214
					77.11	17.500	6.541E-01	PB212
87.73	147.	26.47	1.19	3.328E-02	86.45	32.740	9.601E-02	EU155
89.55	121.	32.97	1.19	3.373E-02				
92.89	238.	15.34	1.19	3.448E-02	92.38	2.570	1.829E+00	TH234
					92.80	3.000	1.483E+00	TH234
185.98	179.	27.49	1.61	3.610E-02	185.99	3.280	1.057E+00	RA226
209.25	101.	30.43	1.23	3.429E-02				
238.83	1199.	3.65	1.30	3.187E-02	238.63	43.100	6.028E-01	PB212
241.56	258.	16.65	1.30	3.165E-02	241.00	3.900	1.450E+00	RA224
					241.92	7.470	7.614E-01	PB214
270.90	163.	24.70	1.33	2.940E-02				
295.39	276.	9.07	1.34	2.767E-02	295.22	19.200	3.575E-01	PB214
300.51	79.	24.95	1.34	2.732E-02				
338.54	238.	16.73	1.35	2.500E-02	338.40	12.010	5.470E-01	AC228
352.14	583.	6.12	1.28	2.425E-02	351.99	37.100	4.499E-01	PB214
463.69	75.	23.94	1.14	1.952E-02	463.51	10.000	2.598E-01	SB125
511.03	195.	13.71	1.66	1.807E-02	510.72	22.500	2.780E-01	TL208
583.58	492.	6.14	1.33	1.628E-02	583.14	86.000	2.436E-01	TL208
609.60	484.	7.27	1.69	1.574E-02	609.32	46.090	4.627E-01	BI214
727.38	122.	19.17	1.69	1.374E-02	727.17	11.800	5.234E-01	BI212
768.46	74.	33.24	1.19	1.318E-02				
795.43	62.	29.39	0.98	1.284E-02				

795.43	62.	29.39	0.98	1.284E-02	795.76	85.400	3.937E-02	CS134
860.57	70.	30.12	1.17	1.211E-02				
911.52	313.	9.49	1.58	1.160E-02	911.07	29.000	6.418E-01	AC228
964.94	87.	15.88	1.80	1.112E-02	964.00	14.580	3.765E-01	EU152
969.46	164.	9.90	1.80	1.109E-02	968.90	17.460	5.832E-01	AC228
1120.84	147.	19.92	1.20	9.966E-03	1120.28	15.040	6.809E-01	BI214
1461.34	1617.	2.58	2.23	8.188E-03	1460.75	10.700	1.288E+01	K40

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
1765.56	82.	11.04	1.00	7.080E-03	1764.51	15.920	5.036E-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	
175.11	88.09	696.	137.	0.068	85.92	1.187	PB-214	D
178.77	89.92	739.	112.	0.056	106.56	1.189	PB-214	D
185.44	93.26	550.	237.	0.118	46.34	1.191	U-235	D
418.14	209.25	399.	101.	0.050	91.30	1.228	AC-228	
477.29	238.88	356.	1199.	0.600	10.94	1.297	PB-212	D
482.76	241.62	796.	258.	0.129	49.94	1.299	PB-214	D
541.43	270.90	486.	163.	0.082	74.10	1.328	AC-228	s
600.58	300.48	164.	65.	0.033	89.27	1.030	PB-212	s
1536.48	768.46	143.	74.	0.037	77.03	1.186	BI-214	M
1720.70	860.57	104.	70.	0.035	90.35	1.169	TL-208	s
1930.53	965.11	58.	82.	0.041	51.18	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	149.38	74.85	1819.	248.	0.124	74.13	1.500s
PB-214	153.89	77.11	1555.	479.	0.239	37.14	1.500D
PB-212	153.89	77.11	1550.	483.	0.242	37.14	1.500D
EU-155	174.38	87.36	1428.	155.	0.077	106.28	1.500
TH-234	185.58	92.96	1375.	196.	0.098	75.14	1.500
RA-226	371.60	185.98	799.	179.	0.089	82.48	1.606s
PB-212	477.27	238.82	830.	1122.	0.561	13.87	1.500s
RA-224	482.79	241.58	1042.	136.	0.068	102.20	1.500
PB-214	590.40	295.39	345.	269.	0.134	33.90	1.500s
AC-228	676.67	338.53	471.	254.	0.127	50.70	1.363
PB-214	703.81	352.10	253.	549.	0.275	17.54	1.500
SB-125	926.01	463.21	137.	62.	0.031	85.14	1.500s
TL-208	1021.66	511.03	196.	162.	0.081	41.13	1.663s
TL-208	1166.75	583.58	125.	487.	0.244	18.41	1.325
BI-214	1218.79	609.60	184.	479.	0.240	21.80	1.691s
Ag-108M	1223.77	612.09	282.	-83.	-0.042	91.66	1.561s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
BI-212	1454.23	727.33	125.	130.	0.065	55.73	1.703s
CS-134	1590.27	795.35	77.	41.	0.020	101.19	1.684s
AC-228	1822.61	911.52	133.	309.	0.154	28.47	1.578
AC-228	1937.36	968.90	75.	160.	0.080	32.35	1.799D
BI-214	2241.26	1120.84	145.	146.	0.073	59.75	1.201s
K-40	2922.27	1461.34	36.	1612.	0.806	7.75	2.227
BI-214	3530.77	1765.56	1.	81.	0.041	33.13	1.000s

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		-2.9218E-03					
			477.56	-2.922E-03	%(	2.257E-01 6.55E-02	G
K-40		1.2880E+01					
			1460.75	1.288E+01	(P	2.442E-01 3.34E-01	G
MN-54		1.2161E-02					
			834.81	1.216E-02	&(P	2.274E-02 6.94E-03	G
CO-57		-4.5227E-04					
			122.07	-4.523E-04	%(P	2.977E-02 8.86E-03	G K
			136.43	-2.574E-02	& P	2.622E-01 7.84E-02	G
CO-60		-1.8926E-03					
			1332.51	-1.893E-03	&(P	3.067E-02 8.42E-03	G K
			1173.23	-2.721E-03	& P	3.615E-02 1.02E-02	G K
Sr-85		-1.1637E-02					
			514.00	-1.164E-02	%(	3.173E-02 9.55E-03	G
Kr-85		-2.8656E+02					
			513.99	-2.866E+02	%(P	7.113E+02 2.13E+02	G
Y-88		-2.5367E-03					
			1836.01	-2.537E-03	%(P	1.584E-02 3.94E-03	G K
			898.02	5.018E-03	% P	3.019E-02 8.78E-03	G
NB-94		6.7969E-03					
			871.10	6.797E-03	%(P	2.245E-02 6.63E-03	G K
			702.50	7.110E-03	% P	2.470E-02 7.32E-03	G K

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
Ag-108M	2.3730E-03						
		722.95	2.373E-03	&(	2.946E-02	8.56E-03	G K
		614.37	-4.121E-02	+	4.007E-02	1.26E-02	G
		433.93	3.712E-03	% P	2.371E-02	6.97E-03	G
CD-109	-3.8697E-01						
		88.04	-3.870E-01	%(P	1.071E+00	3.24E-01	G
SN-113	1.2306E-02						
		391.71	1.231E-02	%(P	3.380E-02	1.01E-02	G K
		255.04	-1.549E-01	&	1.201E+00	3.58E-01	G
SB-125	6.6463E-02						
		427.95	1.425E-02	%(P	7.094E-02	2.09E-02	G K
		600.77	-3.228E-02	% P	1.383E-01	4.07E-02	G
		636.15	3.861E-03	% P	2.069E-01	5.95E-02	G
		463.51	2.210E-01	*(P	2.059E-01	6.56E-02	G
		176.29	4.294E-02	% P	4.174E-01	1.25E-01	G
I-131	-1.2193E-02						
		364.48	-1.219E-02	&(	3.921E-02	1.18E-02	G K
		636.97	3.359E-02	%	3.528E-01	1.02E-01	G
		284.29	2.193E-04	%	3.998E-01	1.17E-01	G
CS-134	1.1500E-02						
		604.66	-1.241E-03	%(P	5.701E-02	1.69E-02	G K
		795.76	2.606E-02	(P	2.785E-02	8.90E-03	G
		569.29	-2.682E-02	%	1.646E-01	4.85E-02	G
		801.84	-6.343E-03	& P	3.020E-01	8.65E-02	G
CS-137	1.3180E-02						
		661.62	1.318E-02	%(P	3.100E-02	9.29E-03	G
CE-139	6.1167E-03						
		165.85	6.117E-03	%(P	3.235E-02	9.70E-03	G
EU-152	-2.1320E-03						
		121.78	-2.132E-03	%(P	9.041E-02	2.69E-02	G K
		344.30	-1.588E-03	& P	8.968E-02	2.63E-02	G
		1408.08	2.093E-02	% P	1.071E-01	3.05E-02	G
		964.00	3.387E-02	& P	3.391E-01	1.00E-01	G
		1112.07	5.305E-02	% P	2.208E-01	6.48E-02	G
		778.90	-1.431E-02	% P	1.920E-01	5.52E-02	G
EU-154	-1.1065E-02						
		123.10	-1.107E-02	%(P	7.125E-02	2.14E-02	G K
		1274.80	3.719E-03	% P	9.496E-02	2.71E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
		723.30	1.851E-03	& P	2.425E-01	7.15E-02	G
		1004.80	-1.183E-02	& P	1.743E-01	5.02E-02	G
EU-155	1.0100E-01						
		86.45	1.010E-01	&(	1.166E-01	3.58E-02	G K
		105.31	2.490E-02	& P	1.358E-01	4.08E-02	G
HG-203	1.6201E-02						
		279.17	1.620E-02	%(P	2.648E-02	8.09E-03	G K
		72.87	-5.757E-01	& P	9.330E-01	2.84E-01	G
		70.83	-9.199E-01	%	1.518E+00	4.62E-01	G
		82.50	-5.627E-02	%	1.681E+00	5.02E-01	G
TL-208	2.5077E-01						
		583.14	2.436E-01	(P	2.735E-02	1.51E-02	G
		510.72	2.780E-01	*(P	1.171E-01	4.61E-02	G
PB-212	6.0083E-01						
		238.63	5.715E-01	*(P	6.976E-02	2.68E-02	G K
							Energy duplication
		77.11	6.541E-01	*(	2.519E-01	8.10E-02	G
		74.81	6.355E-01	&(P	5.156E-01	1.59E-01	G
PB-214	4.2720E-01						
		351.99	4.272E-01	(P	5.974E-02	2.52E-02	G K
		295.22	3.544E-01	- P	1.177E-01	4.07E-02	G
							Energy duplication
		77.11	1.059E+00	+ P	4.126E-01	1.32E-01	G
		241.92	1.516E-01	% P	4.777E-01	1.44E-01	G
BI-212	5.5920E-01						
		727.17	5.592E-01	@(P	2.371E-01	1.05E-01	G K
		1620.56	8.454E-02	% P	6.653E-01	1.81E-01	G
		785.42	5.125E-01	% P	1.307E+00	3.91E-01	G
BI-214	4.7320E-01						
		609.32	4.627E-01	@(P	6.354E-02	3.39E-02	G K
		1764.51	5.036E-01	(P	4.576E-02	5.63E-02	G
		1120.28	6.809E-01	+ P	2.748E-01	1.36E-01	G
RA-224	7.7026E-01						
		241.00	7.703E-01	?(P	8.673E-01	2.67E-01	G
RA-226	1.0573E+00						
		185.99	1.057E+00	(	7.950E-01	2.91E-01	G
AC-228	6.1320E-01						
		911.07	6.418E-01	(P	1.176E-01	6.18E-02	G K
		968.90	5.797E-01	(P	1.554E-01	6.34E-02	G
		338.40	5.929E-01	(P	2.421E-01	1.01E-01	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments

TH-227      -8.8230E-03
                          236.00-8.823E-03 %(P 3.189E-01 9.52E-02 G K
                          256.25 4.720E-02 % P 3.412E-01 1.01E-01 G

PA-234       3.6708E-04
                           98.44 3.671E-04 &(  1.211E-01 3.61E-02 G K
                          946.00-2.647E-02 %   1.557E-01 4.56E-02 G
                          131.28 9.215E-03 %   1.371E-01 4.09E-02 G
                           94.67-8.593E-02 %   2.284E-01 6.91E-02 G
                          883.24 8.378E-02 %   1.927E-01 5.81E-02 G
                          926.70-2.307E-02 %   2.374E-01 6.84E-02 G
                          569.26-3.975E-02 %   2.435E-01 7.17E-02 G

TH-234       7.5913E-01
                           63.29 3.183E-01 %(P 1.478E+00 4.43E-01 G K
                           92.80 1.332E+00  (P 1.191E+00 3.67E-01 G
                           92.38-5.489E-02 % P 1.418E+00 4.23E-01 G

AM-241       6.3775E-03
                           59.54 6.378E-03 &(P 1.627E-01 4.85E-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	-2.8013E-03	-2.9218E-03	1.9657E-01	1.9657E-01	2.164E-01
K-40		1.2880E+01	1.2880E+01	1.0009E+00	1.2572E+00	
MN-54	#A	1.2074E-02	1.2161E-02	2.0818E-02	2.0830E-02	2.257E-02
CO-57	#B	-4.4851E-04	-4.5227E-04	3.4708E-02	3.4708E-02	2.953E-02
CO-60	#B	-1.8904E-03	-1.8926E-03	1.1111E-01	1.1111E-01	3.064E-02
Sr-85	#A	-1.1240E-02	-1.1637E-02	2.8636E-02	2.8644E-02	3.064E-02
Kr-85	#A	-2.8655E+02	-2.8656E+02	7.7182E+02	7.7200E+02	7.113E+02
Y-88	#B	-2.4837E-03	-2.5367E-03	2.3796E-02	2.3796E-02	1.550E-02
NB-94	#B	6.7969E-03	6.7969E-03	1.9904E-02	1.9908E-02	2.245E-02
Ag-108M	#B	2.3729E-03	2.3730E-03	2.5677E-02	2.5677E-02	2.946E-02
CD-109	#A	-3.8505E-01	-3.8697E-01	9.8010E-01	9.8033E-01	1.066E+00
SN-113	#B	1.2068E-02	1.2306E-02	3.0395E-02	3.0403E-02	3.314E-02
SB-125	#B	6.6316E-02	6.6463E-02	5.9178E-02	5.9308E-02	7.078E-02
I-131	#B	-9.2169E-03	-1.2193E-02	3.5269E-02	3.5276E-02	2.964E-02
CS-134	#B	1.1465E-02	1.1500E-02	1.1787E-02	1.1807E-02	5.684E-02
CS-137	#A	1.3177E-02	1.3180E-02	2.7871E-02	2.7882E-02	3.099E-02
CE-139	#A	6.0174E-03	6.1167E-03	2.9086E-02	2.9088E-02	3.182E-02
EU-152	#B	-2.1309E-03	-2.1320E-03	8.7723E-02	8.7723E-02	9.037E-02
EU-154	#B	-1.1057E-02	-1.1065E-02	6.6998E-02	6.7001E-02	7.120E-02
EU-155	#A	1.0087E-01	1.0100E-01	1.0734E-01	1.0749E-01	1.164E-01
HG-203	#B	1.5437E-02	1.6201E-02	2.4273E-02	2.4292E-02	2.523E-02
TL-208		2.5077E-01	2.5077E-01	4.6607E-02	4.8903E-02	
PB-212	#	6.0083E-01	6.0083E-01	8.4493E-02	9.1643E-02	6.976E-02
PB-214	#	4.2720E-01	4.2720E-01	7.5610E-02	7.9708E-02	5.974E-02
BI-212	#	5.5920E-01	5.5920E-01	3.1472E-01	3.1645E-01	
BI-214		4.7320E-01	4.7320E-01	9.4817E-02	9.8850E-02	
RA-224	#A	7.7026E-01	7.7026E-01	8.0012E-01	8.0141E-01	8.673E-01
RA-226		1.0572E+00	1.0573E+00	8.7203E-01	8.7426E-01	
AC-228		6.1320E-01	6.1320E-01	1.3780E-01	1.4248E-01	
TH-227	#B	-8.8230E-03	-8.8230E-03	3.2245E-01	3.2245E-01	3.189E-01
PA-234	#B	3.6708E-04	3.6708E-04	1.0836E-01	1.0836E-01	1.211E-01
TH-234	#B	7.5913E-01	7.5913E-01	6.2771E-01	6.2912E-01	1.478E+00
AM-241	#A	6.3774E-03	6.3775E-03	1.4537E-01	1.4537E-01	1.627E-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) 1.5834046E+01 pCi/gm
Total Decayed Activity (1120.2 to 2000.1 keV) 1.5834050E+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_1AUG2006_1528.An1

Sample description
FSS-OOL-10-01-022-F

Spectrum Filename: C:\GammaVision\Spectra\107F_1AUG2006_1528.An1

Acquisition information
Start time: 01-Aug-2006 15:28:24
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: 2.0560E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 2.0560E+03) =
4.8638E+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	28-Jul-2006 09:46:00
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: 0.1824

***** 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	287.	15.65	1.18	2.862E-02	74.81	9.600	6.803E-01	PB212
77.22	523.	8.31	1.18	2.977E-02	77.11	17.500	6.647E-01	PB212
					77.11	10.700	1.077E+00	PB214
87.29	219.	27.95	1.47	3.307E-02	86.45	32.740	1.343E-01	EU155
					88.04	3.790	1.150E+00	CD109
93.27	178.	27.33	2.02	3.448E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
128.97	179.	28.94	0.82	3.818E-02				
128.97	179.	28.94	0.82	3.818E-02	131.28	20.000	1.542E-01	PA234
185.92	304.	17.44	2.43	3.611E-02	185.99	3.280	1.685E+00	RA226
209.67	112.	35.00	1.27	3.425E-02				
238.83	1111.	3.89	1.30	3.186E-02	238.63	43.100	5.238E-01	PB212
241.36	194.	21.89	1.30	3.166E-02	241.00	3.900	1.021E+00	RA224
					241.92	7.470	5.366E-01	PB214
270.25	137.	25.52	1.50	2.944E-02				
295.43	284.	8.75	1.34	2.768E-02	295.22	19.200	3.453E-01	PB214
300.68	56.	34.62	1.34	2.733E-02				
328.59	92.	27.55	1.50	2.557E-02				
338.37	340.	12.79	1.47	2.500E-02	338.40	12.010	7.376E-01	AC228
352.13	608.	6.36	1.64	2.425E-02	351.99	37.100	4.402E-01	PB214
463.18	77.	31.79	0.81	1.954E-02				
463.18	77.	31.79	0.81	1.954E-02	463.51	10.000	2.504E-01	SB125
511.00	211.	14.89	1.80	1.807E-02	510.72	22.500	2.872E-01	TL208
583.51	404.	6.48	1.78	1.628E-02	583.14	86.000	1.875E-01	TL208
609.59	469.	5.96	1.57	1.574E-02	609.32	46.090	4.211E-01	BI214
665.07	62.	29.84	1.64	1.471E-02				
727.69	109.	17.02	1.65	1.374E-02	727.17	11.800	4.378E-01	BI212

785.05	70.	26.22	1.12	1.297E-02				
785.05	70.	26.22	1.12	1.297E-02	785.42	2.000	1.755E+00	BI212
795.26	61.	27.87	0.98	1.285E-02				
795.26	61.	27.87	0.98	1.285E-02	795.76	85.400	3.639E-02	CS134
911.63	316.	7.16	2.02	1.160E-02	911.07	29.000	6.095E-01	AC228
934.39	46.	30.95	1.67	1.139E-02				
964.83	49.	23.36	1.80	1.112E-02	964.00	14.580	PBC<MDA	EU152
969.18	167.	9.33	1.80	1.109E-02	968.90	17.460	5.578E-01	AC228
1120.90	138.	19.81	2.23	9.966E-03	1120.28	15.040	6.015E-01	BI214

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
1461.39	1708.	2.48	2.12	8.188E-03	1460.75	10.700	1.277E+01	K40
1765.46	86.	11.74	2.06	7.084E-03	1764.51	15.920	4.984E-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
257.60	128.97	933.	178.	0.089	76.20	0.821	AC-228
418.97	209.67	570.	112.	0.056	105.01	1.268	NP-239
540.12	270.25	405.	137.	0.069	76.57	1.499	AC-228 s
600.55	300.46	161.	54.	0.027	105.60	0.986	PB-212 M
656.80	328.59	218.	92.	0.046	82.64	1.500	RH-106M s
1329.71	665.07	101.	62.	0.031	78.63	1.640	BI-214
1569.67	785.05	93.	55.	0.028	84.19	1.117	BI-212 sM
1868.34	934.39	60.	46.	0.023	83.00	1.674	BI-214
1930.19	965.08	41.	49.	0.024	70.44	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	742.	292.	0.146	42.67	1.178D
PB-212	153.89	77.11	784.	325.	0.163	35.15	1.179A
PB-214	153.89	77.11	1414.	190.	0.095	78.05	1.500A
EU-155	174.13	87.23	1496.	195.	0.098	86.74	1.500s
CD-109	174.08	87.21	1383.	186.	0.093	87.42	1.500s
TH-234	185.90	93.12	1416.	175.	0.087	89.92	1.500s
TH-234	185.83	93.08	1369.	165.	0.083	87.01	1.500s
RA-226	371.47	185.92	806.	304.	0.152	52.32	2.430s
PB-212	476.89	238.63	338.	1097.	0.548	11.31	1.297D
RA-224	483.05	241.71	965.	115.	0.058	115.20	1.500
PB-214	483.47	241.92	488.	177.	0.089	57.02	1.299D
PB-214	590.08	295.23	405.	381.	0.190	32.56	1.301
AC-228	676.36	338.37	412.	337.	0.168	38.37	1.467s
PB-214	703.88	352.13	274.	603.	0.301	19.09	1.641
TL-208	1021.60	511.00	244.	178.	0.089	44.67	1.800s
TL-208	1166.61	583.51	101.	400.	0.200	19.43	1.778
BI-214	1218.76	609.59	105.	465.	0.232	17.88	1.566s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
BI-212	1454.95	727.69	83.	108.	0.054	51.07	1.654
CS-134	1590.03	795.23	63.	48.	0.024	81.41	1.684s
AC-228	1822.82	911.63	66.	312.	0.156	21.49	2.016s
AC-228	1937.36	968.90	52.	164.	0.082	29.35	1.799D
BI-214	2241.36	1120.90	143.	137.	0.069	59.42	2.233s
K-40	2922.38	1461.39	24.	1703.	0.852	7.43	2.123
BI-214	3530.57	1765.46	4.	86.	0.043	35.23	2.055s

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		6.1447E-03					
			477.56	6.145E-03	&(	2.139E-01 6.22E-02	G
K-40		1.2772E+01					
			1460.75	1.277E+01	(P	1.913E-01 3.17E-01	G
MN-54		-8.6875E-03					
			834.81	-8.687E-03	&(P	2.724E-02 8.10E-03	G
CO-57		-8.9730E-03					
			122.07	-8.973E-03	&(P	2.933E-02 8.83E-03	G K
			136.43	5.503E-02	% P	2.482E-01 7.46E-02	G
CO-60		1.0021E-02					
			1332.51	1.002E-02	%(P	2.300E-02 6.77E-03	G K
			1173.23	-1.105E-02	% P	2.969E-02 8.55E-03	G K
Sr-85		-1.2946E-02					
			514.00	-1.295E-02	%(	3.185E-02 9.61E-03	G
Kr-85		-3.0261E+02					
			513.99	-3.026E+02	%(P	7.043E+02 2.11E+02	G
Y-88		-3.3477E-03					
			1836.01	-3.348E-03	%(P	2.190E-02 5.91E-03	G K
			898.02	-4.785E-03	% P	2.825E-02 8.14E-03	G
NB-94		-7.4493E-05					
			871.10	-7.449E-05	%(P	2.850E-02 8.19E-03	G K
			702.50	4.552E-03	% P	2.556E-02 7.51E-03	G K

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
Ag-108M	-6.1061E-04						
		722.95	-6.106E-04	%(	4.886E-02	1.44E-02	G K
		614.37	-1.830E-02	%	3.226E-02	9.85E-03	G
		433.93	2.759E-03	% P	1.856E-02	5.41E-03	G
CD-109	9.7677E-01						
		88.04	9.768E-01	(P	9.236E-01	2.85E-01	G
SN-113	1.6863E-03						
		391.71	1.686E-03	%(P	3.162E-02	9.23E-03	G K
		255.04	-8.060E-02	&	1.029E+00	3.05E-01	G
SB-125	1.8603E-02						
		427.95	1.860E-02	%(P	6.710E-02	1.99E-02	G K
		600.77	-7.549E-03	& P	1.203E-01	3.46E-02	G
		636.15	-1.964E-02	% P	1.915E-01	5.54E-02	G
		463.51	1.433E-01	% P	2.021E-01	6.23E-02	G
		176.29	-2.816E-02	& P	3.840E-01	1.14E-01	G
I-131	-5.4389E-03						
		364.48	-5.439E-03	&(	3.710E-02	1.10E-02	G K
		636.97	-6.329E-02	%	4.164E-01	1.22E-01	G
		284.29	-7.544E-02	%	5.009E-01	1.49E-01	G
CS-134	1.4701E-02						
		604.66	2.358E-03	%(P	2.515E-02	7.34E-03	G K
		795.76	2.881E-02	@(P	2.381E-02	7.90E-03	G
		569.29	4.516E-02	%	1.408E-01	4.20E-02	G
		801.84	2.603E-02	& P	2.915E-01	8.45E-02	G
CS-137	3.7511E-03						
		661.62	3.751E-03	&(P	2.563E-02	7.41E-03	G
CE-139	-9.2653E-03						
		165.85	-9.265E-03	%(P	3.214E-02	9.67E-03	G
EU-152	-1.5706E-02						
		121.78	-1.571E-02	%(P	9.276E-02	2.78E-02	G K
		344.30	-2.285E-02	& P	8.702E-02	2.60E-02	G
		1408.08	4.516E-02	& P	1.016E-01	3.05E-02	G
		964.00	1.501E-02	% P	2.646E-01	7.74E-02	G
		1112.07	-2.008E-02	% P	2.542E-01	7.36E-02	G
		778.90	-6.593E-02	% P	1.996E-01	5.94E-02	G
EU-154	1.8536E-02						
		123.10	1.854E-02	%(P	6.626E-02	2.00E-02	G K
		1274.80	2.346E-02	% P	8.225E-02	2.43E-02	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          723.30-7.252E-02 % P 1.551E-01 4.69E-02 G
                         1004.80-3.796E-02 % P 1.598E-01 4.70E-02 G

EU-155       1.1956E-01
                           86.45 1.196E-01  (  1.120E-01 3.46E-02 G K
                          105.31 1.676E-02 & P 1.332E-01 3.99E-02 G

HG-203      -4.9468E-04
                          279.17-4.947E-04 &(P 2.706E-02 7.95E-03 G K
                           72.87-1.689E-01 & P 8.787E-01 2.65E-01 G
                           70.83-8.991E-01 %   1.465E+00 4.46E-01 G
                           82.50-4.346E-01 %   1.788E+00 5.38E-01 G

TL-208       1.8746E-01
                          583.14 1.875E-01  (P 2.329E-02 1.23E-02 G
                          510.72 2.872E-01 + P 1.220E-01 5.09E-02 G

PB-212       5.2428E-01
                          238.63 5.243E-01  (P 4.229E-02 2.00E-02 G K
                                                          Energy duplication
                           77.11 4.129E-01 }   1.691E-01 4.84E-02 G
                           74.81 7.018E-01 + P 3.115E-01 1.01E-01 G

PB-214       4.5559E-01
                          351.99 4.402E-01  (P 5.833E-02 2.83E-02 G K
                          295.22 4.709E-01  (P 1.194E-01 5.17E-02 G
                                                          Energy duplication
                           77.11 3.938E-01 } P 3.696E-01 1.02E-01 G
                          241.92 4.926E-01  (P 2.939E-01 9.44E-02 G

BI-212       4.3779E-01
                          727.17 4.378E-01  (P 1.830E-01 7.55E-02 G K
                         1620.56 8.034E-02 % P 5.625E-01 1.52E-01 G
                          785.42 6.242E-01 % P 1.079E+00 3.30E-01 G

BI-214       4.4095E-01
                          609.32 4.211E-01 @(P 4.574E-02 2.53E-02 G K
                         1764.51 4.984E-01 @(P 7.338E-02 5.92E-02 G
                         1120.28 6.015E-01 + P 2.560E-01 1.20E-01 G

RA-224       6.1381E-01
                          241.00 6.138E-01 ?(P 7.838E-01 2.40E-01 G

RA-226       1.6852E+00
                          185.99 1.685E+00 *(  7.496E-01 2.94E-01 G

AC-228       5.8998E-01
                          911.07 6.095E-01 @(P 7.912E-02 4.43E-02 G K
                          968.90 5.576E-01  (P 1.229E-01 5.53E-02 G
                          338.40 7.376E-01 + P 2.130E-01 9.53E-02 G
```

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments

TH-227      -1.6456E-01
                          236.00-1.646E-01 %(P 2.564E-01 7.82E-02 G K
                          256.25 7.743E-02 % P 3.191E-01 9.54E-02 G

PA-234      -4.7973E-02
                           98.44-4.797E-02 %(  1.023E-01 3.10E-02 G K
                          946.00-2.606E-02 %   1.457E-01 4.27E-02 G
                          131.28 1.161E-03 &   1.206E-01 3.59E-02 G
                           94.67-1.213E-03 %   2.012E-01 6.01E-02 G
                          883.24 0.000E+00 %   2.310E-01 6.63E-02 G
                          926.70 0.000E+00 %   2.338E-01 6.67E-02 G
                          569.26 6.676E-02 %   2.081E-01 6.21E-02 G

TH-234       7.7203E-01
                           63.29 2.050E-01 %(P 1.335E+00 3.99E-01 G K
                           92.80 1.054E+00  (P 1.116E+00 3.42E-01 G
                           92.38 1.303E+00  (P 1.328E+00 4.08E-01 G

AM-241      -6.6708E-02
                           59.54-6.671E-02 %(P 1.897E-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	5.8158E-03	6.1447E-03	1.8653E-01	1.8653E-01	2.024E-01
K-40		1.2772E+01	1.2772E+01	9.5145E-01	1.2142E+00	
MN-54	#A	-8.6061E-03	-8.6875E-03	2.5608E-02	2.5613E-02	2.699E-02
CO-57	#B	-8.8759E-03	-8.9730E-03	2.6837E-02	2.6842E-02	2.901E-02
CO-60	#B	1.0006E-02	1.0021E-02	2.0325E-02	2.0334E-02	2.297E-02
Sr-85	#A	-1.2373E-02	-1.2946E-02	2.8840E-02	2.8850E-02	3.044E-02
Kr-85	#A	-3.0261E+02	-3.0261E+02	7.5034E+02	7.5055E+02	7.043E+02
Y-88	#B	-3.2567E-03	-3.3477E-03	2.8965E-02	2.8966E-02	2.130E-02
NB-94	#B	-7.4493E-05	-7.4493E-05	6.6876E-03	6.6876E-03	2.850E-02
Ag-108M	#B	-6.1057E-04	-6.1061E-04	4.3216E-02	4.3216E-02	4.885E-02
CD-109	#	9.7046E-01	9.7677E-01	8.5534E-01	8.5705E-01	9.177E-01
SN-113	#B	1.6438E-03	1.6863E-03	2.7694E-02	2.7694E-02	3.083E-02
SB-125	#B	1.8549E-02	1.8603E-02	5.9842E-02	5.9852E-02	6.691E-02
I-131	#B	-3.7743E-03	-5.4389E-03	3.2930E-02	3.2932E-02	2.575E-02
CS-134	#B	1.4644E-02	1.4701E-02	1.2100E-02	1.2131E-02	2.505E-02
CS-137	#A	3.7501E-03	3.7511E-03	2.2242E-02	2.2243E-02	2.563E-02
CE-139	#A	-9.0695E-03	-9.2653E-03	2.9507E-02	2.9512E-02	3.146E-02
EU-152	#B	-1.5696E-02	-1.5706E-02	8.4358E-02	8.4362E-02	9.270E-02
EU-154	#B	1.8519E-02	1.8536E-02	5.9860E-02	5.9868E-02	6.620E-02
EU-155	#	1.1937E-01	1.1956E-01	1.0370E-01	1.0392E-01	1.118E-01
HG-203	#B	-4.6445E-04	-4.9468E-04	1.9401E-01	1.9401E-01	2.540E-02
TL-208		1.8746E-01	1.8746E-01	3.6841E-02	3.8468E-02	
PB-212		5.2428E-01	5.2428E-01	6.0138E-02	6.7641E-02	
PB-214		4.5559E-01	4.5559E-01	8.7696E-02	9.1731E-02	
BI-212		4.3779E-01	4.3779E-01	2.2625E-01	2.2772E-01	
BI-214	#	4.4095E-01	4.4095E-01	7.9560E-02	8.3714E-02	
RA-224	#A	6.1381E-01	6.1381E-01	7.2079E-01	7.2170E-01	7.838E-01
RA-226	#	1.6852E+00	1.6852E+00	8.8168E-01	8.8728E-01	
AC-228		5.8998E-01	5.8998E-01	1.0877E-01	1.1421E-01	
TH-227	#B	-1.6456E-01	-1.6456E-01	2.3615E-01	2.3635E-01	2.564E-01
PA-234	#B	-4.7973E-02	-4.7973E-02	9.3048E-02	9.3086E-02	1.023E-01
TH-234	#B	7.7203E-01	7.7203E-01	7.2589E-01	7.2715E-01	1.335E+00
AM-241	#A	-6.6707E-02	-6.6708E-02	1.7560E-01	1.7564E-01	1.897E-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 (1120.2 to 2000.1 keV) 1.7093235E+01 pCi/gm
Total Decayed Activity (1120.2 to 2000.1 keV) 1.7093243E+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_1AUG2006_1610.An1

Sample description
FSS-OOL-10-01-025-F

Spectrum Filename: C:\GammaVision\Spectra\107F_1AUG2006_1610.An1

Acquisition information

Start time:	01-Aug-2006 16:10:54
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:	1.9220E+03
Activity scaling factor:	1.0000E+06/(1.0000E+00* 1.9220E+03) = 5.2029E+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	28-Jul-2006 09:50:00
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. 20 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.2872

***** 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	435.	10.73	1.18	2.849E-02	74.81	9.600	1.117E+00	PB212
77.15	470.	8.81	1.18	2.957E-02	77.11	17.500	8.971E-01	PB212
					77.11	10.700	1.457E+00	PB214
77.26	180.	30.85	1.50	2.957E-02	77.11	17.500	PBC<MDA	PB212
					77.11	10.700	PBC<MDA	PB214
86.92	205.	20.38	1.19	3.306E-02	86.45	32.740	1.342E-01	EU155
					88.04	3.790	1.148E+00	CD109
89.84	166.	24.50	1.19	3.379E-02				
93.26	214.	18.94	1.19	3.455E-02	92.38	2.570	1.646E+00	TH234
					92.80	3.000	PBC<MDA	TH234
186.07	210.	21.63	1.33	3.610E-02	185.99	3.280	1.247E+00	RA226
209.69	171.	21.07	1.47	3.425E-02				
238.83	1692.	3.05	1.30	3.189E-02	238.63	43.100	8.575E-01	PB212
241.53	236.	21.26	1.30	3.167E-02	241.00	3.900	1.328E+00	RA224
					241.92	7.470	6.974E-01	PB214
270.25	149.	27.97	1.33	2.944E-02				
277.47	80.	40.93	1.61	2.892E-02				
295.34	284.	9.35	1.34	2.767E-02	295.22	19.200	3.694E-01	PB214
300.77	105.	22.32	1.34	2.730E-02				
328.13	131.	19.33	1.54	2.560E-02				
338.64	406.	12.15	1.52	2.499E-02	338.40	12.010	9.428E-01	AC228
352.07	610.	5.93	1.34	2.425E-02	351.99	37.100	4.722E-01	PB214
463.38	146.	16.77	1.23	1.953E-02				
463.38	146.	16.77	1.23	1.953E-02	463.51	10.000	5.171E-01	SB125
511.23	288.	12.40	2.00	1.807E-02	510.72	22.500	4.391E-01	TL208
583.51	658.	5.79	1.58	1.628E-02	583.14	86.000	3.280E-01	TL208
609.50	389.	9.40	1.56	1.574E-02	609.32	46.090	3.732E-01	BI214

727.67	187.	16.98	1.88	1.374E-02	727.17	11.800	8.043E-01	BI212
784.81	39.	40.92	0.87	1.297E-02	785.42	2.000	PBC<MDA	BI212
795.98	126.	20.30	1.56	1.284E-02	795.76	85.400	8.077E-02	CS134
911.50	365.	7.23	1.79	1.160E-02	911.07	29.000	7.533E-01	AC228
969.04	308.	9.89	1.40	1.109E-02	968.90	17.460	1.112E+00	AC228
1120.51	187.	13.83	1.82	9.968E-03	1120.28	15.040	8.736E-01	BI214

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
1461.40	2067.	2.29	2.02	8.188E-03	1460.75	10.700	1.655E+01	K40
1589.06	59.	18.10	1.63	7.684E-03				
1621.95	31.	24.61	0.85	7.569E-03	1620.56	2.750	1.064E+00	BI212
1765.81	96.	10.98	1.93	7.079E-03	1764.51	15.920	5.961E-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	
173.51	87.26	769.	205.	0.102	61.14	1.187	PB-214	D
179.34	90.17	742.	166.	0.083	73.50	1.189	PB-214	D
186.19	93.59	717.	214.	0.107	56.83	1.191	U-235	D
419.03	209.69	511.	171.	0.085	63.22	1.469	NP-239	s
540.12	270.25	545.	149.	0.074	83.92	1.335	AC-228	
601.19	300.78	315.	165.	0.082	57.11	1.589	PB-212	s
655.88	328.13	233.	131.	0.066	58.00	1.535	AC-228	
1591.53	795.98	183.	75.	0.037	84.02	1.557	PA-234	s
3177.74	1589.06	16.	59.	0.030	54.29	1.634	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	74.81	892.	435.	0.217	32.19	1.178D
PB-212	153.89	77.11	976.	470.	0.235	26.43	1.179A
PB-214	153.89	77.11	1719.	180.	0.090	92.55	1.500A
TH-234	185.71	93.02	1760.	186.	0.093	93.98	1.500s
TH-234	185.71	93.02	1728.	173.	0.086	93.74	1.500s
RA-226	371.78	186.07	741.	210.	0.105	64.88	1.325s
TH-227	472.19	236.28	1703.	-180.	-0.090	100.21	1.500s
PB-212	476.89	238.63	417.	1677.	0.839	8.85	1.297D
RA-224	482.79	241.58	1192.	139.	0.069	106.95	1.500s
PB-214	483.47	241.92	654.	199.	0.100	57.96	1.299D
PB-214	590.33	295.35	256.	270.	0.135	31.02	1.360
AC-228	676.89	338.64	522.	403.	0.201	36.44	1.517s
PB-214	703.75	352.07	264.	604.	0.302	17.79	1.342s
SB-125	925.79	463.09	153.	110.	0.055	53.93	1.500s
TL-208	1022.06	511.23	286.	254.	0.127	37.19	2.004s
TL-208	1166.61	583.51	208.	653.	0.327	17.36	1.579s
BI-214	1218.59	609.50	248.	385.	0.193	28.20	1.560s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
BI-212	1454.91	727.67	196.	186.	0.093	50.95	1.875s
CS-134	1590.50	795.47	126.	64.	0.032	82.54	1.684s
AC-228	1822.55	911.50	111.	361.	0.180	21.70	1.788
AC-228	1937.65	969.04	162.	306.	0.153	29.66	1.396
BI-214	2240.59	1120.51	119.	186.	0.093	41.49	1.822s
K-40	2922.41	1461.40	46.	2062.	1.031	6.88	2.023
BI-212	3243.51	1621.95	11.	31.	0.016	73.82	0.845s
BI-214	3531.27	1765.81	4.	96.	0.048	32.94	1.933s

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		-3.6731E-02					
			477.56	-3.673E-02	&(	2.433E-01 7.17E-02	G
K-40		1.6546E+01					
			1460.75	1.655E+01	(P	2.740E-01 3.80E-01	G
MN-54		-6.4046E-03					
			834.81	-6.405E-03	&(P	3.372E-02 9.93E-03	G
CO-57		-8.2961E-03					
			122.07	-8.296E-03	%(P	3.537E-02 1.06E-02	G K
			136.43	7.204E-02	& P	2.826E-01 8.51E-02	G
CO-60		-3.3471E-03					
			1332.51	-3.347E-03	%(P	2.926E-02 7.94E-03	G K
			1173.23	1.155E-02	& P	3.757E-02 1.11E-02	G K
Sr-85		-1.9213E-02					
			514.00	-1.921E-02	&(	3.697E-02 1.12E-02	G
Kr-85		-4.5100E+02					
			513.99	-4.510E+02	&(P	8.189E+02 2.48E+02	G
Y-88		1.9119E-03					
			1836.01	1.912E-03	&(P	2.359E-02 6.37E-03	G K
			898.02	-6.324E-03	% P	3.449E-02 1.00E-02	G
NB-94		4.5966E-03					
			871.10	4.597E-03	&(P	2.822E-02 8.25E-03	G K
			702.50	5.827E-03	& P	2.972E-02 8.77E-03	G K

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
Ag-108M	-2.6127E-03						
		722.95	-2.613E-03	%(	5.984E-02	1.77E-02	G K
		614.37	-1.246E-02	%	3.534E-02	1.06E-02	G
		433.93	-7.655E-04	% P	2.676E-02	7.78E-03	G
CD-109	6.1061E-01						
		88.04	6.106E-01	%(P	1.037E+00	3.15E-01	G
SN-113	6.1869E-03						
		391.71	6.187E-03	&(P	3.994E-02	1.18E-02	G K
		255.04	2.425E-02	&	1.237E+00	3.67E-01	G
SB-125	1.1009E-01						
		427.95	1.255E-02	&(P	8.452E-02	2.50E-02	G K
		600.77	-3.295E-03	& P	1.592E-01	4.62E-02	G
		636.15	-6.994E-02	& P	2.541E-01	7.54E-02	G
		463.51	3.988E-01	*(P	2.182E-01	7.35E-02	G
		176.29	6.317E-02	% P	4.604E-01	1.38E-01	G
I-131	7.3258E-03						
		364.48	7.326E-03	%(	4.146E-02	1.23E-02	G K
		636.97	1.111E-01	&	4.846E-01	1.43E-01	G
		284.29	-2.679E-01	%	6.378E-01	1.93E-01	G
CS-134	-1.6337E-02						
		604.66	-1.634E-02	&(P	3.572E-02	1.08E-02	G K
		795.76	4.117E-02	+ P	3.537E-02	1.14E-02	G
		569.29	2.993E-03	&	1.952E-01	5.70E-02	G
		801.84	-9.864E-02	% P	3.533E-01	1.05E-01	G
CS-137	-2.6861E-03						
		661.62	-2.686E-03	&(P	3.463E-02	9.96E-03	G
CE-139	-6.2930E-03						
		165.85	-6.293E-03	%(P	3.515E-02	1.05E-02	G
EU-152	-2.3421E-02						
		121.78	-2.342E-02	%(P	1.054E-01	3.17E-02	G K
		344.30	-1.317E-03	% P	9.276E-02	2.73E-02	G
		1408.08	1.520E-02	% P	1.197E-01	3.38E-02	G
		964.00	3.894E-03	& P	2.196E-01	6.32E-02	G
		1112.07	-9.587E-03	% P	3.183E-01	9.24E-02	G
		778.90	8.825E-03	% P	2.335E-01	6.77E-02	G
EU-154	-1.0255E-02						
		123.10	-1.025E-02	%(P	6.852E-02	2.05E-02	G K
		1274.80	2.614E-02	% P	9.964E-02	2.94E-02	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          723.30 4.444E-03 % P 1.758E-01 5.13E-02 G
                         1004.80 7.576E-02 % P 1.745E-01 5.26E-02 G

EU-155       8.5034E-02
                           86.45 8.503E-02 %(  1.346E-01 4.10E-02 G K
                          105.31 9.908E-02 % P 1.524E-01 4.65E-02 G

HG-203      -7.3603E-05
                          279.17-7.360E-05 &(P 3.272E-02 9.66E-03 G K
                           72.87-2.683E-01 % P 8.804E-01 2.66E-01 G
                           70.83-6.846E-01 %   1.791E+00 5.42E-01 G
                           82.50-7.775E-01 &   2.191E+00 6.62E-01 G

TL-208       3.2796E-01
                          583.14 3.280E-01 @(P 3.505E-02 1.91E-02 G
                          510.72 4.391E-01 + P 1.409E-01 6.17E-02 G

PB-212       8.6911E-01
                          238.63 8.577E-01  (P 5.006E-02 2.55E-02 G K
                                                          Energy duplication
                           77.11 6.389E-01 }   2.014E-01 5.63E-02 G
                           74.81 1.117E+00 + P 3.647E-01 1.21E-01 G

PB-214       4.7225E-01
                          351.99 4.722E-01 @(P 6.121E-02 2.83E-02 G K
                          295.22 3.567E-01 - P 1.023E-01 3.75E-02 G
                                                          Energy duplication
                           77.11 4.005E-01 } P 4.353E-01 1.24E-01 G
                          241.92 5.933E-01 + P 3.626E-01 1.15E-01 G

BI-212       8.5340E-01
                          727.17 8.043E-01  (P 2.950E-01 1.38E-01 G K
                         1620.56 1.064E+00  (P 6.017E-01 2.66E-01 G
                          785.42 1.061E+00 % P 1.278E+00 4.48E-01 G

BI-214       3.7316E-01
                          609.32 3.732E-01 @(P 7.373E-02 3.55E-02 G K
                         1764.51 5.961E-01 + P 7.781E-02 6.61E-02 G
                         1120.28 8.736E-01 + P 2.508E-01 1.21E-01 G

RA-224       7.8822E-01
                          241.00 7.882E-01 ?(P 9.305E-01 2.86E-01 G

RA-226       1.2469E+00
                          185.99 1.247E+00 *(  7.693E-01 2.70E-01 G

AC-228       7.5330E-01
                          911.07 7.533E-01  (P 1.084E-01 5.52E-02 G K
                          968.90 1.112E+00 + P 2.250E-01 1.11E-01 G
                          338.40 9.428E-01 + P 2.557E-01 1.15E-01 G
```

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TH-227	-3.5099E-01						
		236.00	-3.510E-01	?(P	3.813E-01	1.17E-01	G K
		256.25	9.513E-02	% P	3.742E-01	1.12E-01	G
PA-234	0.0000E+00						
		98.44	0.000E+00	%(	1.407E-01	4.20E-02	G K
		946.00	3.772E-03	&	1.560E-01	4.49E-02	G
		131.28	-2.126E-02	%	1.564E-01	4.69E-02	G
		94.67	-1.167E-01	%	2.640E-01	8.00E-02	G
		883.24	4.261E-02	%	1.954E-01	5.71E-02	G
		926.70	-5.642E-02	%	2.530E-01	7.43E-02	G
		569.26	4.422E-03	&	2.885E-01	8.43E-02	G
TH-234	9.2651E-01						
		63.29	3.665E-01	%(P	1.642E+00	4.93E-01	G K
		92.80	1.176E+00	(P	1.339E+00	4.10E-01	G
		92.38	1.485E+00	&(P	1.581E+00	4.85E-01	G
AM-241	3.9091E-03						
		59.54	3.909E-03	%(P	2.146E-01	6.42E-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	-3.4753E-02	-3.6731E-02	2.1508E-01	2.1509E-01	2.302E-01
K-40		1.6546E+01	1.6546E+01	1.1408E+00	1.5021E+00	
MN-54	#A	-6.3443E-03	-6.4046E-03	3.2158E-02	3.2160E-02	3.340E-02
CO-57	#B	-8.2058E-03	-8.2961E-03	3.2377E-02	3.2380E-02	3.498E-02
CO-60	#B	-3.3419E-03	-3.3471E-03	4.6407E-01	4.6407E-01	2.922E-02
Sr-85	#A	-1.8357E-02	-1.9213E-02	3.3718E-02	3.3738E-02	3.533E-02
Kr-85	#A	-4.5099E+02	-4.5100E+02	8.3919E+02	8.3961E+02	8.189E+02
Y-88	#B	1.8596E-03	1.9119E-03	1.9124E-02	1.9125E-02	2.294E-02
NB-94	#B	4.5966E-03	4.5966E-03	2.4737E-02	2.4739E-02	2.822E-02
Ag-108M	#B	-2.6125E-03	-2.6127E-03	5.3220E-02	5.3221E-02	5.984E-02
CD-109	#A	6.0664E-01	6.1061E-01	9.4643E-01	9.4704E-01	1.030E+00
SN-113	#B	6.0300E-03	6.1869E-03	3.5458E-02	3.5460E-02	3.893E-02
SB-125	#F	1.0976E-01	1.1009E-01	6.0884E-02	6.1230E-02	8.427E-02
I-131	#B	5.0721E-03	7.3258E-03	3.6916E-02	3.6918E-02	2.870E-02
CS-134	#B	-1.6273E-02	-1.6337E-02	3.3364E-02	3.3378E-02	3.558E-02
CS-137	#A	-2.6853E-03	-2.6861E-03	1.9986E-01	1.9986E-01	3.462E-02
CE-139	#A	-6.1592E-03	-6.2930E-03	3.2450E-02	3.2453E-02	3.440E-02
EU-152	#B	-2.3406E-02	-2.3421E-02	9.5785E-02	9.5793E-02	1.053E-01
EU-154	#B	-1.0245E-02	-1.0255E-02	6.4619E-02	6.4621E-02	6.845E-02
EU-155	#B	8.4895E-02	8.5034E-02	1.2297E-01	1.2306E-01	1.344E-01
HG-203	#B	-6.9078E-05	-7.3603E-05	4.1532E-02	4.1532E-02	3.071E-02
TL-208	#	3.2796E-01	3.2796E-01	5.7327E-02	6.0511E-02	
PB-212		8.6911E-01	8.6911E-01	7.7664E-02	9.3094E-02	
PB-214		4.7225E-01	4.7225E-01	8.4739E-02	8.9211E-02	
BI-212		8.5340E-01	8.5340E-01	3.8773E-01	3.9099E-01	
BI-214	#	3.7316E-01	3.7316E-01	1.0640E-01	1.0866E-01	
RA-224	#A	7.8822E-01	7.8822E-01	8.5658E-01	8.5784E-01	9.305E-01
RA-226	#	1.2469E+00	1.2469E+00	8.0897E-01	8.1232E-01	
AC-228		7.5330E-01	7.5330E-01	1.6541E-01	1.7129E-01	
TH-227	#A	-3.5099E-01	-3.5099E-01	3.5226E-01	3.5287E-01	3.813E-01
PA-234	#B	0.0000E+00	0.0000E+00	1.2614E-01	1.2614E-01	1.407E-01
TH-234	#B	9.2651E-01	9.2651E-01	9.0801E-01	9.0946E-01	1.642E+00
AM-241	#A	3.9091E-03	3.9091E-03	1.9248E-01	1.9248E-01	2.146E-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) 2.1441730E+01 pCi/gm
Total Decayed Activity (270.2 to 2000.1 keV) 2.1441736E+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_1AUG2006_1650.An1

Sample description
FSS-OOL-10-01-017-F

Spectrum Filename: C:\GammaVision\Spectra\107F_1AUG2006_1650.An1

Acquisition information

Start time:	01-Aug-2006 16:50:27
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:	1.9860E+03
Activity scaling factor:	1.0000E+06/(1.0000E+00* 1.9860E+03) = 5.0352E+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	28-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. 21 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.2225

***** 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	298.	20.58	1.50	2.849E-02				
74.80	298.	20.58	1.50	2.849E-02	74.81	9.600	7.418E-01	PB212
77.03	452.	13.17	1.50	2.957E-02	77.11	10.700	9.725E-01	PB214
					77.11	17.500	5.946E-01	PB212
77.03	457.	13.17	1.50	2.957E-02	77.11	10.700	9.725E-01	PB214
					77.11	17.500	6.009E-01	PB212
86.90	188.	20.55	1.19	3.293E-02	86.45	32.740	1.191E-01	EU155
					88.04	3.790	1.019E+00	CD109
90.35	97.	36.57	1.19	3.381E-02				
93.28	202.	18.13	1.19	3.446E-02	92.38	2.570	1.497E+00	TH234
					92.80	3.000	1.201E+00	TH234
128.96	119.	40.44	1.30	3.818E-02				
128.96	119.	40.44	1.30	3.818E-02	131.28	20.000	1.057E-01	PA234
153.86	184.	26.50	1.35	3.797E-02				
186.37	245.	21.72	1.47	3.607E-02	185.99	3.280	1.408E+00	RA226
208.93	177.	23.06	1.60	3.431E-02				
238.82	1204.	3.75	1.30	3.188E-02	238.63	43.100	5.882E-01	PB212
242.19	219.	13.77	1.30	3.161E-02	241.00	3.900	1.191E+00	RA224
					241.92	7.470	6.257E-01	PB214
269.93	97.	26.53	1.56	2.947E-02				
295.29	297.	8.85	1.34	2.767E-02	295.22	19.200	3.740E-01	PB214
300.85	91.	23.39	1.34	2.730E-02				
338.43	271.	13.53	1.56	2.500E-02	338.40	12.010	6.059E-01	AC228
352.06	546.	7.48	1.39	2.425E-02	351.99	37.100	4.089E-01	PB214
463.42	101.	18.61	2.28	1.953E-02				
463.42	101.	18.61	2.28	1.953E-02	463.51	10.000	3.424E-01	SB125
510.80	213.	17.51	1.83	1.808E-02	510.72	22.500	3.006E-01	TL208

583.54	480.	6.52	1.77	1.628E-02	583.14	86.000	2.307E-01	TL208
609.58	445.	6.55	1.97	1.574E-02	609.32	46.090	4.131E-01	BI214
662.05	66.	33.94	0.74	1.476E-02	661.62	84.620	3.374E-02	CS137
727.70	142.	16.26	2.24	1.374E-02	727.17	11.800	5.921E-01	BI212
860.64	64.	26.65	1.12	1.211E-02				
911.62	316.	8.23	1.61	1.160E-02	911.07	29.000	6.298E-01	AC228
964.80	62.	21.72	1.80	1.113E-02				
969.58	162.	10.02	1.80	1.109E-02	968.90	17.460	5.600E-01	AC228
1120.94	132.	17.59	1.98	9.966E-03	1120.28	15.040	5.932E-01	BI214

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
1461.38	1622.	2.54	2.06	8.188E-03	1460.75	10.700	1.255E+01	K40
1620.47	14.	34.36	1.27	7.569E-03	1620.56	2.750	4.543E-01	BI212
1765.39	73.	12.57	1.59	7.081E-03	1764.51	15.920	4.357E-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	
179.35	90.24	590.	92.	0.046	116.46	1.189	PB-214	D
185.21	93.17	561.	209.	0.105	52.30	1.191	U-235	D
307.37	153.86	808.	184.	0.092	79.49	1.354	XE-138	s
417.49	208.93	571.	177.	0.088	69.17	1.596	AC-228	s
477.27	238.81	418.	1204.	0.602	11.25	1.297	PB-212	D
484.02	242.18	344.	219.	0.109	41.31	1.300	PB-214	D
539.48	269.93	267.	97.	0.048	79.58	1.564	AC-228	s
601.38	300.88	238.	110.	0.055	71.18	1.347	PB-212	s
1323.68	662.05	142.	46.	0.023	118.90	0.742	CS-137	s
1720.85	860.64	81.	64.	0.032	79.94	1.119	TL-208	s
1930.24	964.73	59.	64.	0.032	62.76	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	149.26	74.80	1785.	298.	0.149	61.74	1.500s
PB-214	153.89	77.11	1586.	452.	0.226	39.50	1.500D
PB-212	153.89	77.11	1582.	457.	0.229	39.50	1.500D
EU-155	174.05	87.19	1432.	197.	0.098	84.32	1.500
CD-109	175.74	88.04	660.	174.	0.087	66.42	1.187D
TH-234	185.74	93.04	1339.	205.	0.103	75.42	1.500s
TH-234	185.69	93.01	1314.	193.	0.096	74.65	1.500s
RA-226	372.38	186.37	862.	245.	0.123	65.15	1.465s
TH-227	480.23	240.30	950.	-113.	-0.056	119.52	1.500s
PB-212	477.27	238.82	919.	1175.	0.588	13.79	1.500s
RA-224	483.54	241.95	991.	143.	0.071	95.19	1.500
PB-214	590.39	295.38	344.	301.	0.151	30.80	1.500s
AC-228	676.48	338.43	338.	267.	0.134	40.59	1.557
PB-214	703.87	352.13	243.	481.	0.241	19.14	1.500
SB-125	926.66	463.53	142.	79.	0.040	69.55	1.500s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
TL-208	1021.20	510.80	315.	180.	0.090	52.53	1.828s
TL-208	1166.67	583.54	147.	475.	0.237	19.57	1.766s
BI-214	1218.74	609.58	135.	440.	0.220	19.65	1.971s
BI-212	1454.97	727.70	105.	141.	0.071	48.78	2.239s
AC-228	1822.80	911.62	101.	312.	0.156	24.69	1.610
AC-228	1937.36	968.90	79.	159.	0.080	32.89	1.799D
BI-214	2241.44	1120.94	107.	131.	0.065	52.77	1.979
K-40	2922.37	1461.38	21.	1617.	0.808	7.61	2.060
BI-212	3240.57	1620.47	4.	14.	0.007	103.08	1.266s
BI-214	3530.43	1765.39	4.	72.	0.036	37.71	1.594s

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		6.1734E-02					
			477.56	6.173E-02	&(	2.208E-01 6.57E-02	G
K-40		1.2552E+01					
			1460.75	1.255E+01	(P	1.877E-01 3.20E-01	G
MN-54		-9.1120E-04					
			834.81	-9.112E-04	&(P	2.937E-02 8.46E-03	G
CO-57		-5.5811E-03					
			122.07	-5.581E-03	&(P	3.305E-02 9.91E-03	G K
			136.43	-2.109E-02	& P	2.499E-01 7.47E-02	G
CO-60		-1.2913E-03					
			1332.51	-1.291E-03	&(P	2.795E-02 7.63E-03	G K
			1173.23	-3.640E-04	& P	3.588E-02 1.02E-02	G K
Sr-85		-1.5273E-02					
			514.00	-1.527E-02	%(	3.268E-02 9.90E-03	G
Kr-85		-3.6310E+02					
			513.99	-3.631E+02	%(P	7.242E+02 2.18E+02	G
Y-88		-8.3448E-04					
			1836.01	-8.345E-04	%(P	2.370E-02 6.21E-03	G K
			898.02	-6.881E-03	& P	3.261E-02 9.51E-03	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
NB-94	-5.4022E-04						
		871.10	-5.402E-04	&(P	2.320E-02	6.59E-03	G K
		702.50	4.101E-03	% P	1.902E-02	5.54E-03	G K
Ag-108M	2.0591E-04						
		722.95	2.059E-04	%(	2.225E-02	6.31E-03	G K
		614.37	-1.699E-02	%	3.477E-02	1.06E-02	G
		433.93	-7.253E-03	% P	2.291E-02	6.80E-03	G
CD-109	9.4650E-01						
		88.04	9.465E-01	(P	6.650E-01	2.10E-01	G
SN-113	2.0140E-03						
		391.71	2.014E-03	&(P	3.567E-02	1.04E-02	G K
		255.04	-3.320E-01	&	1.096E+00	3.29E-01	G
SB-125	8.6960E-02						
		427.95	2.294E-02	&(P	7.023E-02	2.10E-02	G K
		600.77	3.079E-02	% P	1.124E-01	3.32E-02	G
		636.15	-4.532E-02	& P	2.149E-01	6.32E-02	G
		463.51	2.765E-01	*(P	2.037E-01	6.64E-02	G
		176.29	-1.061E-01	% P	4.005E-01	1.20E-01	G
I-131	1.7483E-03						
		364.48	1.748E-03	%(	3.269E-02	9.54E-03	G K
		636.97	0.000E+00	&	4.505E-01	1.29E-01	G
		284.29	-3.339E-02	%	4.783E-01	1.41E-01	G
CS-134	-1.4025E-02						
		604.66	-1.402E-02	%(P	2.859E-02	8.66E-03	G K
		795.76	1.454E-02	% P	2.910E-02	8.84E-03	G
		569.29	4.940E-03	%	1.422E-01	4.11E-02	G
		801.84	1.689E-02	& P	2.925E-01	8.43E-02	G
CS-137	8.7784E-03						
		661.62	8.778E-03	%(P	2.934E-02	8.67E-03	G
CE-139	1.3973E-03						
		165.85	1.397E-03	&(P	2.996E-02	8.92E-03	G
EU-152	-1.0588E-02						
		121.78	-1.059E-02	&(P	9.282E-02	2.78E-02	G K
		344.30	-3.053E-04	% P	7.629E-02	2.23E-02	G
		1408.08	1.919E-02	% P	1.032E-01	2.93E-02	G
		964.00	3.435E-02	& P	1.659E-01	4.84E-02	G
		1112.07	-4.117E-02	& P	2.218E-01	6.45E-02	G
		778.90	-3.112E-02	% P	1.887E-01	5.49E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
EU-154	-9.7648E-03						
		123.10	-9.765E-03	&(P	6.516E-02	1.95E-02	G K
		1274.80	3.838E-02	& P	7.117E-02	2.18E-02	G
		723.30	-7.561E-02	% P	1.533E-01	4.65E-02	G
		1004.80	-3.968E-03	% P	1.587E-01	4.53E-02	G
EU-155	1.2477E-01						
		86.45	1.248E-01	(	1.135E-01	3.51E-02	G K
		105.31	3.287E-02	% P	1.340E-01	4.03E-02	G
HG-203	-7.2931E-04						
		279.17	-7.293E-04	%(P	2.862E-02	8.42E-03	G K
		72.87	-3.847E-01	& P	9.131E-01	2.76E-01	G
		70.83	-7.603E-03	%	1.223E+00	3.65E-01	G
		82.50	-5.037E-01	%	1.926E+00	5.80E-01	G
TL-208	2.3069E-01						
		583.14	2.307E-01	@(P	2.876E-02	1.52E-02	G
		510.72	3.006E-01	+ P	1.429E-01	6.25E-02	G
PB-212	5.8733E-01						
		238.63	5.818E-01	*(P	7.125E-02	2.71E-02	G K
							Energy duplication
		77.11	6.009E-01	*(	2.472E-01	7.91E-02	G
		74.81	7.418E-01	+ P	4.965E-01	1.55E-01	G
PB-214	3.7117E-01						
		351.99	3.637E-01	(P	5.697E-02	2.35E-02	G K
		295.22	3.855E-01	@(P	1.141E-01	4.02E-02	G
							Energy duplication
		77.11	9.725E-01	+ P	4.049E-01	1.29E-01	G
		241.92	2.893E-01	% P	4.465E-01	1.36E-01	G
BI-212	5.6606E-01						
		727.17	5.921E-01	(P	2.116E-01	9.72E-02	G K
		1620.56	4.543E-01	(P	3.971E-01	1.62E-01	G
		785.42	1.876E-01	% P	1.345E+00	3.92E-01	G
BI-214	4.1888E-01						
		609.32	4.131E-01	@(P	5.323E-02	2.73E-02	G K
		1764.51	4.357E-01	(P	7.113E-02	5.55E-02	G
		1120.28	5.932E-01	+ P	2.313E-01	1.05E-01	G
RA-224	7.8662E-01						
		241.00	7.866E-01	?(P	8.221E-01	2.54E-01	G
RA-226	1.4078E+00						
		185.99	1.408E+00	*(	8.018E-01	3.06E-01	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments

AC-228       6.0408E-01
                          911.07 6.298E-01  (P 1.003E-01 5.26E-02 G K
                          968.90 5.602E-01  (P 1.546E-01 6.23E-02 G
                          338.40 6.059E-01  (P 2.002E-01 8.30E-02 G

TH-227      -2.1356E-01
                          236.00-2.136E-01 ?(P 2.769E-01 8.49E-02 G K
                          256.25 4.810E-02 & P 3.261E-01 9.70E-02 G

PA-234       2.0667E-02
                           98.44 2.067E-02 %(  1.231E-01 3.69E-02 G K
                          946.00 1.236E-04 %   1.301E-01 3.70E-02 G
                          131.28-9.211E-04 &   1.194E-01 3.55E-02 G
                           94.67-9.972E-02 %   2.221E-01 6.73E-02 G
                          883.24-1.634E-02 %   1.936E-01 5.55E-02 G
                          926.70 5.439E-02 &   1.735E-01 5.12E-02 G
                          569.26-1.568E-02 %   1.841E-01 5.32E-02 G

TH-234       1.0694E+00
                           63.29 5.731E-01 %(P 1.430E+00 4.31E-01 G K
                           92.80 1.273E+00  (P 1.132E+00 3.49E-01 G
                           92.38 1.585E+00  (P 1.337E+00 4.14E-01 G

AM-241       5.8961E-03
                           59.54 5.896E-03 %(P 1.825E-01 5.45E-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	5.8386E-02	6.1734E-02	1.9724E-01	1.9727E-01	2.089E-01
K-40		1.2552E+01	1.2552E+01	9.5819E-01	1.2115E+00	
MN-54	#A	-9.0255E-04	-9.1120E-04	4.3330E-02	4.3330E-02	2.909E-02
CO-57	#B	-5.5199E-03	-5.5811E-03	3.0373E-02	3.0375E-02	3.269E-02
CO-60	#B	-1.2893E-03	-1.2913E-03	5.9131E-02	5.9131E-02	2.791E-02
Sr-85	#A	-1.4587E-02	-1.5273E-02	2.9708E-02	2.9722E-02	3.122E-02
Kr-85	#A	-3.6309E+02	-3.6310E+02	7.5745E+02	7.5776E+02	7.242E+02
Y-88	#B	-8.1149E-04	-8.3448E-04	3.0319E-02	3.0319E-02	2.305E-02
NB-94	#B	-5.4022E-04	-5.4022E-04	2.6342E-02	2.6342E-02	2.320E-02
Ag-108M	#B	2.0590E-04	2.0591E-04	1.8939E-02	1.8939E-02	2.225E-02
CD-109		9.4031E-01	9.4650E-01	6.2984E-01	6.3202E-01	
SN-113	#B	1.9625E-03	2.0140E-03	3.1347E-02	3.1347E-02	3.475E-02
SB-125	#F	8.6704E-02	8.6960E-02	6.2635E-02	6.2845E-02	7.003E-02
I-131	#B	1.2072E-03	1.7483E-03	2.8632E-02	2.8632E-02	2.257E-02
CS-134	#B	-1.3970E-02	-1.4025E-02	2.6852E-02	2.6865E-02	2.848E-02
CS-137	#A	8.7760E-03	8.7784E-03	2.6023E-02	2.6028E-02	2.933E-02
CE-139	#A	1.3674E-03	1.3973E-03	2.6754E-02	2.6754E-02	2.932E-02
EU-152	#B	-1.0581E-02	-1.0588E-02	8.4680E-02	8.4682E-02	9.276E-02
EU-154	#B	-9.7554E-03	-9.7648E-03	6.1486E-02	6.1488E-02	6.510E-02
EU-155	#	1.2456E-01	1.2477E-01	1.0520E-01	1.0543E-01	1.133E-01
HG-203	#B	-6.8416E-04	-7.2931E-04	8.6762E-02	8.6762E-02	2.685E-02
TL-208	#	2.3069E-01	2.3069E-01	4.5574E-02	4.7567E-02	
PB-212	#	5.8733E-01	5.8733E-01	8.2062E-02	8.9092E-02	7.125E-02
PB-214	#	3.7117E-01	3.7117E-01	6.8221E-02	7.1657E-02	5.697E-02
BI-212		5.6606E-01	5.6606E-01	2.7864E-01	2.8063E-01	
BI-214		4.1888E-01	4.1888E-01	8.3100E-02	8.6705E-02	
RA-224	#A	7.8662E-01	7.8662E-01	7.6051E-01	7.6193E-01	8.221E-01
RA-226	#	1.4078E+00	1.4078E+00	9.1724E-01	9.2100E-01	
AC-228		6.0408E-01	6.0408E-01	1.1787E-01	1.2315E-01	
TH-227	#A	-2.1356E-01	-2.1356E-01	2.5587E-01	2.5618E-01	2.769E-01
PA-234	#B	2.0667E-02	2.0667E-02	1.1079E-01	1.1080E-01	1.231E-01
TH-234	#B	1.0694E+00	1.0694E+00	8.3790E-01	8.3999E-01	1.430E+00
AM-241	#A	5.8960E-03	5.8961E-03	1.6340E-01	1.6340E-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 (1120.2 to 2000.1 keV) 1.6720041E+01 pCi/gm
Total Decayed Activity (1120.2 to 2000.1 keV) 1.6726246E+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_1AUG2006_1727.An1

Sample description
FSS-OOL-10-01-002-F

Spectrum Filename: C:\GammaVision\Spectra\107F_1AUG2006_1727.An1

Acquisition information

Start time:	01-Aug-2006 17:27:49
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:	2.0780E+03
Activity scaling factor:	1.0000E+06/(1.0000E+00* 2.0780E+03) = 4.8123E+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	28-Jul-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. 16 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.2779

***** 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
74.40	255.	15.05	1.18	2.842E-02				
74.40	255.	15.05	1.18	2.842E-02	74.81	9.600	5.961E-01	PB212
77.32	393.	9.80	1.18	2.978E-02	77.11	10.700	7.975E-01	PB214
					77.11	17.500	4.936E-01	PB212
106.53	144.	35.64	1.56	3.662E-02	105.31	21.800	PBC<MDA	EU155
186.03	207.	19.38	1.55	3.610E-02	185.99	3.280	1.138E+00	RA226
208.92	148.	23.53	1.62	3.432E-02				
238.82	923.	4.31	1.30	3.188E-02	238.63	43.100	4.291E-01	PB212
241.78	199.	16.05	1.30	3.164E-02	241.00	3.900	1.037E+00	RA224
					241.92	7.470	5.446E-01	PB214
258.57	83.	36.03	1.11	3.032E-02				
295.30	309.	10.52	1.35	2.767E-02	295.22	19.200	3.721E-01	PB214
328.68	66.	37.22	1.49	2.556E-02				
338.63	203.	13.08	1.51	2.499E-02	338.40	12.010	4.326E-01	AC228
352.12	522.	6.68	1.34	2.425E-02	351.99	37.100	3.737E-01	PB214
463.39	49.	32.98	1.50	1.953E-02	463.51	10.000	PBC<MDA	SB125
511.00	138.	12.10	2.78	1.808E-02	510.72	22.500	2.213E-01	TL208
583.51	337.	8.32	1.51	1.628E-02	583.14	86.000	1.543E-01	TL208
609.68	405.	5.84	1.72	1.573E-02	609.32	46.090	3.589E-01	BI214
727.46	80.	22.36	0.89	1.374E-02	727.17	11.800	3.157E-01	BI212
795.55	51.	22.41	1.68	1.284E-02	795.76	85.400	3.059E-02	CS134
861.26	59.	27.49	1.43	1.210E-02				
911.60	319.	7.99	1.67	1.160E-02	911.07	29.000	6.075E-01	AC228
968.90	218.	11.32	1.67	1.109E-02	968.90	17.460	7.261E-01	AC228
1121.12	100.	20.30	2.58	9.970E-03	1120.28	15.040	4.342E-01	BI214
1461.43	1160.	3.05	2.22	8.188E-03	1460.75	10.700	8.569E+00	K40
1764.87	83.	11.55	0.95	7.084E-03	1764.51	15.920	4.758E-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	
148.47	74.67	606.	255.	0.127	45.14	1.177	BI-207	D
154.30	77.58	545.	393.	0.196	29.41	1.180	PB-214	D
212.71	106.53	895.	144.	0.072	106.93	1.562	NP-239	l
417.47	208.92	426.	148.	0.074	70.60	1.620	AC-228	s
477.27	238.83	328.	923.	0.461	12.92	1.297	PB-212	D
483.19	241.79	412.	199.	0.100	48.14	1.299	PB-214	D
516.78	258.57	312.	83.	0.041	108.08	1.114	XE-138	l
656.98	328.68	212.	66.	0.033	111.65	1.495	LA-140	
1722.08	861.26	68.	59.	0.030	82.46	1.428	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	149.29	74.81	1406.	260.	0.130	62.88	1.500s
PB-214	153.89	77.11	1298.	353.	0.177	45.49	1.500D
PB-212	153.89	77.11	1294.	358.	0.179	45.49	1.500D
RA-226	371.71	186.03	541.	207.	0.104	58.15	1.546s
TH-227	471.93	236.15	1018.	-123.	-0.061	113.72	1.500s
PB-212	477.25	238.81	791.	865.	0.432	16.80	1.500s
RA-224	483.12	241.74	817.	129.	0.065	95.83	1.500s
PB-214	590.47	295.42	320.	290.	0.145	31.03	1.500
AC-228	676.88	338.63	204.	200.	0.100	39.25	1.509s
PB-214	703.88	352.14	211.	466.	0.233	18.92	1.500s
SB-125	926.37	463.39	123.	49.	0.025	98.94	1.500s
TL-208	1021.59	511.00	131.	138.	0.069	36.30	2.778s
TL-208	1166.59	583.51	137.	332.	0.166	24.95	1.515
BI-214	1218.93	609.68	64.	400.	0.200	17.52	1.719
BI-212	1454.49	727.46	81.	79.	0.039	67.08	0.894s
CS-134	1590.66	795.55	42.	51.	0.026	67.23	1.684s
AC-228	1822.77	911.60	75.	314.	0.157	23.98	1.672s
AC-228	1936.25	968.34	69.	192.	0.096	31.81	1.651s
BI-214	2241.80	1121.12	85.	100.	0.050	60.89	2.580s
K-40	2922.46	1461.43	25.	1155.	0.577	9.14	2.223
BI-214	3529.40	1764.87	3.	83.	0.041	34.64	0.948s

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		1.0711E-02					
			477.56	1.071E-02	&(	1.514E-01 4.35E-02	G
K-40		8.5691E+00					
			1460.75	8.569E+00	(P	1.934E-01 2.62E-01	G
MN-54		-6.4342E-03					
			834.81	-6.434E-03	%(P	2.466E-02 7.26E-03	G
CO-57		-1.0556E-02					
			122.07	-1.056E-02	%(P	2.848E-02 8.60E-03	G K
			136.43	-8.475E-03	% P	2.316E-01 6.90E-02	G
CO-60		4.0005E-03					
			1332.51	4.001E-03	&(P	2.235E-02 6.25E-03	G K
			1173.23	-1.888E-03	& P	3.672E-02 1.04E-02	G K
Sr-85		-1.3338E-02					
			514.00	-1.334E-02	%(	2.956E-02 8.95E-03	G
Kr-85		-3.1887E+02					
			513.99	-3.189E+02	%(P	6.547E+02 1.97E+02	G
Y-88		-3.1257E-03					
			1836.01	-3.126E-03	%(P	2.056E-02 5.50E-03	G K
			898.02	-5.014E-03	& P	2.493E-02 7.16E-03	G
NB-94		4.5296E-03					
			871.10	4.530E-03	&(P	1.941E-02 5.66E-03	G K
			702.50	-1.153E-04	% P	2.020E-02 5.74E-03	G K
Ag-108M		-9.8754E-03					
			722.95	-9.875E-03	%(	3.014E-02 9.01E-03	G K
			614.37	-1.469E-02	%	2.742E-02 8.36E-03	G
			433.93	5.077E-03	% P	1.907E-02 5.64E-03	G
CD-109		1.7932E-01					
			88.04	1.793E-01	%(P	6.758E-01 2.03E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SN-113	-2.0279E-03						
		391.71	-2.028E-03	&(P	2.428E-02	6.97E-03	G K
		255.04	-4.029E-02	%	1.022E+00	3.02E-01	G
SB-125	4.0148E-02						
		427.95	-1.597E-03	&(P	6.496E-02	1.88E-02	G K
		600.77	-3.048E-03	% P	1.121E-01	3.20E-02	G
		636.15	-2.328E-03	& P	1.393E-01	3.89E-02	G
		463.51	1.637E-01	(P	1.817E-01	5.71E-02	G
		176.29	1.353E-03	% P	3.301E-01	9.78E-02	G
I-131	-4.2833E-03						
		364.48	-4.283E-03	&(	3.230E-02	9.51E-03	G K
		636.97	-6.295E-02	%	4.311E-01	1.26E-01	G
		284.29	6.402E-02	%	4.945E-01	1.47E-01	G
CS-134	8.0295E-03						
		604.66	-1.171E-02	%(P	2.629E-02	7.93E-03	G K
		795.76	3.059E-02	*(P	1.964E-02	6.93E-03	G
		569.29	-5.719E-03	%	1.399E-01	4.05E-02	G
		801.84	-1.566E-03	% P	2.831E-01	8.10E-02	G
CS-137	-1.5705E-03						
		661.62	-1.570E-03	%(P	2.729E-02	7.74E-03	G
CE-139	-2.3985E-03						
		165.85	-2.399E-03	&(P	2.884E-02	8.60E-03	G
EU-152	-2.6576E-02						
		121.78	-2.658E-02	%(P	8.406E-02	2.53E-02	G K
		344.30	-1.802E-03	% P	7.639E-02	2.24E-02	G
		1408.08	1.935E-02	& P	8.792E-02	2.49E-02	G
		964.00	-2.251E-02	& P	2.406E-01	7.03E-02	G
		1112.07	-2.450E-03	% P	2.301E-01	6.57E-02	G
		778.90	-3.820E-02	% P	1.697E-01	4.96E-02	G
EU-154	1.1270E-02						
		123.10	1.127E-02	&(P	5.847E-02	1.75E-02	G K
		1274.80	1.144E-02	& P	7.250E-02	2.09E-02	G
		723.30	-4.795E-02	& P	1.444E-01	4.31E-02	G
		1004.80	3.917E-02	& P	1.125E-01	3.34E-02	G
EU-155	6.6054E-02						
		86.45	6.605E-02	&(	1.022E-01	3.12E-02	G K
		105.31	6.318E-02	% P	1.206E-01	3.66E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
HG-203	2.4675E-04						
		279.17	2.467E-04	&(P	2.530E-02	7.43E-03	G K
		72.87	-5.234E-01	& P	7.955E-01	2.42E-01	G
		70.83	-6.481E-01	%	1.262E+00	3.83E-01	G
		82.50	-2.506E-01	%	1.611E+00	4.83E-01	G
TL-208	1.5433E-01						
		583.14	1.543E-01	(P	2.653E-02	1.30E-02	G
		510.72	2.213E-01	+ P	8.945E-02	3.33E-02	G
PB-212	4.2086E-01						
		238.63	4.091E-01	*(P	6.329E-02	2.33E-02	G K
							Energy duplication
		77.11	4.497E-01	*(	2.140E-01	6.82E-02	G
		74.81	6.192E-01	& P	4.219E-01	1.32E-01	G
PB-214	3.4267E-01						
		351.99	3.366E-01	@(P	5.084E-02	2.15E-02	G K
		295.22	3.544E-01	(P	1.054E-01	3.72E-02	G
							Energy duplication
		77.11	7.257E-01	+ P	3.507E-01	1.12E-01	G
		241.92	2.674E-01	% P	3.869E-01	1.18E-01	G
BI-212	3.1565E-01						
		727.17	3.157E-01	*(P	1.794E-01	7.18E-02	G K
		1620.56	1.885E-01	& P	6.342E-01	1.82E-01	G
		785.42	1.551E-01	% P	1.126E+00	3.26E-01	G
BI-214	3.5894E-01						
		609.32	3.589E-01	(P	3.572E-02	2.12E-02	G K
		1764.51	4.758E-01	+ P	6.587E-02	5.55E-02	G
		1120.28	4.342E-01	+ P	1.980E-01	8.90E-02	G
RA-224	6.7923E-01						
		241.00	6.792E-01	&(P	7.148E-01	2.21E-01	G
RA-226	1.1379E+00						
		185.99	1.138E+00	*(	6.100E-01	2.21E-01	G
AC-228	6.2092E-01						
		911.07	6.075E-01	*(P	8.295E-02	4.92E-02	G K
		968.90	6.432E-01	*(P	1.395E-01	6.90E-02	G
		338.40	4.326E-01	- P	1.501E-01	5.76E-02	G
TH-227	-2.2206E-01						
		236.00	-2.221E-01	?(P	2.737E-01	8.40E-02	G K
		256.25	5.822E-02	& P	2.998E-01	8.93E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
PA-234	3.2710E-02						
		98.44	3.271E-02	%(	1.068E-01	3.22E-02	G K
		946.00	3.105E-02	&	9.190E-02	2.72E-02	G
		131.28	1.433E-03	&	1.262E-01	3.76E-02	G
		94.67	-4.669E-02	%	2.000E-01	6.02E-02	G
		883.24	-3.604E-02	%	1.902E-01	5.55E-02	G
		926.70	2.659E-02	&	1.758E-01	5.05E-02	G
		569.26	-8.103E-03	%	2.066E-01	5.99E-02	G
TH-234	4.0925E-01						
		63.29	4.092E-01	&(P	1.246E+00	3.74E-01	G K
		92.80	6.035E-01	% P	1.029E+00	3.12E-01	G
		92.38	8.063E-01	% P	1.213E+00	3.70E-01	G
AM-241	-3.3057E-03						
		59.54	-3.306E-03	%(P	1.419E-01	4.22E-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	

- -

***** 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	1.0116E-02	1.0711E-02	1.3052E-01	1.3052E-01	1.430E-01
K-40		8.5691E+00	8.5691E+00	7.8681E-01	9.3552E-01	
MN-54	#A	-6.3716E-03	-6.4342E-03	2.3383E-02	2.3386E-02	2.442E-02
CO-57	#B	-1.0437E-02	-1.0556E-02	2.6071E-02	2.6077E-02	2.816E-02
CO-60	#B	3.9942E-03	4.0005E-03	1.8735E-02	1.8737E-02	2.232E-02
Sr-85	#A	-1.2725E-02	-1.3338E-02	2.6841E-02	2.6853E-02	2.820E-02
Kr-85	#A	-3.1886E+02	-3.1887E+02	6.9237E+02	6.9262E+02	6.547E+02
Y-88	#B	-3.0375E-03	-3.1257E-03	2.7813E-02	2.7814E-02	1.998E-02
NB-94	#B	4.5296E-03	4.5296E-03	1.6990E-02	1.6992E-02	1.941E-02
Ag-108M	#B	-9.8747E-03	-9.8754E-03	2.7030E-02	2.7037E-02	3.014E-02
CD-109	#A	1.7812E-01	1.7932E-01	6.0929E-01	6.0937E-01	6.712E-01
SN-113	#B	-1.9748E-03	-2.0279E-03	5.0818E-02	5.0818E-02	2.365E-02
SB-125	#B	4.0027E-02	4.0148E-02	4.2001E-02	4.2068E-02	6.477E-02
I-131	#B	-2.9299E-03	-4.2833E-03	2.8522E-02	2.8524E-02	2.210E-02
CS-134	#B	7.9970E-03	8.0295E-03	5.4539E-03	5.4745E-03	2.619E-02
CS-137	#A	-1.5701E-03	-1.5705E-03	2.9546E-01	2.9546E-01	2.728E-02
CE-139	#A	-2.3459E-03	-2.3985E-03	2.7474E-02	2.7474E-02	2.820E-02
EU-152	#B	-2.6559E-02	-2.6576E-02	7.6466E-02	7.6480E-02	8.400E-02
EU-154	#B	1.1259E-02	1.1270E-02	5.2594E-02	5.2598E-02	5.842E-02
EU-155	#B	6.5943E-02	6.6054E-02	9.3473E-02	9.3545E-02	1.020E-01
HG-203	#B	2.3110E-04	2.4675E-04	2.2294E-02	2.2294E-02	2.369E-02
TL-208		1.5433E-01	1.5433E-01	3.9037E-02	4.0087E-02	
PB-212	#	4.2086E-01	4.2086E-01	7.1985E-02	7.6156E-02	6.329E-02
PB-214	#	3.4267E-01	3.4267E-01	6.3162E-02	6.6325E-02	5.084E-02
BI-212	#	3.1565E-01	3.1565E-01	2.1521E-01	2.1602E-01	
BI-214		3.5894E-01	3.5894E-01	6.3559E-02	6.7001E-02	
RA-224	#A	6.7923E-01	6.7923E-01	6.6213E-01	6.6334E-01	7.148E-01
RA-226	#	1.1379E+00	1.1379E+00	6.6176E-01	6.6516E-01	
AC-228	#	6.2092E-01	6.2092E-01	1.2521E-01	1.3047E-01	
TH-227	#A	-2.2206E-01	-2.2206E-01	2.5309E-01	2.5343E-01	2.737E-01
PA-234	#B	3.2710E-02	3.2710E-02	9.6538E-02	9.6555E-02	1.068E-01
TH-234	#B	4.0925E-01	4.0925E-01	1.1232E+00	1.1234E+00	1.246E+00
AM-241	#A	-3.3057E-03	-3.3057E-03	1.9607E-01	1.9607E-01	1.419E-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 (258.2 to 2000.1 keV) 1.1156907E+01 pCi/gm
Total Decayed Activity (258.2 to 2000.1 keV) 1.1156913E+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_8AUG2006_1428.An1

Sample description
FSS-OOL-10-02-003-F-A

Spectrum Filename: C:\GammaVision\Spectra\101F_8AUG2006_1428.An1

Acquisition information

Start time:	08-Aug-2006 14:28:48
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:	1.8250E+03
Activity scaling factor:	1.0000E+06/(1.0000E+00* 1.8250E+03) = 5.4795E+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	07-Aug-2006 10:00:00
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. 7 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.5921

***** 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	70.	41.24	1.50	1.654E-02	74.81	9.600	PBC<MDA	PB212
77.30	88.	33.75	1.50	1.720E-02	77.11	10.700	PBC<MDA	PB214
					77.11	17.500	PBC<MDA	PB212
77.30	91.	33.75	1.50	1.720E-02	77.11	10.700	PBC<MDA	PB214
					77.11	17.500	2.250E-01	PB212
186.25	60.	26.46	1.05	1.857E-02	185.99	3.280	7.338E-01	RA226
239.19	286.	9.06	1.11	1.554E-02	238.63	43.100	3.089E-01	PB212
295.62	104.	21.36	1.04	1.290E-02	295.22	19.200	3.042E-01	PB214
338.47	61.	25.69	1.08	1.135E-02	338.40	12.010	3.217E-01	AC228
352.23	164.	12.75	1.10	1.092E-02	351.99	37.100	2.951E-01	PB214
463.41	21.	41.29	1.50	8.342E-03	463.51	10.000	PBC<MDA	SB125
511.37	14.	34.81	1.50	7.590E-03	510.72	22.500	PBC<MDA	TL208
583.75	87.	14.76	1.43	6.678E-03	583.14	86.000	1.090E-01	TL208
609.83	116.	12.00	1.56	6.408E-03	609.32	46.090	2.881E-01	BI214
728.19	17.	38.45	1.14	5.443E-03	727.17	11.800	PBC<MDA	BI212
912.31	31.	24.16	1.58	4.447E-03	911.07	29.000	1.774E-01	AC228
969.65	32.	27.94	1.62	4.212E-03	968.90	17.460	3.184E-01	AC228
1121.50	40.	27.15	1.35	3.711E-03	1120.28	15.040	5.309E-01	BI214
1462.11	303.	5.84	1.77	2.940E-03	1460.75	10.700	7.080E+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-214	153.79	77.11	435.	88.	0.044	101.26	1.499D
PB-212	153.79	77.11	431.	91.	0.046	101.26	1.499D
RA-226	372.09	186.22	193.	61.	0.030	104.21	1.499
PB-212	477.70	239.00	196.	184.	0.092	37.62	1.499
PB-214	590.86	295.55	94.	80.	0.040	60.18	1.499s
AC-228	677.58	338.90	67.	39.	0.019	95.74	1.499
PB-214	704.46	352.33	57.	122.	0.061	37.04	1.499
TL-208	1167.56	583.78	21.	70.	0.035	43.37	1.499
BI-214	1219.69	609.83	30.	115.	0.057	36.00	1.562
BI-212	1456.54	728.19	14.	17.	0.009	115.35	1.141
AC-228	1824.97	912.31	17.	31.	0.015	72.48	1.578s
AC-228	1939.71	969.65	25.	32.	0.016	83.82	1.616s
BI-214	2243.60	1121.50	22.	40.	0.020	81.45	1.349s
K-40	2925.24	1462.11	5.	301.	0.151	17.51	1.771

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		1.0535E-01					
			477.56	1.053E-01	%(	2.533E-01 7.60E-02	G
K-40		7.0796E+00					
			1460.75	7.080E+00	(P	3.083E-01 4.17E-01	G
MN-54		-6.5878E-03					
			834.81	-6.588E-03	&(P	3.885E-02 1.09E-02	G
CO-57		7.9526E-03					
			122.07	7.953E-03	%(	3.212E-02 9.58E-03	G K
			136.43	-2.246E-03	%	2.669E-01 7.83E-02	G
CO-60		-2.4528E-03					
			1332.51	-2.453E-03	%(P	4.975E-02 1.34E-02	G K
			1173.23	6.436E-04	& P	5.333E-02 1.45E-02	G K
Sr-85		-8.3265E-03					
			514.00	-8.327E-03	&(	3.593E-02 1.05E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
Kr-85	-2.1636E+02						
		513.99	-2.164E+02	&(P	8.275E+02	2.39E+02	G
Y-88	0.0000E+00						
		1836.01	0.000E+00	&(	2.314E-02	3.14E-03	G K
		898.02	-2.894E-04	& P	3.373E-02	8.73E-03	G
NB-94	1.0475E-02						
		871.10	1.048E-02	%(P	2.609E-02	7.75E-03	G K
		702.50	-2.701E-03	& P	3.048E-02	8.37E-03	G K
Ag-108M	0.0000E+00						
		722.95	0.000E+00	&(	4.462E-02	1.23E-02	G K
		614.37	-2.001E-02	& P	5.104E-02	1.53E-02	G
		433.93	7.061E-03	%	2.640E-02	7.69E-03	G
CD-109	-6.1818E-03						
		88.04	-6.182E-03	%(P	9.830E-01	2.90E-01	G
SN-113	-6.6586E-03						
		391.71	-6.659E-03	%(	4.278E-02	1.23E-02	G K
		255.04	-4.546E-03	% P	1.338E+00	3.86E-01	G
SB-125	-4.9991E-03						
		427.95	-4.999E-03	%(P	7.882E-02	2.18E-02	G K
		600.77	-1.923E-02	% P	1.675E-01	4.67E-02	G
		636.15	1.132E-02	% P	2.855E-01	7.84E-02	G
		463.51	1.870E-01	% P	2.631E-01	8.25E-02	G
		176.29	-1.212E-01	% P	4.497E-01	1.33E-01	G
I-131	-2.8645E-03						
		364.48	-2.865E-03	&(	2.503E-02	7.01E-03	G K
		636.97	6.583E-03	%	3.726E-01	9.86E-02	G
		284.29	0.000E+00	%	5.638E-01	1.63E-01	G
CS-134	1.1014E-02						
		604.66	1.101E-02	&(P	2.744E-02	8.14E-03	G K
		795.76	-8.173E-04	% P	3.462E-02	8.95E-03	G
		569.29	-3.216E-02	& P	1.977E-01	5.57E-02	G
		801.84	4.476E-02	&	3.372E-01	9.25E-02	G
CS-137	-3.8672E-03						
		661.62	-3.867E-03	%(P	3.609E-02	9.74E-03	G
CE-139	6.1228E-03						
		165.85	6.123E-03	%(P	2.977E-02	8.81E-03	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
EU-152	1.9908E-02						
		121.78	1.991E-02	%(P	9.741E-02	2.90E-02	G K
		344.30	-1.206E-02	% P	9.096E-02	2.59E-02	G
		1408.08	-9.157E-03	& P	2.032E-01	5.26E-02	G
		964.00	-7.268E-02	& P	3.477E-01	9.91E-02	G
		1112.07	3.181E-03	& P	3.474E-01	9.35E-02	G
		778.90	1.189E-03	% P	2.320E-01	6.12E-02	G
EU-154	-6.5632E-04						
		123.10	-6.563E-04	&(P	7.076E-02	2.07E-02	G K
		1274.80	-1.638E-03	% P	1.117E-01	2.89E-02	G
		723.30	-2.886E-03	& P	1.239E-01	3.14E-02	G
		1004.80	-1.947E-02	& P	2.572E-01	7.09E-02	G
EU-155	8.9173E-03						
		86.45	8.917E-03	&(	9.739E-02	2.88E-02	G K
		105.31	8.227E-03	%	1.365E-01	4.02E-02	G
HG-203	-4.3507E-04						
		279.17	-4.351E-04	&(	3.272E-02	9.39E-03	G K
		72.87	-6.145E-03	& P	7.660E-01	2.26E-01	G
		70.83	-2.844E-03	%	1.317E+00	3.88E-01	G
		82.50	-1.392E-02	&	1.532E+00	4.50E-01	G
TL-208	9.0781E-02						
		583.14	9.078E-02	(P	3.126E-02	1.36E-02	G
		510.72	5.999E-02	& P	1.618E-01	4.51E-02	G
PB-212	2.0939E-01						
		238.63	2.031E-01	(P	7.489E-02	2.63E-02	G K
							Energy duplication
		77.11	2.250E-01	(	2.446E-01	7.59E-02	G
		74.81	3.257E-01	& P	4.723E-01	1.44E-01	G
PB-214	2.2767E-01						
		351.99	2.225E-01	(P	6.912E-02	2.79E-02	G K
		295.22	2.377E-01	@(P	1.433E-01	4.88E-02	G
							Energy duplication
		77.11	3.530E-01	+ P	4.017E-01	1.24E-01	G
		241.92	1.571E-02	% P	5.113E-01	1.50E-01	G
BI-212	1.9740E-01						
		727.17	1.974E-01	(P	2.314E-01	7.90E-02	G K
		1620.56	3.960E-01	%	1.197E+00	3.44E-01	G
		785.42	4.152E-01	% P	1.508E+00	4.33E-01	G
BI-214	2.8809E-01						
		609.32	2.881E-01	(P	7.074E-02	3.49E-02	G K
		1764.51	1.545E-01	& P	2.043E-01	7.01E-02	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                         1120.28 5.309E-01 + P 3.258E-01 1.46E-01 G

RA-224       3.8296E-01
                          241.00 3.830E-01 &(P 8.475E-01 2.56E-01 G

RA-226       7.3943E-01
                          185.99 7.394E-01  (  8.196E-01 2.57E-01 G

AC-228       2.2644E-01
                          911.07 1.774E-01 *(P 1.253E-01 4.55E-02 G K
                          968.90 3.184E-01  (P 2.636E-01 9.10E-02 G
                          338.40 2.111E-01  (P 2.226E-01 7.12E-02 G

TH-227      -9.7402E-02
                          236.00-9.740E-02 %(P 3.202E-01 9.57E-02 G K
                          256.25-4.279E-02 & P 3.913E-01 1.13E-01 G

PA-234      -3.5188E-02
                           98.44-3.519E-02 %(  1.143E-01 3.42E-02 G K
                          946.00 3.510E-02 %   1.989E-01 5.60E-02 G
                          131.28-3.547E-03 %   1.400E-01 4.11E-02 G
                           94.67 3.541E-02 &   2.078E-01 6.18E-02 G
                          883.24-3.504E-02 %   2.710E-01 7.44E-02 G
                          926.70 8.414E-02 %   3.103E-01 8.91E-02 G
                          569.26-3.840E-02 &   2.866E-01 8.09E-02 G

TH-234      -4.2588E-03
                           63.29-4.259E-03 %(P 1.520E+00 4.45E-01 G K
                           92.80 6.608E-01 % P 1.100E+00 3.35E-01 G
                           92.38 2.340E-01 % P 1.158E+00 3.41E-01 G

AM-241       1.3994E-04
                           59.54 1.399E-04 &(P 2.026E-01 5.95E-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	1.0374E-01	1.0535E-01	2.2800E-01	2.2808E-01	2.495E-01
K-40		7.0796E+00	7.0796E+00	1.2488E+00	1.3113E+00	
MN-54	#A	-6.5705E-03	-6.5878E-03	3.9648E-02	3.9650E-02	3.875E-02
CO-57	#B	7.9285E-03	7.9526E-03	2.8743E-02	2.8747E-02	3.202E-02
CO-60	#B	-2.4518E-03	-2.4528E-03	4.7211E-02	4.7211E-02	4.973E-02
Sr-85	#A	-8.2215E-03	-8.3265E-03	3.1454E-02	3.1457E-02	3.547E-02
Kr-85	#A	-2.1636E+02	-2.1636E+02	9.1997E+02	9.2005E+02	8.275E+02
Y-88	#B	0.0000E+00	0.0000E+00	9.4211E-03	9.4228E-03	2.297E-02
NB-94	#B	1.0475E-02	1.0475E-02	2.3237E-02	2.3244E-02	2.609E-02
Ag-108M	#B	0.0000E+00	0.0000E+00	3.6931E-02	3.6931E-02	4.462E-02
CD-109	#A	-6.1706E-03	-6.1818E-03	6.6300E+00	6.6300E+00	9.812E-01
SN-113	#B	-6.6112E-03	-6.6586E-03	3.7006E-02	3.7008E-02	4.248E-02
SB-125	#B	-4.9950E-03	-4.9991E-03	9.4221E-02	9.4222E-02	7.875E-02
I-131	#B	-2.5860E-03	-2.8645E-03	2.1027E-02	2.1027E-02	2.260E-02
CS-134	#B	1.1002E-02	1.1014E-02	2.4423E-02	2.4431E-02	2.741E-02
CS-137	#A	-3.8669E-03	-3.8672E-03	5.8892E-02	5.8892E-02	3.608E-02
CE-139	#A	6.0863E-03	6.1228E-03	2.6425E-02	2.6427E-02	2.959E-02
EU-152	#B	1.9904E-02	1.9908E-02	8.6915E-02	8.6922E-02	9.739E-02
EU-154	#B	-6.5615E-04	-6.5632E-04	6.7259E-01	6.7259E-01	7.074E-02
EU-155	#B	8.9133E-03	8.9173E-03	8.6298E-02	8.6299E-02	9.735E-02
HG-203	#B	-4.2746E-04	-4.3507E-04	2.8162E-02	2.8162E-02	3.215E-02
TL-208	#	9.0781E-02	9.0781E-02	4.0695E-02	4.1017E-02	3.126E-02
PB-212	#	2.0939E-01	2.0939E-01	8.1412E-02	8.2267E-02	7.489E-02
PB-214	#	2.2767E-01	2.2767E-01	8.2106E-02	8.3107E-02	6.912E-02
BI-212	A	1.9740E-01	1.9740E-01	2.3671E-01	2.3697E-01	
BI-214		2.8809E-01	2.8809E-01	1.0472E-01	1.0598E-01	
RA-224	#A	3.8296E-01	3.8296E-01	7.6868E-01	7.6898E-01	8.475E-01
RA-226	#A	7.3943E-01	7.3943E-01	7.7057E-01	7.7170E-01	8.196E-01
AC-228	#	2.2644E-01	2.2644E-01	1.1567E-01	1.1637E-01	1.253E-01

TH-227 #B	-9.7402E-02	-9.7402E-02	2.9827E-01	2.9832E-01	3.202E-01

PA-234 #B	-3.5188E-02	-3.5188E-02	1.0272E-01	1.0274E-01	1.143E-01
TH-234 #B	-4.2588E-03	-4.2588E-03	1.4165E+00	1.4165E+00	1.520E+00
AM-241 #A	1.3994E-04	1.3994E-04	1.7845E-01	1.7845E-01	2.026E-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) 7.5650511E+00 pCi/gm
Total Decayed Activity (50.2 to 1999.1 keV) 7.5650511E+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: 101F_8AUG2006_1507.An1

Sample description
FSS-OOL-10-02-010-F-A

Spectrum Filename: C:\GammaVision\Spectra\101F_8AUG2006_1507.An1

Acquisition information
Start time: 08-Aug-2006 15:07:49
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: 1.8320E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.8320E+03) =
5.4585E+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	07-Aug-2006 13:05:00
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. 9 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.6113

***** 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
77.06	124.	23.19	1.50	1.720E-02	77.11	10.700	4.960E-01	PB214
					77.11	17.500	PBC<MDA	PB212
77.06	128.	23.19	1.50	1.720E-02	77.11	10.700	4.960E-01	PB214
					77.11	17.500	3.124E-01	PB212
87.80	84.	31.70	1.27	1.929E-02				
87.80	84.	31.70	1.27	1.929E-02	88.04	3.790	PBC<MDA	CD109
93.33	68.	34.33	1.45	1.995E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
					94.67	15.500	1.621E-01	PA234
186.67	62.	34.86	1.24	1.854E-02	185.99	3.280	7.503E-01	RA226
239.04	266.	7.43	1.12	1.555E-02	238.63	43.100	2.856E-01	PB212
242.23	51.	27.78	1.12	1.539E-02	241.00	3.900	PBC<MDA	RA224
295.64	84.	16.67	0.91	1.290E-02	295.22	19.200	2.445E-01	PB214
338.78	48.	26.35	1.09	1.134E-02	338.40	12.010	2.501E-01	AC228
352.18	155.	11.11	1.51	1.092E-02	351.99	37.100	2.790E-01	PB214
563.05	29.	32.53	0.69	6.911E-03				
583.75	80.	18.85	1.38	6.678E-03	583.14	86.000	1.002E-01	TL208
609.94	103.	12.40	1.45	6.407E-03	609.32	46.090	2.543E-01	BI214
911.88	59.	18.02	1.34	4.443E-03	911.07	29.000	3.268E-01	AC228
1121.43	60.	18.95	2.08	3.711E-03	1120.28	15.040	7.946E-01	BI214
1462.07	273.	6.05	1.57	2.940E-03	1460.75	10.700	6.343E+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

477.78	239.00	62.	266.	0.133	22.28	1.122	PB-212	D

Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM	Suspected	
484.17	242.19	77.	51.	0.026	83.33	1.124	PB-214	D
1126.09	563.05	16.	33.	0.016	74.20	0.693	CS-134	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	377.	124.	0.062	69.57	1.499D
PB-212	153.79	77.11	373.	128.	0.064	69.57	1.499D
CD-109	174.14	87.28	304.	74.	0.037	105.57	1.499s
TH-234	185.82	93.12	334.	71.	0.035	105.81	1.499s
PA-234	185.73	93.07	242.	82.	0.041	87.05	1.499s
RA-226	372.35	186.35	200.	62.	0.031	103.35	1.499
PB-212	477.61	238.96	191.	200.	0.100	34.98	1.499
PB-214	590.97	295.61	63.	81.	0.040	52.04	1.499
AC-228	677.31	338.76	67.	33.	0.016	109.53	1.499
PB-214	704.68	352.44	59.	135.	0.068	34.61	1.499s
TL-208	1167.30	583.64	30.	57.	0.028	54.23	1.499s
BI-214	1219.91	609.94	25.	102.	0.051	37.19	1.446
AC-228	1824.63	912.14	18.	47.	0.023	55.33	1.578
BI-214	2243.46	1121.43	17.	60.	0.030	56.85	2.084s
K-40	2925.26	1462.12	5.	267.	0.134	18.59	1.574

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		7.0113E-02					
			477.56	7.011E-02	%(	2.063E-01	6.07E-02 G
K-40		6.2583E+00					
			1460.75	6.258E+00	(P	3.047E-01	3.91E-01 G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
MN-54	-6.4300E-04						
		834.81	-6.430E-04	&(P	4.007E-02	1.08E-02	G
CO-57	3.1695E-04						
		122.07	3.170E-04	%(	3.115E-02	9.12E-03	G K
		136.43	3.934E-02	&	2.448E-01	7.25E-02	G
CO-60	-8.7434E-04						
		1332.51	-8.743E-04	%(P	4.732E-02	1.25E-02	G K
		1173.23	1.914E-02	& P	4.604E-02	1.38E-02	G K
Sr-85	1.7469E-02						
		514.00	1.747E-02	&(	3.351E-02	1.02E-02	G
Kr-85	4.1541E+02						
		513.99	4.154E+02	&(P	7.482E+02	2.29E+02	G
Y-88	-3.9467E-03						
		1836.01	-3.947E-03	%(	4.727E-02	1.23E-02	G K
		898.02	4.367E-03	& P	3.282E-02	8.92E-03	G
NB-94	5.3091E-03						
		871.10	5.309E-03	%(P	3.379E-02	9.39E-03	G K
		702.50	-5.836E-05	& P	5.080E-02	1.43E-02	G K
Ag-108M	-6.3949E-03						
		722.95	-6.395E-03	&(	4.092E-02	1.16E-02	G K
		614.37	-1.603E-02	& P	4.899E-02	1.45E-02	G
		433.93	5.554E-03	&	2.008E-02	5.79E-03	G
CD-109	7.4384E-01						
		88.04	7.438E-01	(P	8.474E-01	2.63E-01	G
SN-113	-4.0478E-05						
		391.71	-4.048E-05	%(	3.134E-02	8.55E-03	G K
		255.04	-1.321E-01	% P	1.234E+00	3.58E-01	G
SB-125	-9.0103E-04						
		427.95	-9.010E-04	&(P	1.039E-01	2.92E-02	G K
		600.77	3.115E-02	& P	1.654E-01	4.71E-02	G
		636.15	-2.836E-02	% P	2.742E-01	7.58E-02	G
		463.51	1.152E-01	% P	2.128E-01	6.47E-02	G
		176.29	-1.172E-02	& P	4.484E-01	1.30E-01	G
I-131	7.3967E-07						
		364.48	7.397E-07	%(	3.519E-02	9.90E-03	G K
		636.97	0.000E+00	%	6.303E-01	1.76E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
		284.29	9.134E-02	%	4.101E-01	1.20E-01	G
CS-134	-7.2420E-04						
		604.66	-7.242E-04	&(P	5.129E-02	1.45E-02	G K
		795.76	-7.198E-04	% P	4.474E-02	1.21E-02	G
		569.29	-3.287E-02	& P	2.103E-01	5.95E-02	G
		801.84	-5.678E-02	%	3.928E-01	1.10E-01	G
CS-137	1.2111E-03						
		661.62	1.211E-03	%(P	3.773E-02	1.02E-02	G
CE-139	2.0347E-04						
		165.85	2.035E-04	%(P	2.678E-02	7.74E-03	G
EU-152	5.0855E-03						
		121.78	5.086E-03	%(P	8.921E-02	2.62E-02	G K
		344.30	-3.458E-03	% P	7.519E-02	2.07E-02	G
		1408.08	-1.490E-03	& P	2.049E-01	5.24E-02	G
		964.00	-1.247E-02	% P	2.914E-01	7.83E-02	G
		1112.07	-5.711E-02	% P	3.715E-01	1.05E-01	G
		778.90	-1.075E-02	% P	2.624E-01	7.11E-02	G
EU-154	-1.1913E-02						
		123.10	-1.191E-02	%(P	6.631E-02	1.96E-02	G K
		1274.80	-1.095E-02	% P	1.469E-01	4.03E-02	G
		723.30	-3.588E-02	& P	1.892E-01	5.36E-02	G
		1004.80	-5.584E-02	% P	2.636E-01	7.53E-02	G
EU-155	-8.7952E-03						
		86.45	-8.795E-03	%(	1.169E-01	3.47E-02	G K
		105.31	7.991E-02	&	1.187E-01	3.65E-02	G
HG-203	2.7033E-03						
		279.17	2.703E-03	%(	3.186E-02	9.21E-03	G K
		72.87	-7.485E-02	% P	5.996E-01	1.76E-01	G
		70.83	-4.178E-01	%	1.342E+00	4.03E-01	G
		82.50	1.067E-01	%	1.657E+00	4.90E-01	G
TL-208	7.2587E-02						
		583.14	7.259E-02	*(P	3.604E-02	1.37E-02	G
		510.72	2.580E-02	% P	1.794E-01	4.90E-02	G
PB-212	2.1948E-01						
		238.63	2.195E-01	(P	7.383E-02	2.64E-02	G K
							Energy duplication
		77.11	3.124E-01	+	2.273E-01	7.24E-02	G
		74.81	2.236E-01	& P	4.627E-01	1.40E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
PB-214	2.4411E-01						
		351.99	2.462E-01	*(P	6.990E-02	2.88E-02	G K
		295.22	2.401E-01	(P	1.180E-01	4.26E-02	G
							Energy duplication
		77.11	4.960E-01	+ P	3.735E-01	1.18E-01	G
		241.92	-9.634E-02	% P	4.495E-01	1.33E-01	G
BI-212	1.0540E-01						
		727.17	1.054E-01	%(P	2.703E-01	7.99E-02	G K
		1620.56	-1.333E-01	%	1.287E+00	3.29E-01	G
		785.42	2.428E-01	% P	1.726E+00	4.82E-01	G
BI-214	2.5429E-01						
		609.32	2.543E-01	(P	6.504E-02	3.19E-02	G K
		1764.51	-8.175E-03	% P	4.245E-01	1.12E-01	G
		1120.28	7.946E-01	+ P	2.889E-01	1.52E-01	G
RA-224	-1.7594E-02						
		241.00	-1.759E-02	&(P	9.330E-01	2.73E-01	G
RA-226	7.5593E-01						
		185.99	7.559E-01	(	8.310E-01	2.60E-01	G
AC-228	2.6713E-01						
		911.07	2.671E-01	(P	1.277E-01	5.12E-02	G K
		968.90	1.485E-01	% P	2.184E-01	6.92E-02	G
		338.40	1.785E-01	- P	2.212E-01	6.95E-02	G
TH-227	-3.5007E-03						
		236.00	-3.501E-03	%(P	2.714E-01	7.89E-02	G K
		256.25	6.632E-04	& P	3.886E-01	1.12E-01	G
PA-234	9.3259E-02						
		98.44	3.073E-02	%(	1.160E-01	3.47E-02	G K
		946.00	-1.236E-02	%	1.896E-01	5.15E-02	G
		131.28	1.228E-03	&	1.459E-01	4.29E-02	G
		94.67	1.945E-01	&(	1.784E-01	5.64E-02	G
		883.24	-7.717E-05	%	2.040E-01	5.09E-02	G
		926.70	0.000E+00	%	5.059E-01	1.41E-01	G
		569.26	-4.406E-02	&	3.099E-01	8.81E-02	G
TH-234	6.7855E-01						
		63.29	5.299E-01	%(P	1.425E+00	4.26E-01	G K
		92.80	8.718E-01	(P	1.086E+00	3.34E-01	G
		92.38	-2.955E-01	% P	1.372E+00	4.01E-01	G

Nuclide Ave activity Energy Activity Code Peak MDA Comments

AM-241 -6.4318E-02
59.54-6.432E-02 %(P 1.961E-01 5.87E-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	6.9132E-02	7.0113E-02	1.8197E-01	1.8201E-01	2.034E-01
K-40		6.2583E+00	6.2583E+00	1.1735E+00	1.2256E+00	
MN-54	#A	-6.4145E-04	-6.4300E-04	2.7084E-02	2.7084E-02	3.998E-02
CO-57	#B	3.1607E-04	3.1695E-04	2.7371E-02	2.7371E-02	3.106E-02
CO-60	#B	-8.7400E-04	-8.7434E-04	5.9743E-02	5.9743E-02	4.731E-02
Sr-85	#A	1.7267E-02	1.7469E-02	3.0713E-02	3.0729E-02	3.312E-02
Kr-85	#A	4.1540E+02	4.1541E+02	6.8578E+02	6.8618E+02	7.482E+02
Y-88	#B	-3.9190E-03	-3.9467E-03	3.6865E-02	3.6866E-02	4.694E-02
NB-94	#B	5.3091E-03	5.3091E-03	2.8161E-02	2.8163E-02	3.379E-02
Ag-108M	#B	-6.3948E-03	-6.3949E-03	3.4836E-02	3.4838E-02	4.092E-02
CD-109	#A	7.4261E-01	7.4384E-01	7.9025E-01	7.9132E-01	8.460E-01

SN-113	#B	-4.0214E-05	-4.0478E-05	2.5637E-02	2.5637E-02	3.113E-02
SB-125	#B	-9.0036E-04	-9.0103E-04	5.7024E-02	5.7024E-02	1.038E-01
I-131	#B	6.7361E-07	7.3967E-07	2.9708E-02	2.9708E-02	3.205E-02
CS-134	#B	-7.2347E-04	-7.2420E-04	5.3956E-02	5.3956E-02	5.124E-02
CS-137	#A	1.2110E-03	1.2111E-03	3.0713E-02	3.0713E-02	3.773E-02
CE-139	#A	2.0236E-04	2.0347E-04	2.3228E-02	2.3228E-02	2.664E-02
EU-152	#B	5.0847E-03	5.0855E-03	7.8557E-02	7.8557E-02	8.919E-02
EU-154	#B	-1.1910E-02	-1.1913E-02	6.7205E-02	6.7208E-02	6.629E-02
EU-155	#B	-8.7916E-03	-8.7952E-03	1.0400E-01	1.0401E-01	1.169E-01
HG-203	#B	2.6600E-03	2.7033E-03	2.7641E-02	2.7642E-02	3.135E-02
TL-208	#	7.2587E-02	7.2587E-02	4.1015E-02	4.1220E-02	3.604E-02
PB-212	#	2.1948E-01	2.1948E-01	7.9147E-02	8.0113E-02	7.383E-02
PB-214	#	2.4411E-01	2.4411E-01	7.7784E-02	7.8997E-02	6.990E-02
BI-212	#B	1.0540E-01	1.0540E-01	2.3981E-01	2.3988E-01	2.703E-01
BI-214		2.5429E-01	2.5429E-01	9.5590E-02	9.6664E-02	
RA-224	#A	-1.7594E-02	-1.7594E-02	2.4403E+00	2.4403E+00	9.330E-01
RA-226	#A	7.5593E-01	7.5593E-01	7.8129E-01	7.8246E-01	8.310E-01
AC-228	#	2.6713E-01	2.6713E-01	1.5372E-01	1.5446E-01	1.277E-01
TH-227	#B	-3.5007E-03	-3.5007E-03	7.5347E-01	7.5347E-01	2.714E-01
PA-234	#B	9.3259E-02	9.3259E-02	8.1178E-02	8.1342E-02	1.160E-01
TH-234	#B	6.7855E-01	6.7855E-01	7.8088E-01	7.8179E-01	1.425E+00
AM-241	#A	-6.4318E-02	-6.4318E-02	1.8815E-01	1.8819E-01	1.961E-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 (295.6 to 1999.1 keV) 6.5125694E+00 pCi/gm
Total Decayed Activity (295.6 to 1999.1 keV) 6.5125694E+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: 101F_9AUG2006_1600.An1

Sample description
FSS-OOL-10-02-004-F

Spectrum Filename: C:\GammaVision\Spectra\101F_9AUG2006_1600.An1

Acquisition information

Start time:	09-Aug-2006 16:00:08
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:	1.7540E+03
Activity scaling factor:	1.0000E+06/(1.0000E+00* 1.7540E+03) = 5.7013E+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	07-Aug-2006 11:06:00
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: 0.5964

***** 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	256.	12.95	1.00	1.659E-02	74.81	9.600	1.217E+00	PB212
77.13	408.	9.06	1.01	1.723E-02	77.11	17.500	1.044E+00	PB212
					77.11	10.700	1.692E+00	PB214
83.58	80.	41.30	0.67	1.863E-02				
87.38	159.	18.44	1.01	1.927E-02	86.45	32.740	1.967E-01	EU155
					88.04	3.790	PBC<MDA	CD109
89.64	114.	25.49	1.02	1.956E-02				
93.58	114.	26.16	1.02	2.000E-02	92.80	3.000	PBC<MDA	TH234
185.82	166.	21.16	1.27	1.859E-02	185.99	3.280	2.092E+00	RA226
209.90	119.	28.23	0.98	1.718E-02				
238.99	793.	4.17	1.12	1.556E-02	238.63	43.100	9.035E-01	PB212
242.01	105.	20.08	1.12	1.540E-02	241.00	3.900	PBC<MDA	RA224
					241.92	7.470	PBC<MDA	PB214
258.26	66.	38.84	0.86	1.457E-02				
270.48	91.	24.61	1.60	1.399E-02				
277.70	67.	32.94	1.33	1.367E-02				
295.52	215.	10.89	1.21	1.291E-02	295.22	19.200	6.616E-01	PB214
300.73	60.	29.54	1.47	1.270E-02				
327.66	72.	32.90	0.90	1.171E-02				
338.73	140.	16.22	1.17	1.134E-02	338.40	12.010	7.818E-01	AC228
352.37	349.	7.15	1.24	1.091E-02	351.99	37.100	6.589E-01	PB214
463.53	92.	22.39	1.30	8.341E-03	463.51	10.000	8.376E-01	SB125
511.04	101.	18.50	1.81	7.586E-03	510.72	22.500	3.824E-01	TL208
583.68	292.	8.66	1.42	6.679E-03	583.14	86.000	3.888E-01	TL208
609.92	275.	8.22	1.12	6.407E-03	609.32	46.090	7.150E-01	BI214
727.80	34.	31.36	1.50	5.443E-03	727.17	11.800	4.091E-01	BI212
795.17	61.	23.26	0.86	5.019E-03				

795.17	61.	23.26	0.86	5.019E-03	795.76	85.400	1.092E-01	CS134
912.32	152.	11.97	1.59	4.441E-03	911.07	29.000	8.982E-01	AC228
969.03	122.	15.90	1.64	4.212E-03	968.90	17.460	1.273E+00	AC228
1121.97	78.	20.07	1.68	3.706E-03	1120.28	15.040	1.078E+00	BI214
1462.03	578.	4.21	1.97	2.940E-03	1460.75	10.700	1.408E+01	K40
1765.96	37.	16.44	1.44	2.479E-03	1764.51	15.920	7.131E-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	
149.35	74.98	421.	256.	0.128	38.84	1.005	PB-214	D
153.82	77.22	479.	408.	0.204	27.17	1.006	PB-214	D
174.34	87.63	353.	159.	0.080	55.32	1.014	PB-214	lD
178.86	89.89	365.	114.	0.057	76.47	1.015	PB-214	lD
419.48	209.90	374.	119.	0.060	84.70	0.982	NP-239	s
477.68	238.92	150.	793.	0.397	12.50	1.122	PB-212	D
483.72	241.94	172.	105.	0.053	60.24	1.124	PB-214	D
516.24	258.26	229.	66.	0.033	116.52	0.857	XE-138	l
540.68	270.48	169.	91.	0.045	73.83	1.600	AC-228	s
555.14	277.70	171.	71.	0.036	85.43	1.329	NP-239	
601.20	300.73	121.	60.	0.030	88.61	1.467	PB-212	s
655.10	327.66	178.	72.	0.036	98.71	0.899	AC-228	s
1590.56	795.17	67.	33.	0.017	116.79	0.861	AC-228	s
2244.49	1121.97	22.	52.	0.026	57.16	1.714	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
HG-203	146.42	73.43	1213.	-153.	-0.076	99.84	1.499s
PB-212	149.16	74.79	1193.	205.	0.102	72.71	1.499s
PB-212	153.79	77.11	1018.	322.	0.161	45.22	1.499D
PB-214	153.79	77.11	1022.	318.	0.159	45.22	1.499D
TH-234	186.02	93.22	983.	121.	0.060	107.61	1.499s
RA-226	371.29	185.82	424.	166.	0.083	63.49	1.268s
PB-212	477.64	238.97	450.	608.	0.304	18.94	1.499
PB-214	591.00	295.63	209.	214.	0.107	34.91	1.499s
AC-228	677.25	338.73	154.	138.	0.069	48.66	1.175
PB-214	704.50	352.35	129.	342.	0.171	21.34	1.499
SB-125	927.16	463.63	81.	51.	0.026	82.78	1.499s
TL-208	1022.03	511.04	104.	85.	0.042	55.50	1.808s
TL-208	1167.38	583.68	97.	290.	0.145	25.99	1.418
BI-214	1219.88	609.92	71.	274.	0.137	24.65	1.125
BI-212	1455.75	727.80	43.	34.	0.017	94.09	1.499s
CS-134	1591.26	795.52	37.	27.	0.014	108.25	1.502s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
AC-228	1824.98	912.32	55.	150.	0.075	35.90	1.590
AC-228	1938.47	969.03	62.	121.	0.061	47.70	1.636s
BI-214	2241.15	1120.28	42.	44.	0.022	75.70	1.713D
K-40	2925.08	1462.03	6.	575.	0.288	12.64	1.975s
BI-214	3533.35	1765.96	0.	37.	0.018	49.32	1.443s

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		-7.6820E-02					
			477.56	-7.682E-02	%(	4.647E-01 1.36E-01	G
K-40		1.4078E+01					
			1460.75	1.408E+01	@(P	3.381E-01 5.96E-01	G
MN-54		-9.9823E-03					
			834.81	-9.982E-03	%(P	5.572E-02 1.60E-02	G
CO-57		-1.0271E-02					
			122.07	-1.027E-02	%(	5.823E-02 1.74E-02	G K
			136.43	8.926E-03	%	4.281E-01 1.27E-01	G
CO-60		3.8612E-03					
			1332.51	3.861E-03	&(P	5.918E-02 1.62E-02	G K
			1173.23	-2.489E-04	& P	7.590E-02 2.12E-02	G K
Sr-85		-2.6719E-02					
			514.00	-2.672E-02	%(	6.630E-02 2.00E-02	G
Kr-85		-6.3040E+02					
			513.99	-6.304E+02	%(P	1.500E+03 4.50E+02	G
Y-88		5.0785E-05					
			1836.01	5.078E-05	&(	5.809E-02 1.49E-02	G K
			898.02	2.897E-03	& P	5.624E-02 1.57E-02	G
NB-94		-7.3710E-03					
			871.10	-7.371E-03	%(P	4.942E-02 1.40E-02	G K
			702.50	1.367E-02	% P	4.943E-02 1.45E-02	G K

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
Ag-108M	-1.6561E-03						
		722.95	-1.656E-03	&(	7.796E-02	2.24E-02	G K
		614.37	-2.419E-02	% P	5.821E-02	1.75E-02	G
		433.93	1.614E-03	&	4.088E-02	1.17E-02	G
CD-109	1.0741E-01						
		88.04	1.074E-01	%(P	1.756E+00	5.25E-01	G
SN-113	1.4577E-02						
		391.71	1.458E-02	%(	5.029E-02	1.49E-02	G K
		255.04	1.407E-01	& P	1.791E+00	5.26E-01	G
SB-125	1.4134E-01						
		427.95	2.837E-02	%(P	1.290E-01	3.78E-02	G K
		600.77	-4.218E-02	% P	2.551E-01	7.38E-02	G
		636.15	-7.813E-02	& P	4.556E-01	1.32E-01	G
		463.51	4.758E-01	@(P	4.141E-01	1.35E-01	G
		176.29	9.807E-02	% P	7.171E-01	2.14E-01	G
I-131	-2.1837E-02						
		364.48	-2.184E-02	%(	6.794E-02	2.03E-02	G K
		636.97	2.032E-01	%	7.569E-01	2.22E-01	G
		284.29	7.699E-02	&	8.026E-01	2.36E-01	G
CS-134	2.7387E-02						
		604.66	8.136E-03	%(P	4.312E-02	1.24E-02	G K
		795.76	4.939E-02	(P	5.590E-02	1.81E-02	G
		569.29	7.843E-02	& P	3.010E-01	8.85E-02	G
		801.84	9.797E-02	%	4.886E-01	1.40E-01	G
CS-137	-3.8337E-03						
		661.62	-3.834E-03	%(P	5.284E-02	1.48E-02	G
CE-139	-1.6170E-04						
		165.85	-1.617E-04	&(P	5.890E-02	1.75E-02	G
EU-152	2.3292E-03						
		121.78	2.329E-03	&(P	1.556E-01	4.62E-02	G K
		344.30	-2.079E-02	& P	1.703E-01	4.99E-02	G
		1408.08	-2.125E-03	& P	3.047E-01	8.23E-02	G
		964.00	-1.467E-02	& P	4.695E-01	1.32E-01	G
		1112.07	-2.346E-03	% P	4.401E-01	1.21E-01	G
		778.90	-4.667E-02	% P	4.044E-01	1.15E-01	G
EU-154	-1.9545E-02						
		123.10	-1.954E-02	&(P	1.185E-01	3.54E-02	G K
		1274.80	6.612E-02	& P	1.154E-01	3.62E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
		723.30	-6.908E-02	& P	3.063E-01	8.95E-02	G
		1004.80	6.485E-02	& P	2.774E-01	7.98E-02	G
EU-155	1.0503E-02						
		86.45	1.050E-02	&(	2.034E-01	6.08E-02	G K
		105.31	4.613E-02	%	2.334E-01	7.00E-02	G
HG-203	-3.2126E-03						
		279.17	-3.213E-03	&(	5.485E-02	1.61E-02	G K
		72.87	-3.552E-01	% P	1.408E+00	4.24E-01	G
		70.83	-2.282E+00	+	2.468E+00	7.60E-01	G
		82.50	-7.356E-01	%	2.714E+00	8.17E-01	G
TL-208	3.8750E-01						
		583.14	3.888E-01	(P	6.510E-02	3.40E-02	G
		510.72	3.824E-01	*(P	2.268E-01	8.42E-02	G
PB-212	7.3416E-01						
		238.63	6.975E-01	(P	1.166E-01	4.45E-02	G K
							Energy duplication
		77.11	8.245E-01	(	3.874E-01	1.24E-01	G
		74.81	9.926E-01	+ P	7.943E-01	2.47E-01	G
PB-214	6.5511E-01						
		351.99	6.505E-01	(P	1.059E-01	4.65E-02	G K
		295.22	6.641E-01	@(P	2.175E-01	7.79E-02	G
							Energy duplication
		77.11	1.333E+00	+ P	6.348E-01	2.03E-01	G
		241.92	-2.951E-02	% P	8.738E-01	2.60E-01	G
BI-212	4.0909E-01						
		727.17	4.091E-01	@(P	3.982E-01	1.31E-01	G K
		1620.56	5.479E-01	%	1.537E+00	4.50E-01	G
		785.42	5.417E-01	% P	2.407E+00	6.97E-01	G
BI-214	6.9444E-01						
		609.32	7.150E-01	(P	1.092E-01	5.90E-02	G K
		1764.51	7.131E-01	(P	1.437E-01	1.19E-01	G
		1120.28	6.117E-01	(P	4.524E-01	1.56E-01	G
RA-224	5.5428E-01						
		241.00	5.543E-01	&(P	1.410E+00	4.26E-01	G
RA-226	2.0920E+00						
		185.99	2.092E+00	*(	1.248E+00	4.43E-01	G
AC-228	8.6411E-01						
		911.07	8.982E-01	(P	2.221E-01	1.09E-01	G K
		968.90	1.273E+00	+ P	4.113E-01	2.04E-01	G
		338.40	7.818E-01	(P	3.418E-01	1.29E-01	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments

TH-227      -2.7319E-01
                          236.00-2.732E-01 &(P 5.380E-01 1.63E-01 G K
                          256.25 1.106E-01 & P 6.531E-01 1.94E-01 G

PA-234       5.6550E-02
                           98.44 5.655E-02 &(  2.009E-01 6.04E-02 G K
                          946.00-6.344E-02 %   3.124E-01 9.06E-02 G
                          131.28-3.624E-02 %   2.413E-01 7.22E-02 G
                           94.67 1.845E-02 %   3.636E-01 1.09E-01 G
                          883.24 2.579E-02 &   3.683E-01 1.02E-01 G
                          926.70 1.187E-01 &   4.719E-01 1.37E-01 G
                          569.26 1.209E-01 &   4.443E-01 1.31E-01 G

TH-234       1.1723E+00
                           63.29 8.726E-01 %(P 2.563E+00 7.72E-01 G K
                           92.80 1.562E+00 &(P 1.921E+00 5.89E-01 G
                           92.38-1.318E-01 & P 2.297E+00 6.82E-01 G

AM-241       9.3789E-03
                           59.54 9.379E-03 %(P 2.940E-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	-7.4653E-02	-7.6820E-02	4.0779E-01	4.0782E-01	4.516E-01
K-40	#	1.4078E+01	1.4078E+01	1.7870E+00	1.9561E+00	
MN-54	#A	-9.9336E-03	-9.9823E-03	5.4913E-02	5.4916E-02	5.545E-02
CO-57	#B	-1.0213E-02	-1.0271E-02	5.2335E-02	5.2338E-02	5.790E-02
CO-60	#B	3.8581E-03	3.8612E-03	4.8738E-02	4.8739E-02	5.913E-02
Sr-85	#A	-2.6096E-02	-2.6719E-02	5.9912E-02	5.9931E-02	6.475E-02
Kr-85	#A	-6.3039E+02	-6.3040E+02	1.4762E+03	1.4766E+03	1.500E+03
Y-88	#B	5.0062E-05	5.0785E-05	4.4786E-02	4.4786E-02	5.726E-02
NB-94	#B	-7.3710E-03	-7.3710E-03	4.4707E-02	4.4709E-02	4.942E-02
Ag-108M	#B	-1.6561E-03	-1.6561E-03	6.7308E-02	6.7308E-02	7.795E-02
CD-109	#A	1.0705E-01	1.0741E-01	1.5756E+00	1.5757E+00	1.750E+00
SN-113	#B	1.4385E-02	1.4577E-02	4.4595E-02	4.4602E-02	4.963E-02
SB-125	#F	1.4113E-01	1.4134E-01	1.2029E-01	1.2056E-01	1.288E-01
I-131	#B	-1.8058E-02	-2.1837E-02	6.0956E-02	6.0969E-02	5.619E-02
CS-134	#B	2.7331E-02	2.7387E-02	3.0097E-02	3.0136E-02	4.303E-02
CS-137	#A	-3.8332E-03	-3.8337E-03	9.2749E-02	9.2749E-02	5.283E-02
CE-139	#A	-1.5991E-04	-1.6170E-04	3.4299E-02	3.4299E-02	5.825E-02
EU-152	#B	2.3285E-03	2.3292E-03	1.3867E-01	1.3867E-01	1.556E-01
EU-154	#B	-1.9535E-02	-1.9545E-02	1.1562E-01	1.1562E-01	1.184E-01
EU-155	#B	1.0494E-02	1.0503E-02	1.8249E-01	1.8249E-01	2.033E-01
HG-203	#B	-3.1090E-03	-3.2126E-03	4.8379E-02	4.8379E-02	5.308E-02
TL-208		3.8750E-01	3.8750E-01	1.0154E-01	1.0387E-01	
PB-212	#	7.3416E-01	7.3416E-01	1.4043E-01	1.4643E-01	1.166E-01
PB-214	#	6.5511E-01	6.5511E-01	1.3503E-01	1.4001E-01	1.059E-01
BI-212	#	4.0909E-01	4.0909E-01	3.9258E-01	3.9326E-01	3.982E-01
BI-214		6.9444E-01	6.9444E-01	1.7187E-01	1.7629E-01	
RA-224	#A	5.5428E-01	5.5428E-01	1.2769E+00	1.2773E+00	1.410E+00
RA-226	#	2.0920E+00	2.0920E+00	1.3282E+00	1.3334E+00	
AC-228		8.6411E-01	8.6411E-01	2.6506E-01	2.6952E-01	
TH-227	#B	-2.7319E-01	-2.7319E-01	4.9679E-01	4.9703E-01	5.380E-01
PA-234	#B	5.6550E-02	5.6550E-02	1.8128E-01	1.8130E-01	2.009E-01
TH-234	#B	1.1723E+00	1.1723E+00	1.3260E+00	1.3276E+00	2.563E+00
AM-241	#A	9.3788E-03	9.3789E-03	2.6189E-01	2.6189E-01	2.940E-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 1999.1 keV) 1.8116415E+01 pCi/gm
Total Decayed Activity (1460.5 to 1999.1 keV) 1.8116421E+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_9AUG2006_1640.An1

Sample description
FSS-OOL-10-02-007-F

Spectrum Filename: C:\GammaVision\Spectra\101F_9AUG2006_1640.An1

Acquisition information

Start time:	09-Aug-2006 16:40:40
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:	1.8990E+03
Activity scaling factor:	1.0000E+06/(1.0000E+00* 1.8990E+03) = 5.2659E+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	04-Aug-2006 10:55:00
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: 0.4840

***** 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
74.40	102.	30.03	1.00	1.651E-02	72.87	6.400	PBC<MDA	HG203
					74.81	9.600	PBC<MDA	PB212
77.55	209.	14.07	1.01	1.740E-02	77.11	10.700	7.953E-01	PB214
					77.11	17.500	4.950E-01	PB212
93.05	101.	37.62	1.50	1.989E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
186.34	124.	24.49	1.33	1.856E-02	185.99	3.280	1.443E+00	RA226
238.99	626.	4.71	1.12	1.556E-02	238.63	43.100	6.572E-01	PB212
242.06	84.	24.16	1.12	1.539E-02	241.00	3.900	PBC<MDA	RA224
					241.92	7.470	5.142E-01	PB214
295.44	174.	13.68	1.09	1.291E-02	295.22	19.200	4.926E-01	PB214
328.52	51.	40.83	0.88	1.168E-02				
338.75	122.	20.90	1.24	1.134E-02	338.40	12.010	6.250E-01	AC228
					344.30	27.000	2.863E-01	EU152
352.36	204.	9.55	1.19	1.091E-02	351.99	37.100	3.552E-01	PB214
463.24	34.	38.70	0.67	8.346E-03				
463.24	34.	38.70	0.67	8.346E-03	463.51	10.000	PBC<MDA	SB125
478.27	38.	30.49	1.60	8.090E-03	477.56	10.300	3.450E-01	BE7
511.56	80.	19.70	1.65	7.578E-03	510.72	22.500	2.649E-01	TL208
					513.99	0.004	1.720E+03	Kr85
					514.00	99.270	8.000E-02	Sr85
583.83	192.	9.83	1.38	6.677E-03	583.14	86.000	2.341E-01	TL208
609.92	143.	11.63	1.44	6.407E-03	609.32	46.090	3.411E-01	BI214
727.77	43.	27.00	0.72	5.439E-03	727.17	11.800	4.689E-01	BI212
862.98	50.	23.64	1.23	4.665E-03				
911.79	114.	12.72	1.84	4.443E-03	911.07	29.000	6.216E-01	AC228
969.46	108.	17.32	1.75	4.210E-03	968.90	17.460	1.037E+00	AC228

1120.78	55.	28.57	2.05	3.711E-03	1120.28	15.040	6.964E-01	BI214
1174.53	40.	27.42	1.75	3.565E-03	1173.23	99.860	7.925E-02	CO60

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
1333.47	82.	14.47	1.14	3.188E-03	1332.51	99.980	1.840E-01	CO60
1462.12	563.	4.40	2.10	2.940E-03	1460.75	10.700	1.268E+01	K40
1766.03	25.	20.00	0.80	2.481E-03	1764.51	15.920	4.425E-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	
149.27	74.72	358.	163.	0.081	54.68	1.005	BI-207	D
477.69	238.97	123.	626.	0.313	14.14	1.122	PB-212	D
656.81	328.52	141.	51.	0.025	122.48	0.879	RH-106M	
926.38	463.24	58.	34.	0.017	116.09	0.670	AC-228	l
956.45	478.27	44.	37.	0.018	91.40	1.598	BE-7	s
1726.26	862.98	29.	50.	0.025	61.74	1.230	-	s
2667.79	1333.47	62.	34.	0.017	111.39	1.143	CO-60	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	75.04	892.	130.	0.065	97.07	1.499s
PB-214	153.79	77.11	366.	245.	0.123	37.62	1.007D
PB-212	153.79	77.11	802.	224.	0.112	57.23	1.499D
TH-234	185.68	93.05	762.	101.	0.050	112.87	1.499
RA-226	372.14	186.24	423.	109.	0.055	84.78	1.499s
PB-212	477.72	239.01	416.	465.	0.232	22.89	1.499
PB-214	483.54	241.92	146.	85.	0.042	67.98	1.124D
PB-214	590.62	295.44	146.	172.	0.086	41.05	1.093s
AC-228	677.29	338.75	172.	120.	0.060	62.71	1.240
PB-214	704.52	352.36	79.	202.	0.101	28.65	1.186
TL-208	1023.07	511.56	75.	64.	0.032	59.10	1.647s
Kr-85	1023.09	511.57	47.	61.	0.030	59.85	1.499s
Sr-85	1023.09	511.57	45.	62.	0.031	59.85	1.499s
TL-208	1167.68	583.83	55.	189.	0.095	29.49	1.375s
BI-214	1219.88	609.92	52.	142.	0.071	34.90	1.443
BI-212	1455.69	727.77	35.	42.	0.021	81.00	0.723s
AC-228	1823.92	911.79	33.	113.	0.056	38.16	1.844s
AC-228	1939.33	969.46	57.	107.	0.054	51.95	1.753
BI-214	2242.14	1120.78	48.	55.	0.027	85.72	2.049s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
CO-60	2349.71	1174.53	40.	40.	0.020	82.27	1.746s
CO-60	2667.91	1333.53	26.	48.	0.024	61.69	1.846s
K-40	2925.25	1462.12	13.	561.	0.280	13.19	2.101
BI-214	3533.50	1766.03	0.	25.	0.012	60.00	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	Peak MDA Value pCi/gm	COMMENTS
BE-7		9.7160E-03					
			477.56	9.716E-03	%(	4.631E-01 1.33E-01 G	
K-40		1.2678E+01					
			1460.75	1.268E+01	(P	4.422E-01 5.60E-01 G	
MN-54		3.0174E-03					
			834.81	3.017E-03	&(P	4.751E-02 1.33E-02 G	
CO-57		-1.8735E-03					
			122.07	-1.873E-03	%(	4.213E-02 1.25E-02 G K	
			136.43	-6.916E-03	%	4.045E-01 1.20E-01 G	
CO-60		9.3779E-02					
			1332.51	1.083E-01	(P	5.879E-02 2.23E-02 G K	
			1173.23	7.925E-02	*(P	6.417E-02 2.18E-02 G K	
Sr-85		6.2260E-02					
			514.00	6.226E-02	&(	3.428E-02 1.24E-02 G	
Kr-85		1.3332E+03					
			513.99	1.333E+03	&(P	7.572E+02 2.71E+02 G	
Y-88		8.0079E-03					
			1836.01	8.008E-03	&(	3.957E-02 1.07E-02 G K	
			898.02	-1.471E-02	% P	6.395E-02 1.86E-02 G	
NB-94		-2.2043E-04					
			871.10	-2.204E-04	%(P	4.262E-02 1.16E-02 G K	
			702.50	2.561E-02	% P	4.337E-02 1.34E-02 G K	
Ag-108M		-1.2211E-02					
			722.95	-1.221E-02	%(	5.039E-02 1.47E-02 G K	
			614.37	-8.774E-03	% P	5.485E-02 1.60E-02 G	

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
		433.93	1.199E-02	%	3.301E-02	9.84E-03	G
CD-109	-8.8001E-02						
		88.04	-8.800E-02	%(P	1.429E+00	4.26E-01	G
SN-113	-9.6727E-03						
		391.71	-9.673E-03	%(	5.991E-02	1.75E-02	G K
		255.04	4.813E-01	& P	1.772E+00	5.29E-01	G
SB-125	-1.1355E-02						
		427.95	-1.136E-02	&(P	1.296E-01	3.74E-02	G K
		600.77	9.665E-03	% P	2.343E-01	6.66E-02	G
		636.15	-2.915E-02	% P	3.741E-01	1.06E-01	G
		463.51	2.413E-01	% P	3.600E-01	1.11E-01	G
		176.29	-9.573E-02	% P	5.852E-01	1.74E-01	G
I-131	1.6043E-02						
		364.48	1.604E-02	%(	5.756E-02	1.70E-02	G K
		636.97	8.616E-03	%	7.388E-01	2.04E-01	G
		284.29	1.572E-01	&	9.620E-01	2.84E-01	G
CS-134	2.6749E-03						
		604.66	2.675E-03	%(P	4.277E-02	1.21E-02	G K
		795.76	3.568E-02	% P	5.835E-02	1.80E-02	G
		569.29	6.949E-02	% P	2.615E-01	7.68E-02	G
		801.84	6.801E-03	&	4.113E-01	1.12E-01	G
CS-137	2.4763E-02						
		661.62	2.476E-02	%(P	5.292E-02	1.60E-02	G
CE-139	-5.4266E-03						
		165.85	-5.427E-03	%(P	4.827E-02	1.43E-02	G
EU-152	1.5439E-02						
		121.78	1.544E-02	%(P	1.343E-01	4.00E-02	G K
		344.30	-9.474E-03	% P	1.064E-01	3.05E-02	G
		1408.08	1.116E-02	% P	2.192E-01	5.83E-02	G
		964.00	-5.694E-02	& P	3.573E-01	1.01E-01	G
		1112.07	-5.717E-02	% P	4.330E-01	1.23E-01	G
		778.90	-2.013E-02	% P	3.429E-01	9.62E-02	G
EU-154	-2.4662E-02						
		123.10	-2.466E-02	%(P	9.926E-02	2.98E-02	G K
		1274.80	-2.349E-02	& P	1.699E-01	4.81E-02	G
		723.30	-6.118E-02	% P	2.346E-01	6.84E-02	G
		1004.80	3.315E-02	& P	2.750E-01	7.74E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
EU-155	-7.7839E-03						
		86.45	-7.784E-03	%(	1.260E-01	3.74E-02	G K
		105.31	4.899E-02	%	1.912E-01	5.74E-02	G
HG-203	-1.4986E-02						
		279.17	-1.499E-02	%(	5.126E-02	1.53E-02	G K
		72.87	-2.979E-01	% P	1.170E+00	3.51E-01	G
		70.83	2.242E-01	%	1.293E+00	3.85E-01	G
		82.50	-2.684E-01	%	2.548E+00	7.61E-01	G
TL-208	2.4050E-01						
		583.14	2.341E-01	@(P	4.609E-02	2.33E-02	G
		510.72	2.649E-01	(P	1.799E-01	6.54E-02	G
PB-212	5.1395E-01						
		238.63	4.924E-01	(P	1.036E-01	3.81E-02	G K
							Energy duplication
		77.11	5.298E-01	(	3.184E-01	1.01E-01	G
		74.81	5.815E-01	&(P	6.359E-01	1.96E-01	G
PB-214	3.5522E-01						
		351.99	3.552E-01	(P	7.733E-02	3.43E-02	G K
		295.22	4.926E-01	+ P	1.695E-01	6.82E-02	G
							Energy duplication
		77.11	9.473E-01	+ P	3.551E-01	1.21E-01	G
		241.92	5.253E-01	+ P	3.651E-01	1.20E-01	G
BI-212	4.6892E-01						
		727.17	4.689E-01	(P	3.341E-01	1.29E-01	G K
		1620.56	-2.224E-01	%	1.519E+00	4.09E-01	G
		785.42	-2.318E-02	% P	2.497E+00	6.99E-01	G
BI-214	3.6716E-01						
		609.32	3.411E-01	(P	8.767E-02	4.00E-02	G K
		1764.51	4.425E-01	(P	1.328E-01	9.01E-02	G
		1120.28	6.964E-01	+ P	4.478E-01	2.01E-01	G
RA-224	6.9690E-01						
		241.00	6.969E-01	&(P	1.202E+00	3.66E-01	G
RA-226	1.2770E+00						
		185.99	1.277E+00	*(	1.151E+00	3.61E-01	G
AC-228	6.2257E-01						
		911.07	6.216E-01	@(P	1.635E-01	8.04E-02	G K
		968.90	1.037E+00	+ P	3.661E-01	1.81E-01	G
		338.40	6.250E-01	(P	3.335E-01	1.33E-01	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments

TH-227      -1.7611E-02
                          236.00-1.761E-02 %(P 4.390E-01 1.30E-01 G K
                          256.25 1.358E-01 & P 5.009E-01 1.49E-01 G

PA-234      -2.6904E-02
                           98.44-2.690E-02 &(  1.720E-01 5.14E-02 G K
                          946.00 4.740E-02 %   2.568E-01 7.38E-02 G
                          131.28-1.932E-03 &   1.861E-01 5.51E-02 G
                           94.67-2.200E-02 %   3.044E-01 9.08E-02 G
                          883.24-2.433E-02 %   3.590E-01 9.99E-02 G
                          926.70-3.780E-02 &   4.841E-01 1.37E-01 G
                          569.26 1.070E-01 %   3.848E-01 1.13E-01 G

TH-234       7.6743E-01
                           63.29 4.337E-01 %(P 2.062E+00 6.16E-01 G K
                           92.80 1.201E+00  (P 1.566E+00 4.80E-01 G
                           92.38-1.811E-01 % P 1.941E+00 5.74E-01 G

AM-241       1.3997E-02
                           59.54 1.400E-02 %(P 2.698E-01 8.02E-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	9.0771E-03	9.7160E-03	4.0013E-01	4.0013E-01	4.327E-01
K-40		1.2678E+01	1.2678E+01	1.6786E+00	1.8251E+00	
MN-54	#A	2.9825E-03	3.0174E-03	3.9960E-02	3.9960E-02	4.696E-02
CO-57	#B	-1.8484E-03	-1.8735E-03	3.7460E-02	3.7460E-02	4.156E-02
CO-60	#	9.3602E-02	9.3779E-02	4.8364E-02	4.8654E-02	5.868E-02
Sr-85	#	5.8868E-02	6.2260E-02	3.7263E-02	3.7429E-02	3.241E-02
Kr-85	#	1.3332E+03	1.3332E+03	8.1341E+02	8.1689E+02	7.571E+02
Y-88	#B	7.7396E-03	8.0079E-03	3.2073E-02	3.2076E-02	3.824E-02
NB-94	#B	-2.2043E-04	-2.2043E-04	9.6812E-01	9.6812E-01	4.262E-02
Ag-108M	#B	-1.2210E-02	-1.2211E-02	4.4160E-02	4.4165E-02	5.039E-02
CD-109	#A	-8.7299E-02	-8.8001E-02	1.4202E+00	1.4202E+00	1.418E+00
SN-113	#B	-9.3722E-03	-9.6727E-03	5.2645E-02	5.2648E-02	5.805E-02
SB-125	#B	-1.1314E-02	-1.1355E-02	1.3102E-01	1.3102E-01	1.291E-01
I-131	#B	1.0211E-02	1.6043E-02	5.1067E-02	5.1075E-02	3.664E-02
CS-134	#B	2.6620E-03	2.6749E-03	3.6418E-02	3.6418E-02	4.256E-02
CS-137	#A	2.4755E-02	2.4763E-02	4.7919E-02	4.7939E-02	5.290E-02
CE-139	#A	-5.2851E-03	-5.4266E-03	4.5523E-02	4.5524E-02	4.701E-02
EU-152	#B	1.5427E-02	1.5439E-02	1.2006E-01	1.2006E-01	1.342E-01
EU-154	#B	-2.4634E-02	-2.4662E-02	9.4934E-02	9.4944E-02	9.914E-02
EU-155	#B	-7.7683E-03	-7.7839E-03	1.1227E-01	1.1227E-01	1.258E-01
HG-203	#B	-1.3862E-02	-1.4986E-02	4.5983E-02	4.5991E-02	4.741E-02
TL-208		2.4050E-01	2.4050E-01	7.1802E-02	7.3076E-02	
PB-212	#	5.1395E-01	5.1395E-01	1.1922E-01	1.2271E-01	1.036E-01
PB-214		3.5522E-01	3.5522E-01	1.0277E-01	1.0472E-01	
BI-212		4.6892E-01	4.6892E-01	3.8592E-01	3.8683E-01	
BI-214		3.6716E-01	3.6716E-01	1.2913E-01	1.3078E-01	
RA-224	#A	6.9690E-01	6.9690E-01	1.0986E+00	1.0993E+00	1.202E+00
RA-226	#	1.2770E+00	1.2770E+00	1.0826E+00	1.0850E+00	1.151E+00
AC-228		6.2257E-01	6.2257E-01	2.3257E-01	2.3522E-01	
TH-227	#B	-1.7611E-02	-1.7611E-02	4.7711E-01	4.7711E-01	4.390E-01
PA-234	#B	-2.6904E-02	-2.6904E-02	1.5426E-01	1.5427E-01	1.720E-01
TH-234	#B	7.6743E-01	7.6743E-01	9.1930E-01	9.2028E-01	2.062E+00
AM-241	#A	1.3996E-02	1.3997E-02	2.4053E-01	2.4053E-01	2.698E-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) 1.4732334E+01 pCi/gm
Total Decayed Activity (295.1 to 1999.1 keV) 1.4732334E+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_9AUG2006_1717.An1

Sample description
FSS-OOL-10-02-010-F

Spectrum Filename: C:\GammaVision\Spectra\101F_9AUG2006_1717.An1

Acquisition information

Start time:	09-Aug-2006 17:17:14
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:	1.8970E+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	07-Aug-2006 13:05:00
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. 17 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.5450

***** 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
74.36	188.	20.19	1.00	1.651E-02				
74.36	188.	20.19	1.00	1.651E-02	74.81	9.600	8.181E-01	PB212
77.39	370.	9.31	1.01	1.737E-02	77.11	17.500	8.753E-01	PB212
					77.11	10.700	1.417E+00	PB214
86.84	130.	24.67	1.01	1.915E-02	86.45	32.740	1.478E-01	EU155
89.77	131.	25.39	1.02	1.954E-02	88.04	3.790	PBC<MDA	CD109
93.47	177.	18.09	1.02	1.996E-02	92.80	3.000	2.035E+00	TH234
186.58	182.	19.25	0.99	1.855E-02	185.99	3.280	2.129E+00	RA226
209.96	122.	28.72	0.95	1.718E-02				
238.98	889.	3.89	1.12	1.556E-02	238.63	43.100	9.365E-01	PB212
241.91	143.	15.80	1.12	1.540E-02	241.00	3.900	1.686E+00	RA224
					241.92	7.470	8.833E-01	PB214
270.26	124.	21.13	1.89	1.400E-02				
295.43	260.	11.59	0.98	1.291E-02	295.22	19.200	7.404E-01	PB214
338.35	201.	14.39	1.01	1.135E-02	338.40	12.010	1.039E+00	AC228
352.42	394.	8.83	1.28	1.091E-02	351.99	37.100	6.881E-01	PB214
463.76	72.	25.72	1.22	8.337E-03	463.51	10.000	6.026E-01	SB125
511.25	103.	19.13	1.66	7.583E-03	510.72	22.500	3.636E-01	TL208
583.83	241.	8.26	1.34	6.677E-03	583.14	86.000	2.952E-01	TL208
609.99	257.	8.91	1.19	6.406E-03	609.32	46.090	6.165E-01	BI214
719.79	29.	24.18	1.50	5.470E-03	723.30	19.700	1.932E-01	EU154
728.05	58.	22.92	1.51	5.437E-03	727.17	11.800	6.302E-01	BI212
795.38	61.	22.67	1.61	5.018E-03				
795.38	61.	22.67	1.61	5.018E-03	795.76	85.400	1.009E-01	CS134
912.20	165.	10.34	2.03	4.442E-03	911.07	29.000	9.029E-01	AC228
969.28	133.	12.38	1.69	4.211E-03	968.90	17.460	1.283E+00	AC228
1121.09	92.	18.98	1.13	3.709E-03	1120.28	15.040	1.169E+00	BI214

1462.12	573.	4.39	1.93	2.940E-03	1460.75	10.700	1.292E+01	K40
1590.41	44.	23.51	0.91	2.728E-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	
173.26	86.80	446.	130.	0.065	74.01	1.013	BI-207	lD
179.12	89.72	488.	131.	0.066	76.16	1.016	PB-214	lD
419.60	209.96	422.	122.	0.061	86.17	0.950	NP-239	s
477.66	238.92	153.	889.	0.444	11.67	1.122	PB-212	D
483.53	241.85	185.	143.	0.072	47.39	1.124	PB-214	D
540.24	270.26	225.	124.	0.062	63.39	1.889	AC-228	s
3182.02	1590.41	14.	44.	0.022	70.53	0.908	-	s
3534.00	1766.28	0.	50.	0.025	42.43	1.582	BI-214	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	149.44	74.94	1270.	258.	0.129	60.19	1.499
PB-212	153.79	77.11	1186.	313.	0.156	49.70	1.499D
PB-214	153.79	77.11	1189.	309.	0.155	49.70	1.499D
TH-234	185.82	93.12	1031.	209.	0.104	66.42	1.499s
RA-226	372.81	186.58	437.	182.	0.091	57.76	0.994s
PB-212	477.68	238.99	531.	699.	0.350	17.82	1.499
RA-224	483.71	242.01	580.	111.	0.055	95.86	1.499
PB-214	590.95	295.60	227.	238.	0.119	32.83	1.499s
AC-228	676.49	338.35	214.	199.	0.099	43.18	1.007s
PB-214	704.52	352.36	141.	370.	0.185	20.59	1.499
SB-125	927.21	463.66	101.	53.	0.026	87.89	1.499
TL-208	1022.44	511.25	115.	87.	0.044	57.39	1.662s
TL-208	1167.68	583.83	67.	238.	0.119	24.79	1.338
BI-214	1220.01	609.99	87.	256.	0.128	26.73	1.191
EU-154	1439.72	719.79	11.	29.	0.015	72.54	1.499s
BI-212	1456.28	728.06	64.	58.	0.029	81.09	1.510
CS-134	1592.05	795.91	40.	41.	0.020	79.52	1.502s
AC-228	1824.76	912.20	46.	163.	0.082	31.01	2.027s
AC-228	1938.97	969.28	42.	132.	0.066	37.14	1.694s
BI-214	2242.76	1121.09	56.	92.	0.046	56.93	1.128s
K-40	2925.27	1462.12	16.	571.	0.286	13.17	1.929

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		-8.3807E-02					
			477.56	-8.381E-02	%(	4.356E-01 1.28E-01	G
K-40		1.2922E+01					
			1460.75	1.292E+01	(P	4.815E-01 5.70E-01	G
MN-54		1.8214E-03					
			834.81	1.821E-03	%(P	4.249E-02 1.17E-02	G
CO-57		-4.8090E-04					
			122.07	-4.809E-04	%(	5.298E-02 1.58E-02	G K
			136.43	6.283E-02	%	4.288E-01 1.28E-01	G
CO-60		-7.4778E-04					
			1332.51	-7.478E-04	%(P	5.436E-02 1.47E-02	G K
			1173.23	-1.913E-02	& P	8.321E-02 2.44E-02	G K
Sr-85		-8.1053E-03					
			514.00	-8.105E-03	%(	5.326E-02 1.56E-02	G
Kr-85		-2.0864E+02					
			513.99	-2.086E+02	%(P	1.207E+03 3.52E+02	G
Y-88		6.3576E-04					
			1836.01	6.358E-04	%(	4.834E-02 1.22E-02	G K
			898.02	-2.740E-03	% P	5.313E-02 1.48E-02	G
NB-94		-1.9019E-03					
			871.10	-1.902E-03	&(P	5.702E-02 1.61E-02	G K
			702.50	2.643E-03	& P	6.015E-02 1.73E-02	G K
Ag-108M		-5.8824E-03					
			722.95	-5.882E-03	%(	5.326E-02 1.53E-02	G K
			614.37	-2.832E-02	% P	6.751E-02 2.03E-02	G
			433.93	9.502E-03	&	4.313E-02 1.27E-02	G
CD-109		3.5709E-01					
			88.04	3.571E-01	%(P	1.632E+00 4.91E-01	G
SN-113		-1.4771E-03					
			391.71	-1.477E-03	%(	6.002E-02 1.73E-02	G K
			255.04	3.890E-01	& P	1.924E+00 5.72E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	1.3877E-01						
		427.95	3.301E-02	%(P	1.315E-01	3.88E-02	G K
		600.77	8.403E-02	% P	2.458E-01	7.31E-02	G
		636.15	-7.480E-02	& P	4.278E-01	1.24E-01	G
		463.51	4.518E-01	(P	4.231E-01	1.36E-01	G
		176.29	-1.309E-02	% P	7.177E-01	2.13E-01	G
I-131	1.7374E-02						
		364.48	1.737E-02	%(	5.567E-02	1.66E-02	G K
		636.97	2.046E-02	&	7.951E-01	2.26E-01	G
		284.29	5.129E-03	%	8.258E-01	2.42E-01	G
CS-134	2.9958E-02						
		604.66	-3.410E-03	&(P	5.309E-02	1.52E-02	G K
		795.76	6.809E-02	*(P	5.340E-02	1.82E-02	G
		569.29	7.258E-02	% P	2.828E-01	8.31E-02	G
		801.84	3.257E-03	&	5.260E-01	1.46E-01	G
CS-137	-1.0378E-03						
		661.62	-1.038E-03	%(P	4.593E-02	1.26E-02	G
CE-139	-5.4886E-03						
		165.85	-5.489E-03	&(P	5.716E-02	1.70E-02	G
EU-152	-1.9952E-02						
		121.78	-1.995E-02	%(P	1.579E-01	4.72E-02	G K
		344.30	5.447E-03	% P	1.497E-01	4.36E-02	G
		1408.08	-7.272E-02	& P	2.592E-01	7.47E-02	G
		964.00	1.984E-01	% P	4.033E-01	1.22E-01	G
		1112.07	-4.933E-02	% P	4.442E-01	1.26E-01	G
		778.90	2.621E-02	% P	3.870E-01	1.10E-01	G
EU-154	6.0235E-02						
		123.10	-4.514E-03	%(P	1.153E-01	3.43E-02	G K
		1274.80	-1.110E-03	& P	1.821E-01	5.03E-02	G
		723.30	1.932E-01	?(P	1.208E-01	4.73E-02	G
		1004.80	-4.548E-04	% P	2.936E-01	8.09E-02	G
EU-155	1.2965E-01						
		86.45	1.296E-01	%(	1.876E-01	5.73E-02	G K
		105.31	5.454E-02	%	2.191E-01	6.59E-02	G
HG-203	3.1245E-03						
		279.17	3.125E-03	&(	5.347E-02	1.57E-02	G K
		72.87	-4.557E-01	% P	1.364E+00	4.11E-01	G
		70.83	-9.516E-02	%	2.354E+00	7.04E-01	G
		82.50	-7.573E-01	%	2.951E+00	8.88E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	3.0939E-01						
		583.14	2.952E-01	(P	5.055E-02	2.47E-02	G
		510.72	3.636E-01	(P	2.196E-01	8.24E-02	G
PB-212	7.4141E-01						
		238.63	7.420E-01	(P	1.168E-01	4.45E-02	G K
							Energy duplication
		77.11	7.400E-01	(	3.861E-01	1.23E-01	G
		74.81	1.158E+00	& P	7.571E-01	2.37E-01	G
PB-214	6.6167E-01						
		351.99	6.498E-01	(P	1.022E-01	4.48E-02	G K
		295.22	6.847E-01	@(P	2.095E-01	7.55E-02	G
							Energy duplication
		77.11	1.196E+00	+ P	6.324E-01	2.00E-01	G
		241.92	2.833E-02	% P	8.479E-01	2.53E-01	G
BI-212	6.4687E-01						
		727.17	6.469E-01	(P	4.425E-01	1.77E-01	G K
		1620.56	-9.661E-02	&	1.993E+00	5.34E-01	G
		785.42	8.888E-02	% P	2.214E+00	6.18E-01	G
BI-214	6.1651E-01						
		609.32	6.165E-01	(P	1.114E-01	5.52E-02	G K
		1764.51	-7.894E-03	% P	1.329E-01	1.80E-02	G
		1120.28	1.169E+00	+ P	4.812E-01	2.23E-01	G
RA-224	1.3105E+00						
		241.00	1.310E+00	&(P	1.359E+00	4.21E-01	G
RA-226	2.1295E+00						
		185.99	2.129E+00	@(	1.170E+00	4.11E-01	G
AC-228	9.4274E-01						
		911.07	9.029E-01	*(P	1.887E-01	9.45E-02	G K
		968.90	1.283E+00	+ P	3.171E-01	1.60E-01	G
		338.40	1.039E+00	*(P	3.706E-01	1.51E-01	G
TH-227	-1.8518E-01						
		236.00	-1.852E-01	%(P	4.978E-01	1.50E-01	G K
		256.25	-1.423E-02	% P	5.354E-01	1.56E-01	G
PA-234	1.4774E-03						
		98.44	1.477E-03	&(	1.624E-01	4.82E-02	G K
		946.00	2.330E-02	&	2.534E-01	7.15E-02	G
		131.28	4.560E-02	&	2.325E-01	6.97E-02	G
		94.67	-1.558E-01	%	3.588E-01	1.09E-01	G
		883.24	2.549E-02	%	4.076E-01	1.14E-01	G
		926.70	-1.335E-03	%	4.714E-01	1.31E-01	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26 1.112E-01 %   4.177E-01 1.23E-01 G

TH-234       1.6375E+00
                           63.29 9.801E-01 %(P 2.425E+00 7.32E-01 G K
                           92.80 2.492E+00  (P 1.818E+00 5.68E-01 G
                           92.38-3.268E-02 & P 2.213E+00 6.58E-01 G

AM-241      -4.5918E-02
                           59.54-4.592E-02 %(P 3.016E-01 9.02E-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	-8.1474E-02	-8.3807E-02	3.8365E-01	3.8368E-01	4.235E-01
K-40		1.2922E+01	1.2922E+01	1.7081E+00	1.8576E+00	
MN-54	#A	1.8126E-03	1.8214E-03	3.5236E-02	3.5237E-02	4.228E-02
CO-57	#B	-4.7822E-04	-4.8090E-04	4.7277E-02	4.7277E-02	5.269E-02
CO-60	#B	-7.4719E-04	-7.4778E-04	7.4787E-02	7.4787E-02	5.431E-02

Sr-85	#A	-7.9190E-03	-8.1053E-03	4.6852E-02	4.6855E-02	5.204E-02
Kr-85	#A	-2.0864E+02	-2.0864E+02	1.3555E+03	1.3555E+03	1.207E+03
Y-88	#B	6.2684E-04	6.3576E-04	3.6744E-02	3.6744E-02	4.766E-02
NB-94	#B	-1.9019E-03	-1.9019E-03	5.9989E-02	5.9989E-02	5.702E-02
Ag-108M	#B	-5.8822E-03	-5.8824E-03	4.5779E-02	4.5781E-02	5.326E-02
CD-109	#A	3.5590E-01	3.5709E-01	1.4726E+00	1.4727E+00	1.627E+00
SN-113	#B	-1.4579E-03	-1.4771E-03	5.1969E-02	5.1969E-02	5.924E-02
SB-125	#F	1.3856E-01	1.3877E-01	1.2530E-01	1.2554E-01	1.313E-01
I-131	#B	1.4403E-02	1.7374E-02	4.9808E-02	4.9817E-02	4.615E-02
CS-134	#B	2.9898E-02	2.9958E-02	2.4065E-02	2.4124E-02	5.298E-02
CS-137	#A	-1.0377E-03	-1.0378E-03	4.0274E-01	4.0274E-01	4.592E-02
CE-139	#A	-5.4287E-03	-5.4886E-03	5.3979E-02	5.3980E-02	5.654E-02
EU-152	#B	-1.9946E-02	-1.9952E-02	1.5495E-01	1.5496E-01	1.578E-01
EU-154	#B	6.0205E-02	6.0235E-02	4.4238E-02	4.4364E-02	1.153E-01
EU-155	#B	1.2954E-01	1.2965E-01	1.7194E-01	1.7209E-01	1.875E-01
HG-203	#B	3.0250E-03	3.1245E-03	4.7244E-02	4.7244E-02	5.177E-02
TL-208		3.0939E-01	3.0939E-01	7.7451E-02	7.9399E-02	
PB-212	#	7.4141E-01	7.4141E-01	1.3327E-01	1.3970E-01	1.168E-01
PB-214	#	6.6167E-01	6.6167E-01	1.2908E-01	1.3438E-01	1.022E-01
BI-212		6.4687E-01	6.4687E-01	5.3062E-01	5.3187E-01	
BI-214		6.1651E-01	6.1651E-01	1.6549E-01	1.6911E-01	
RA-224	#A	1.3105E+00	1.3105E+00	1.2644E+00	1.2665E+00	1.359E+00
RA-226	#	2.1294E+00	2.1295E+00	1.2299E+00	1.2358E+00	
AC-228	#	9.4274E-01	9.4274E-01	2.5339E-01	2.5893E-01	
TH-227	#B	-1.8518E-01	-1.8518E-01	4.5925E-01	4.5937E-01	4.978E-01
PA-234	#B	1.4774E-03	1.4774E-03	1.4448E-01	1.4448E-01	1.624E-01
TH-234	#B	1.6375E+00	1.6375E+00	1.1198E+00	1.1234E+00	2.425E+00
AM-241	#A	-4.5918E-02	-4.5918E-02	2.9560E-01	2.9561E-01	3.016E-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) 1.7567081E+01 pCi/gm
Total Decayed Activity (270.1 to 1999.1 keV) 1.7567087E+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_9AUG2006_1756.An1

Sample description
FSS-OOL-10-02-018-F

Spectrum Filename: C:\GammaVision\Spectra\101F_9AUG2006_1756.An1

Acquisition information

Start time:	09-Aug-2006 17:56:20
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:	1.7420E+03
Activity scaling factor:	1.0000E+06/(1.0000E+00* 1.7420E+03) = 5.7405E+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	04-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. 14 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.6019

***** 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
74.35	106.	30.71	1.00	1.651E-02				
74.35	106.	30.71	1.00	1.651E-02	74.81	9.600	PBC<MDA	PB212
77.32	360.	8.82	1.01	1.735E-02	77.11	10.700	1.503E+00	PB214
					77.11	17.500	9.284E-01	PB212
93.06	142.	27.77	1.50	1.985E-02	88.04	3.790	PBC<MDA	CD109
					92.38	2.570	2.164E+00	TH234
					92.80	3.000	PBC<MDA	TH234
93.07	146.	27.53	1.50	1.989E-02	92.38	2.570	2.223E+00	TH234
					92.80	3.000	1.900E+00	TH234
185.99	158.	20.61	1.45	1.858E-02	185.99	3.280	2.005E+00	RA226
238.94	726.	4.42	1.12	1.556E-02	238.63	43.100	8.314E-01	PB212
					241.92	7.470	4.888E+00	PB214
242.03	89.	22.97	1.12	1.540E-02				
295.68	131.	13.15	1.16	1.291E-02	295.22	19.200	4.026E-01	PB214
300.41	42.	35.55	1.16	1.272E-02				
329.20	67.	33.06	0.93	1.166E-02				
338.63	144.	16.13	0.98	1.134E-02	338.40	12.010	8.048E-01	AC228
352.40	250.	8.69	1.28	1.091E-02	351.99	37.100	4.743E-01	PB214
463.34	40.	34.21	1.50	8.342E-03	463.51	10.000	PBC<MDA	SB125
510.58	118.	21.06	1.59	7.592E-03	510.72	22.500	4.632E-01	TL208
583.77	244.	8.11	1.32	6.678E-03	583.14	86.000	3.255E-01	TL208
609.99	179.	9.78	1.47	6.406E-03	609.32	46.090	4.669E-01	BI214
662.78	23.	38.82	1.50	5.937E-03	661.62	84.620	PBC<MDA	CS137
727.98	51.	30.79	1.15	5.437E-03	727.17	11.800	6.102E-01	BI212
796.03	26.	38.18	1.50	5.016E-03	795.76	85.400	PBC<MDA	CS134
912.26	146.	12.60	1.24	4.441E-03	911.07	29.000	8.671E-01	AC228
969.76	100.	18.22	1.41	4.209E-03	968.90	17.460	1.051E+00	AC228

1121.22	49.	24.22	1.35	3.708E-03	1120.28	15.040	6.758E-01	BI214
1462.10	604.	4.16	1.83	2.940E-03	1460.75	10.700	1.482E+01	K40
1765.93	18.	23.57	1.00	2.481E-03	1764.51	15.920	3.449E-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	
148.27	74.72	472.	106.	0.053	92.14	1.004	BI-207	D
154.20	77.68	325.	360.	0.180	26.46	1.007	PB-214	D
477.57	238.89	152.	726.	0.363	13.26	1.122	PB-212	D
483.76	241.98	162.	89.	0.044	68.92	1.124	PB-214	D
600.33	300.29	105.	44.	0.022	108.66	0.819	PB-212	s
658.18	329.20	149.	67.	0.033	99.19	0.928	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	149.57	75.00	1030.	135.	0.067	100.42	1.499s
PB-214	153.79	77.11	860.	299.	0.150	44.41	1.499D
PB-212	153.79	77.11	856.	303.	0.152	44.41	1.499D
TH-234	185.70	93.06	839.	142.	0.071	83.31	1.499s
TH-234	185.71	93.07	810.	146.	0.073	82.58	1.499s
RA-226	371.64	185.99	358.	158.	0.079	61.83	1.445s
PB-212	477.52	238.91	417.	553.	0.277	19.93	1.499
PB-214	591.02	295.64	160.	128.	0.064	48.90	1.499s
AC-228	677.05	338.63	143.	141.	0.071	48.40	0.976s
PB-214	704.57	352.39	110.	248.	0.124	25.87	1.499
SB-125	926.57	463.34	82.	40.	0.020	102.62	1.499s
TL-208	1021.10	510.58	151.	102.	0.051	63.18	1.590s
TL-208	1167.55	583.77	57.	241.	0.121	24.34	1.317s
BI-214	1220.01	609.99	52.	178.	0.089	29.34	1.469s
CS-137	1325.66	662.78	33.	23.	0.012	116.45	1.499s
BI-212	1456.11	727.98	60.	51.	0.025	92.37	1.150
CS-134	1592.29	796.03	37.	26.	0.013	114.55	1.502s
AC-228	1824.87	912.26	57.	144.	0.072	37.80	1.236s
AC-228	1939.93	969.76	62.	100.	0.050	54.65	1.415
BI-214	2243.04	1121.22	34.	49.	0.024	72.65	1.354
K-40	2925.21	1462.10	9.	601.	0.301	12.48	1.830
BI-214	3533.29	1765.93	0.	18.	0.009	70.71	0.999s

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		-4.3393E-02					
			477.56	-4.339E-02	%(	4.432E-01 1.28E-01	G
K-40		1.4816E+01					
			1460.75	1.482E+01	(P	4.050E-01 6.19E-01	G
MN-54		5.1666E-03					
			834.81	5.167E-03	%(P	4.857E-02 1.37E-02	G
CO-57		-1.8484E-03					
			122.07	-1.848E-03	%(	5.328E-02 1.58E-02	G K
			136.43	-5.085E-02	%	4.186E-01 1.25E-01	G
CO-60		-2.1476E-03					
			1332.51	-2.148E-03	%(P	5.535E-02 1.49E-02	G K
			1173.23	4.414E-02	% P	6.267E-02 1.98E-02	G K
Sr-85		-2.0919E-02					
			514.00	-2.092E-02	%(	6.683E-02 2.00E-02	G
Kr-85		-4.8555E+02					
			513.99	-4.855E+02	%(P	1.467E+03 4.37E+02	G
Y-88		0.0000E+00					
			1836.01	0.000E+00	%(	5.593E-02 1.42E-02	G K
			898.02	8.533E-03	& P	5.552E-02 1.58E-02	G
NB-94		9.3118E-03					
			871.10	9.312E-03	&(P	4.589E-02 1.31E-02	G K
			702.50	-2.549E-03	% P	4.906E-02 1.39E-02	G K
Ag-108M		4.1454E-03					
			722.95	4.145E-03	&(	6.239E-02 1.78E-02	G K
			614.37	-2.609E-02	% P	6.532E-02 1.96E-02	G
			433.93	-2.976E-03	&	4.906E-02 1.42E-02	G
CD-109		2.7743E-01					
			88.04	2.774E-01	%(P	1.298E+00 3.89E-01	G
SN-113		3.2132E-03					
			391.71	3.213E-03	%(	6.877E-02 1.99E-02	G K
			255.04	-4.018E-01	& P	2.065E+00 6.13E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	1.2253E-01						
		427.95	3.690E-02	%(P	1.426E-01	4.21E-02	G K
		600.77	-3.344E-02	& P	2.763E-01	7.97E-02	G
		636.15	7.896E-02	% P	3.929E-01	1.14E-01	G
		463.51	3.760E-01	*(P	4.203E-01	1.33E-01	G
		176.29	3.006E-02	& P	6.549E-01	1.94E-01	G
I-131	-1.2856E-02						
		364.48	-1.286E-02	%(	7.841E-02	2.30E-02	G K
		636.97	-1.309E-02	%	1.036E+00	2.93E-01	G
		284.29	0.000E+00	%	1.088E+00	3.18E-01	G
CS-134	3.0510E-02						
		604.66	1.617E-02	%(P	4.528E-02	1.35E-02	G K
		795.76	4.690E-02	*(P	5.674E-02	1.82E-02	G
		569.29	-6.059E-02	% P	2.919E-01	8.48E-02	G
		801.84	-5.307E-02	%	5.359E-01	1.51E-01	G
CS-137	3.6132E-02						
		661.62	3.613E-02	(P	4.563E-02	1.46E-02	G
CE-139	-5.1109E-03						
		165.85	-5.111E-03	&(P	5.300E-02	1.57E-02	G
EU-152	-1.5675E-02						
		121.78	-1.567E-02	&(P	1.257E-01	3.73E-02	G K
		344.30	1.484E-02	% P	1.526E-01	4.46E-02	G
		1408.08	-1.179E-03	% P	2.228E-01	5.74E-02	G
		964.00	-1.849E-02	& P	4.780E-01	1.35E-01	G
		1112.07	1.866E-01	& P	4.389E-01	1.32E-01	G
		778.90	-7.569E-03	% P	3.143E-01	8.60E-02	G
EU-154	1.9897E-02						
		123.10	1.990E-02	%(P	1.058E-01	3.16E-02	G K
		1274.80	2.599E-02	% P	1.691E-01	4.77E-02	G
		723.30	-2.621E-03	& P	4.116E-01	1.19E-01	G
		1004.80	-3.582E-02	% P	3.403E-01	9.63E-02	G
EU-155	-7.9404E-03						
		86.45	-7.940E-03	&(	1.932E-01	5.77E-02	G K
		105.31	1.002E-01	%	2.124E-01	6.44E-02	G
HG-203	3.6399E-03						
		279.17	3.640E-03	&(	5.138E-02	1.51E-02	G K
		72.87	3.673E-03	% P	1.603E+00	4.80E-01	G
		70.83	-2.676E-01	%	1.664E+00	4.96E-01	G
		82.50	-2.405E-01	&	2.807E+00	8.38E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	3.2552E-01						
		583.14	3.255E-01	@(P	5.104E-02	2.67E-02	G
		510.72	4.632E-01	+ P	2.724E-01	1.13E-01	G
PB-212	6.4256E-01						
		238.63	6.393E-01	(P	1.131E-01	4.29E-02	G K
							Energy duplication
		77.11	7.813E-01	+	3.583E-01	1.16E-01	G
		74.81	6.573E-01	?(P	7.439E-01	2.29E-01	G
PB-214	4.4936E-01						
		351.99	4.753E-01	(P	9.866E-02	4.13E-02	G K
		295.22	3.993E-01	(P	1.926E-01	6.60E-02	G
							Energy duplication
		77.11	1.262E+00	+ P	5.872E-01	1.89E-01	G
		241.92	1.071E-01	% P	7.430E-01	2.22E-01	G
BI-212	6.1022E-01						
		727.17	6.102E-01	(P	4.704E-01	1.91E-01	G K
		1620.56	1.948E-01	&	1.916E+00	5.15E-01	G
		785.42	9.415E-01	% P	2.333E+00	6.98E-01	G
BI-214	4.6691E-01						
		609.32	4.669E-01	@(P	9.540E-02	4.60E-02	G K
		1764.51	3.449E-01	- P	1.447E-01	8.34E-02	G
		1120.28	6.758E-01	+ P	4.175E-01	1.65E-01	G
RA-224	9.0534E-01						
		241.00	9.053E-01	%(P	1.326E+00	4.06E-01	G
RA-226	2.0046E+00						
		185.99	2.005E+00	*(	1.157E+00	4.13E-01	G
AC-228	9.0935E-01						
		911.07	8.671E-01	@(P	2.277E-01	1.11E-01	G K
		968.90	1.051E+00	(P	4.166E-01	1.93E-01	G
		338.40	8.048E-01	@(P	3.321E-01	1.32E-01	G
TH-227	-7.6360E-02						
		236.00	-7.636E-02	&(P	4.770E-01	1.42E-01	G K
		256.25	6.975E-04	& P	5.905E-01	1.73E-01	G
PA-234	-2.8401E-02						
		98.44	-2.840E-02	%(	1.762E-01	5.26E-02	G K
		946.00	-7.840E-03	%	2.888E-01	8.07E-02	G
		131.28	1.537E-03	%	2.182E-01	6.47E-02	G
		94.67	-1.144E-01	%	3.533E-01	1.07E-01	G
		883.24	7.708E-02	%	3.471E-01	9.93E-02	G
		926.70	-1.234E-02	%	4.722E-01	1.31E-01	G

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 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26-7.970E-02 %   4.389E-01 1.28E-01 G

TH-234       1.4953E+00
                           63.29 7.426E-01 %(P 2.250E+00 6.76E-01 G K
                           92.80 1.900E+00  (P 1.759E+00 5.45E-01 G
                           92.38 2.164E+00  (P 2.094E+00 6.47E-01 G

AM-241      -4.9507E-03
                           59.54-4.951E-03 %(P 2.721E-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	-4.0624E-02	-4.3393E-02	3.8411E-01	3.8412E-01	4.149E-01
K-40		1.4816E+01	1.4816E+01	1.8560E+00	2.0361E+00	
MN-54	#A	5.1087E-03	5.1666E-03	4.1000E-02	4.1001E-02	4.802E-02
CO-57	#B	-1.8244E-03	-1.8484E-03	4.7512E-02	4.7512E-02	5.259E-02
CO-60	#B	-2.1436E-03	-2.1476E-03	5.4515E-02	5.4515E-02	5.525E-02

Sr-85	#A	-1.9813E-02	-2.0919E-02	5.9890E-02	5.9901E-02	6.330E-02
Kr-85	#A	-4.8553E+02	-4.8555E+02	1.4706E+03	1.4709E+03	1.466E+03
Y-88	#B	0.0000E+00	0.0000E+00	4.2598E-02	4.2598E-02	5.412E-02
NB-94	#B	9.3118E-03	9.3118E-03	3.9425E-02	3.9429E-02	4.589E-02
Ag-108M	#B	4.1451E-03	4.1454E-03	5.3487E-02	5.3487E-02	6.239E-02
CD-109	#A	2.7528E-01	2.7743E-01	1.1671E+00	1.1672E+00	1.288E+00
SN-113	#B	3.1164E-03	3.2132E-03	5.9790E-02	5.9790E-02	6.669E-02
SB-125	#B	1.2211E-01	1.2253E-01	1.3025E-01	1.3044E-01	1.421E-01
I-131	#B	-8.2960E-03	-1.2856E-02	6.9110E-02	6.9113E-02	5.060E-02
CS-134	#B	3.0368E-02	3.0510E-02	3.5515E-02	3.5557E-02	4.507E-02
CS-137	#A	3.6121E-02	3.6132E-02	4.3667E-02	4.3715E-02	4.561E-02
CE-139	#A	-4.9817E-03	-5.1109E-03	5.0382E-02	5.0383E-02	5.166E-02
EU-152	#B	-1.5663E-02	-1.5675E-02	1.2698E-01	1.2699E-01	1.256E-01
EU-154	#B	1.9875E-02	1.9897E-02	9.4933E-02	9.4939E-02	1.057E-01
EU-155	#B	-7.9250E-03	-7.9404E-03	1.7311E-01	1.7311E-01	1.929E-01
HG-203	#B	3.3749E-03	3.6399E-03	4.5191E-02	4.5192E-02	4.764E-02
TL-208	#	3.2552E-01	3.2552E-01	7.9997E-02	8.2084E-02	
PB-212	#	6.4256E-01	6.4256E-01	1.2948E-01	1.3447E-01	1.131E-01
PB-214	#	4.4936E-01	4.4936E-01	1.1720E-01	1.1991E-01	9.866E-02
BI-212		6.1022E-01	6.1022E-01	5.7125E-01	5.7229E-01	
BI-214		4.6691E-01	4.6691E-01	1.3785E-01	1.4035E-01	
RA-224	#A	9.0534E-01	9.0534E-01	1.2189E+00	1.2200E+00	1.326E+00
RA-226	#	2.0046E+00	2.0046E+00	1.2395E+00	1.2446E+00	
AC-228		9.0935E-01	9.0935E-01	2.5200E-01	2.5718E-01	
TH-227	#B	-7.6360E-02	-7.6360E-02	4.4874E-01	4.4876E-01	4.770E-01
PA-234	#B	-2.8401E-02	-2.8401E-02	1.5790E-01	1.5791E-01	1.762E-01
TH-234	#B	1.4953E+00	1.4953E+00	1.2870E+00	1.2896E+00	2.250E+00
AM-241	#A	-4.9506E-03	-4.9507E-03	6.3444E-01	6.3444E-01	2.721E-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) 1.9132565E+01 pCi/gm
Total Decayed Activity (270.1 to 1999.1 keV) 1.9132576E+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_9AUG2006_1832.An1

Sample description
FSS-OOL-10-02-011-F

Spectrum Filename: C:\GammaVision\Spectra\101F_9AUG2006_1832.An1

Acquisition information
Start time: 09-Aug-2006 18:32:45
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: 1.4410E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.4410E+03) =
6.9396E+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	04-Aug-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. 11 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.5358

***** 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	125.	33.73	1.50	1.654E-02				
74.78	125.	33.73	1.50	1.654E-02	74.81	9.600	PBC<MDA	PB212
77.23	240.	18.12	1.50	1.720E-02	77.11	17.500	7.470E-01	PB212
					77.11	10.700	1.203E+00	PB214
77.23	236.	18.12	1.50	1.720E-02	77.11	17.500	7.355E-01	PB212
					77.11	10.700	1.203E+00	PB214
93.16	101.	33.59	1.50	1.985E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
93.16	106.	33.26	1.50	1.989E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
144.02	67.	39.88	0.84	2.071E-02				
154.22	68.	41.14	1.00	2.029E-02				
186.44	119.	25.20	1.38	1.856E-02	185.99	3.280	1.831E+00	RA226
239.03	705.	6.07	1.05	1.555E-02	238.63	43.100	9.760E-01	PB212
					241.92	7.470	5.740E+00	PB214
270.48	49.	29.28	1.42	1.399E-02				
295.79	118.	14.73	0.92	1.290E-02	295.22	19.200	4.394E-01	PB214
301.48	53.	37.97	1.26	1.267E-02				
338.46	126.	18.74	1.08	1.135E-02	338.40	12.010	8.504E-01	AC228
352.18	222.	10.23	1.20	1.092E-02	351.99	37.100	5.082E-01	PB214
510.97	83.	19.02	1.18	7.587E-03	510.72	22.500	3.667E-01	TL208
583.69	194.	11.22	1.46	6.679E-03	583.14	86.000	3.126E-01	TL208
609.96	139.	11.74	1.27	6.406E-03	609.32	46.090	4.375E-01	BI214
728.05	29.	33.80	1.50	5.443E-03	727.17	11.800	PBC<MDA	BI212
795.10	21.	39.42	1.50	5.016E-03	795.76	85.400	PBC<MDA	CS134
912.00	119.	12.36	1.19	4.442E-03	911.07	29.000	8.533E-01	AC228
969.16	89.	17.64	1.87	4.211E-03	968.90	17.460	1.126E+00	AC228

1120.39	60.	24.58	1.57	3.711E-03	1120.28	15.040	1.012E+00	BI214
1462.09	559.	4.32	1.86	2.940E-03	1460.75	10.700	1.658E+01	K40
1766.12	24.	20.41	0.73	2.481E-03	1764.51	15.920	5.594E-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	
287.66	144.02	290.	67.	0.033	119.64	0.841	U-235	s
308.06	154.22	315.	68.	0.034	123.43	0.997	XE-138	s
477.76	239.03	824.	212.	0.106	60.95	1.049	PB-212	
540.69	270.48	84.	49.	0.025	87.83	1.424	AC-228	s
602.71	301.48	138.	53.	0.027	113.92	1.263	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	149.13	74.78	905.	125.	0.062	101.19	1.499
PB-212	153.79	77.11	825.	240.	0.120	54.37	1.499D
PB-214	153.79	77.11	828.	236.	0.118	54.37	1.499D
TH-234	185.90	93.16	664.	101.	0.051	100.77	1.499s
TH-234	185.91	93.16	641.	106.	0.053	99.79	1.499s
RA-226	372.32	186.33	345.	118.	0.059	72.21	1.499s
PB-212	477.57	238.94	328.	437.	0.219	22.30	1.499
PB-214	591.12	295.69	123.	116.	0.058	48.21	1.499
AC-228	676.70	338.46	150.	124.	0.062	56.21	1.075s
PB-214	704.43	352.32	106.	198.	0.099	30.31	1.499s
TL-208	1021.88	510.97	77.	67.	0.033	57.06	1.179s
TL-208	1167.38	583.69	82.	192.	0.096	33.67	1.462s
BI-214	1219.95	609.96	52.	138.	0.069	35.23	1.272
BI-212	1456.26	728.05	36.	29.	0.014	101.39	1.499s
CS-134	1590.42	795.10	25.	21.	0.010	118.25	1.502s
AC-228	1824.36	912.00	31.	117.	0.059	37.08	1.194
AC-228	1938.74	969.16	46.	88.	0.044	52.92	1.875
BI-214	2241.36	1120.39	39.	60.	0.030	73.74	1.571s
K-40	2925.20	1462.09	8.	557.	0.278	12.96	1.863
BI-214	3533.68	1766.12	0.	24.	0.012	61.24	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	MDA Value pCi/gm	COMMENTS
BE-7		1.4146E-01					
			477.56	1.415E-01	%(	4.633E-01 1.37E-01	G
K-40		1.6582E+01					
			1460.75	1.658E+01	(P	4.801E-01 7.20E-01	G
MN-54		-1.1994E-02					
			834.81	-1.199E-02	%(P	6.159E-02 1.76E-02	G
CO-57		-1.3712E-02					
			122.07	-1.371E-02	%(	5.755E-02 1.72E-02	G K
			136.43	-1.246E-02	%	4.605E-01 1.36E-01	G
CO-60		1.9824E-02					
			1332.51	1.982E-02	%(P	6.838E-02 1.98E-02	G K
			1173.23	-1.192E-02	& P	9.174E-02 2.62E-02	G K
Sr-85		-2.7096E-02					
			514.00	-2.710E-02	&(	7.343E-02 2.20E-02	G
Kr-85		-6.2556E+02					
			513.99	-6.256E+02	&(P	1.610E+03 4.81E+02	G
Y-88		-1.5000E-02					
			1836.01	-1.500E-02	%(	8.024E-02 2.24E-02	G K
			898.02	1.481E-02	% P	6.849E-02 1.98E-02	G
NB-94		-1.3863E-03					
			871.10	-1.386E-03	%(P	5.096E-02 1.38E-02	G K
			702.50	-7.419E-05	% P	5.269E-02 1.46E-02	G K
Ag-108M		1.4705E-02					
			722.95	1.470E-02	&(	5.522E-02 1.61E-02	G K
			614.37	-3.349E-02	& P	7.708E-02 2.32E-02	G
			433.93	2.216E-02	&	4.279E-02 1.31E-02	G
CD-109		3.7111E-01					
			88.04	3.711E-01	%(P	1.585E+00 4.75E-01	G
SN-113		2.5872E-02					
			391.71	2.587E-02	%(	7.449E-02 2.23E-02	G K
			255.04	-3.480E-02	& P	2.106E+00 6.13E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	5.5716E-02						
		427.95	5.572E-02	&(P	1.427E-01	4.27E-02	G K
		600.77	4.180E-02	% P	2.852E-01	8.20E-02	G
		636.15	-2.448E-02	% P	4.013E-01	1.11E-01	G
		463.51	1.370E-01	% P	5.126E-01	1.51E-01	G
		176.29	-1.304E-01	% P	7.355E-01	2.18E-01	G
I-131	2.2680E-02						
		364.48	2.268E-02	&(	7.313E-02	2.17E-02	G K
		636.97	-6.359E-02	&	1.113E+00	3.14E-01	G
		284.29	-7.920E-02	%	1.006E+00	2.93E-01	G
CS-134	2.2588E-02						
		604.66	2.342E-03	%(P	5.002E-02	1.40E-02	G K
		795.76	4.573E-02	*(P	5.695E-02	1.84E-02	G
		569.29	1.118E-01	& P	2.367E-01	7.16E-02	G
		801.84	1.329E-01	%	6.085E-01	1.75E-01	G
CS-137	-1.6507E-03						
		661.62	-1.651E-03	&(P	8.623E-02	2.45E-02	G
CE-139	-4.2496E-03						
		165.85	-4.250E-03	&(P	4.863E-02	1.43E-02	G
EU-152	2.6682E-02						
		121.78	2.668E-02	%(P	1.320E-01	3.93E-02	G K
		344.30	3.235E-02	& P	1.503E-01	4.41E-02	G
		1408.08	4.564E-02	% P	2.235E-01	6.12E-02	G
		964.00	-6.396E-02	% P	5.506E-01	1.57E-01	G
		1112.07	-1.273E-01	& P	6.049E-01	1.75E-01	G
		778.90	1.366E-02	% P	4.829E-01	1.36E-01	G
EU-154	-3.0849E-02						
		123.10	-3.085E-02	%(P	1.141E-01	3.42E-02	G K
		1274.80	6.450E-02	% P	2.160E-01	6.32E-02	G
		723.30	4.336E-02	& P	2.624E-01	7.49E-02	G
		1004.80	-5.041E-02	% P	3.785E-01	1.07E-01	G
EU-155	1.7985E-03						
		86.45	1.799E-03	&(	1.880E-01	5.59E-02	G K
		105.31	8.457E-02	%	2.270E-01	6.85E-02	G
HG-203	3.5203E-02						
		279.17	3.520E-02	&(	5.053E-02	1.56E-02	G K
		72.87	-6.299E-01	% P	1.549E+00	4.68E-01	G
		70.83	1.409E-01	&	1.735E+00	5.14E-01	G
		82.50	-9.373E-02	%	3.266E+00	9.72E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	3.2381E-01						
		583.14	3.126E-01	*(P	7.342E-02	3.56E-02	G
		510.72	3.667E-01	*(P	2.397E-01	8.65E-02	G
PB-212	6.6218E-01						
		238.63	6.108E-01	(P	1.216E-01	4.61E-02	G K
							Energy duplication
		77.11	7.470E-01	(	4.252E-01	1.35E-01	G
		74.81	7.382E-01	&(P	8.440E-01	2.59E-01	G
PB-214	4.5197E-01						
		351.99	4.585E-01	@(P	1.175E-01	4.68E-02	G K
		295.22	4.393E-01	(P	2.053E-01	7.17E-02	G
							Energy duplication
		77.11	1.203E+00	+ P	6.970E-01	2.21E-01	G
		241.92	1.101E-01	% P	7.995E-01	2.38E-01	G
BI-212	4.2089E-01						
		727.17	4.209E-01	(P	4.458E-01	1.46E-01	G K
		1620.56	1.008E-01	%	1.888E+00	4.82E-01	G
		785.42	7.462E-01	% P	2.556E+00	7.46E-01	G
BI-214	4.6880E-01						
		609.32	4.375E-01	(P	1.153E-01	5.18E-02	G K
		1764.51	5.594E-01	(P	1.750E-01	1.16E-01	G
		1120.28	1.012E+00	+ P	5.332E-01	2.50E-01	G
RA-224	7.5455E-01						
		241.00	7.546E-01	%(P	1.488E+00	4.52E-01	G
RA-226	1.8174E+00						
		185.99	1.817E+00	(	1.374E+00	4.37E-01	G
AC-228	9.3407E-01						
		911.07	8.533E-01	(P	2.074E-01	1.07E-01	G K
		968.90	1.126E+00	(P	4.363E-01	2.00E-01	G
		338.40	8.504E-01	@(P	4.118E-01	1.62E-01	G
TH-227	5.0076E-03						
		236.00	5.008E-03	%(P	4.925E-01	1.45E-01	G K
		256.25	4.939E-02	& P	6.791E-01	1.99E-01	G
PA-234	-9.5489E-02						
		98.44	-9.549E-02	%(	1.906E-01	5.79E-02	G K
		946.00	-1.851E-02	%	3.300E-01	9.23E-02	G
		131.28	3.675E-03	&	2.451E-01	7.26E-02	G
		94.67	-1.283E-02	%	3.735E-01	1.11E-01	G
		883.24	9.454E-02	&	4.555E-01	1.31E-01	G
		926.70	1.892E-01	%	4.753E-01	1.42E-01	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26 1.746E-01 &   3.445E-01 1.05E-01 G

TH-234       1.5466E+00
                           63.29 1.253E+00 %(P 2.516E+00 7.61E-01 G K
                           92.80 1.658E+00 *(P 1.896E+00 5.84E-01 G
                           92.38 1.862E+00 &(P 2.257E+00 6.92E-01 G

AM-241      -9.5204E-02
                           59.54-9.520E-02 &(P 3.463E-01 1.04E-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	1.3217E-01	1.4146E-01	4.1115E-01	4.1123E-01	4.328E-01
K-40		1.6582E+01	1.6582E+01	2.1576E+00	2.3522E+00	
MN-54	#A	-1.1856E-02	-1.1994E-02	6.0631E-02	6.0635E-02	6.088E-02
CO-57	#B	-1.3529E-02	-1.3712E-02	5.1732E-02	5.1738E-02	5.678E-02
CO-60	#B	1.9786E-02	1.9824E-02	5.9514E-02	5.9525E-02	6.825E-02

Sr-85	#A	-2.5623E-02	-2.7096E-02	6.6075E-02	6.6092E-02	6.943E-02
Kr-85	#A	-6.2554E+02	-6.2556E+02	1.6083E+03	1.6087E+03	1.610E+03
Y-88	#B	-1.4498E-02	-1.5000E-02	6.7216E-02	6.7222E-02	7.756E-02
NB-94	#B	-1.3863E-03	-1.3863E-03	6.1633E-02	6.1633E-02	5.096E-02
Ag-108M	#B	1.4703E-02	1.4705E-02	4.8273E-02	4.8280E-02	5.522E-02
CD-109	#A	3.6815E-01	3.7111E-01	1.4263E+00	1.4264E+00	1.573E+00
SN-113	#B	2.5070E-02	2.5872E-02	6.6761E-02	6.6777E-02	7.218E-02
SB-125	#B	5.5517E-02	5.5716E-02	1.2819E-01	1.2823E-01	1.422E-01
I-131	#B	1.4447E-02	2.2680E-02	6.5094E-02	6.5107E-02	4.658E-02
CS-134	#B	2.2480E-02	2.2588E-02	2.7246E-02	2.7276E-02	4.978E-02
CS-137	#A	-1.6501E-03	-1.6507E-03	1.3001E-01	1.3001E-01	8.621E-02
CE-139	#A	-4.1390E-03	-4.2496E-03	4.7250E-02	4.7250E-02	4.737E-02
EU-152	#B	2.6661E-02	2.6682E-02	1.1794E-01	1.1795E-01	1.319E-01
EU-154	#B	-3.0813E-02	-3.0849E-02	1.0944E-01	1.0945E-01	1.140E-01
EU-155	#B	1.7949E-03	1.7985E-03	1.6756E-01	1.6756E-01	1.877E-01
HG-203	#B	3.2568E-02	3.5203E-02	4.6946E-02	4.6988E-02	4.675E-02
TL-208	#	3.2381E-01	3.2381E-01	1.1037E-01	1.1188E-01	
PB-212	#	6.6218E-01	6.6218E-01	1.4978E-01	1.5438E-01	1.216E-01
PB-214	#	4.5197E-01	4.5197E-01	1.3047E-01	1.3295E-01	1.175E-01
BI-212	#A	4.2089E-01	4.2089E-01	4.3678E-01	4.3742E-01	4.458E-01
BI-214		4.6880E-01	4.6880E-01	1.6650E-01	1.6860E-01	
RA-224	#A	7.5455E-01	7.5455E-01	1.3555E+00	1.3562E+00	1.488E+00
RA-226	#	1.8174E+00	1.8174E+00	1.3124E+00	1.3164E+00	1.374E+00
AC-228		9.3407E-01	9.3407E-01	2.7033E-01	2.7543E-01	
TH-227	#B	5.0076E-03	5.0076E-03	4.3542E-01	4.3542E-01	4.925E-01
PA-234	#B	-9.5489E-02	-9.5489E-02	1.7360E-01	1.7368E-01	1.906E-01
TH-234	#B	1.5466E+00	1.5466E+00	1.2287E+00	1.2317E+00	2.516E+00
AM-241	#A	-9.5201E-02	-9.5204E-02	3.2978E-01	3.2982E-01	3.463E-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 (50.2 to 1999.1 keV) 1.8309048E+01 pCi/gm
Total Decayed Activity (50.2 to 1999.1 keV) 1.8309048E+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_9AUG2006_1909.An1

Sample description
FSS-OOL-10-02-013-F

Spectrum Filename: C:\GammaVision\Spectra\101F_9AUG2006_1909.An1

Acquisition information
Start time: 09-Aug-2006 19:09:36
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: 1.3980E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.3980E+03) =
7.1531E+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	04-Aug-2006 13:30:00
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. 13 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.5635

***** 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	149.	25.63	1.50	1.654E-02	74.81	9.600	9.043E-01	PB212
77.07	236.	16.15	1.50	1.720E-02	77.11	17.500	7.563E-01	PB212
					77.11	10.700	1.217E+00	PB214
77.07	232.	16.15	1.50	1.720E-02	77.11	17.500	7.443E-01	PB212
					77.11	10.700	1.217E+00	PB214
93.64	82.	30.67	1.02	1.998E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
186.34	109.	27.12	1.32	1.856E-02	185.99	3.280	1.730E+00	RA226
209.74	85.	31.73	0.75	1.719E-02				
238.97	536.	4.93	1.12	1.556E-02	238.63	43.100	7.637E-01	PB212
241.78	75.	27.88	1.12	1.541E-02	241.00	3.900	PBC<MDA	RA224
					241.92	7.470	PBC<MDA	PB214
271.61	61.	33.03	0.59	1.394E-02				
295.42	110.	18.08	0.96	1.291E-02	295.22	19.200	4.236E-01	PB214
338.66	116.	16.27	1.31	1.134E-02	338.40	12.010	8.071E-01	AC228
352.11	154.	12.04	1.16	1.092E-02	351.99	37.100	3.638E-01	PB214
463.30	61.	27.27	0.88	8.345E-03				
463.30	61.	27.27	0.88	8.345E-03	463.51	10.000	6.879E-01	SB125
511.27	78.	21.60	0.95	7.583E-03	510.72	22.500	3.491E-01	TL208
583.69	184.	10.17	1.27	6.679E-03	583.14	86.000	3.061E-01	TL208
609.72	177.	10.33	1.72	6.409E-03	609.32	46.090	5.766E-01	BI214
728.37	41.	31.52	1.20	5.435E-03	727.17	11.800	6.069E-01	BI212
795.80	40.	25.82	1.72	5.016E-03	795.76	85.400	9.088E-02	CS134
912.03	100.	11.94	1.43	4.442E-03	911.07	29.000	7.341E-01	AC228
968.79	93.	18.00	1.05	4.213E-03	968.90	17.460	1.216E+00	AC228
1121.25	43.	30.96	1.25	3.708E-03	1120.28	15.040	7.416E-01	BI214
1462.05	490.	4.56	1.83	2.940E-03	1460.75	10.700	1.496E+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	209.74	250.	85.	0.043	95.20	0.748	NP-239	s
477.63	238.95	82.	536.	0.268	14.79	1.122	PB-212	D
483.26	241.76	184.	75.	0.038	83.65	1.124	PB-214	D
542.96	271.61	138.	61.	0.031	99.10	0.590	PA-234	s
926.50	463.30	89.	36.	0.018	120.91	0.883	SB-125	

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	705.	149.	0.074	76.88	1.499s
PB-212	153.79	77.11	606.	236.	0.118	48.45	1.499D
PB-214	153.79	77.11	610.	232.	0.116	48.45	1.499D
TH-234	186.13	93.27	541.	92.	0.046	99.36	1.499s
TH-234	186.11	93.27	554.	99.	0.049	99.05	1.499s
RA-226	372.34	186.34	296.	89.	0.044	88.25	1.499s
PB-212	477.69	239.00	263.	432.	0.216	21.12	1.499
PB-214	590.96	295.61	136.	102.	0.051	55.49	1.499
AC-228	677.10	338.66	98.	114.	0.057	48.80	1.306s
PB-214	704.51	352.36	75.	142.	0.071	35.50	1.499
TL-208	1022.48	511.27	86.	62.	0.031	64.79	0.951s
TL-208	1167.39	583.69	53.	182.	0.091	30.50	1.269
BI-214	1219.53	609.75	46.	170.	0.085	32.38	1.716s
Ag-108M	1223.55	611.76	107.	-39.	-0.020	121.57	1.499s
BI-212	1456.56	728.20	34.	32.	0.016	91.15	1.499
CS-134	1592.07	795.92	24.	35.	0.017	77.37	1.502s
AC-228	1824.41	912.03	21.	98.	0.049	35.83	1.434
AC-228	1937.99	968.79	46.	92.	0.046	53.99	1.051s
BI-214	2243.10	1121.25	35.	43.	0.021	92.89	1.251
K-40	2925.11	1462.05	5.	487.	0.244	13.68	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	MDA Value pCi/gm	COMMENTS
BE-7		-3.8247E-02					
			477.56	-3.825E-02	&(	4.871E-01 1.39E-01	G
K-40		1.4959E+01					
			1460.75	1.496E+01	(P	3.960E-01 6.86E-01	G
MN-54		-1.0393E-02					
			834.81	-1.039E-02	%(P	5.553E-02 1.57E-02	G
CO-57		-5.3721E-03					
			122.07	-5.372E-03	&(	5.320E-02 1.58E-02	G K
			136.43	1.631E-02	&	4.345E-01 1.29E-01	G
CO-60		-7.6762E-03					
			1332.51	-7.676E-03	&(P	6.819E-02 1.88E-02	G K
			1173.23	6.454E-03	& P	8.429E-02 2.37E-02	G K
Sr-85		-1.4325E-02					
			514.00	-1.432E-02	%(	6.966E-02 2.05E-02	G
Kr-85		-3.4778E+02					
			513.99	-3.478E+02	%(P	1.529E+03 4.48E+02	G
Y-88		0.0000E+00					
			1836.01	0.000E+00	%(	3.102E-02 4.21E-03	G K
			898.02	-6.597E-03	& P	6.772E-02 1.89E-02	G
NB-94		2.5041E-03					
			871.10	2.504E-03	&(P	5.044E-02 1.38E-02	G K
			702.50	-2.728E-03	& P	5.160E-02 1.44E-02	G K
Ag-108M		-4.3608E-03					
			722.95	-4.361E-03	&(	6.083E-02 1.71E-02	G K
			614.37	-6.603E-02	& P	8.544E-02 2.67E-02	G
			433.93	-5.580E-03	%	5.294E-02 1.53E-02	G
CD-109		4.4147E-02					
			88.04	4.415E-02	&(P	1.495E+00 4.43E-01	G
SN-113		2.1997E-04					
			391.71	2.200E-04	%(	7.055E-02 2.01E-02	G K
			255.04	-5.397E-02	% P	2.120E+00 6.17E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	2.7729E-02						
		427.95	2.773E-02	%(P	1.317E-01	3.83E-02	G K
		600.77	-6.718E-02	& P	2.576E-01	7.49E-02	G
		636.15	1.818E-02	% P	4.042E-01	1.12E-01	G
		463.51	2.661E-01	% P	4.624E-01	1.41E-01	G
		176.29	-1.707E-03	& P	6.811E-01	2.00E-01	G
I-131	5.9713E-04						
		364.48	5.971E-04	%(	7.753E-02	2.21E-02	G K
		636.97	1.330E-02	&	9.763E-01	2.69E-01	G
		284.29	-1.056E-02	&	1.115E+00	3.23E-01	G
CS-134	2.9386E-02						
		604.66	-1.379E-02	%(P	5.533E-02	1.61E-02	G K
		795.76	7.873E-02	@(P	5.782E-02	2.06E-02	G
		569.29	-1.021E-02	% P	3.416E-01	9.60E-02	G
		801.84	-6.861E-02	%	6.064E-01	1.70E-01	G
CS-137	3.9720E-02						
		661.62	3.972E-02	%(P	5.463E-02	1.73E-02	G
CE-139	-2.2991E-03						
		165.85	-2.299E-03	%(P	5.713E-02	1.69E-02	G
EU-152	-2.8253E-02						
		121.78	-2.825E-02	%(P	1.614E-01	4.81E-02	G K
		344.30	2.834E-02	% P	1.534E-01	4.49E-02	G
		1408.08	-6.562E-03	% P	2.803E-01	7.26E-02	G
		964.00	-1.086E-01	& P	5.816E-01	1.68E-01	G
		1112.07	1.634E-01	& P	4.142E-01	1.23E-01	G
		778.90	-6.321E-02	& P	4.305E-01	1.22E-01	G
EU-154	-1.8851E-02						
		123.10	-1.885E-02	&(P	1.124E-01	3.34E-02	G K
		1274.80	-7.949E-03	% P	2.241E-01	6.18E-02	G
		723.30	-3.414E-02	& P	2.916E-01	8.25E-02	G
		1004.80	-5.763E-02	% P	4.131E-01	1.17E-01	G
EU-155	1.1003E-01						
		86.45	1.100E-01	%(	1.841E-01	5.61E-02	G K
		105.31	2.710E-02	&	2.147E-01	6.39E-02	G
HG-203	1.1829E-03						
		279.17	1.183E-03	%(	6.028E-02	1.76E-02	G K
		72.87	-5.615E-01	& P	1.528E+00	4.61E-01	G
		70.83	-3.723E-02	%	2.452E+00	7.29E-01	G
		82.50	-5.196E-02	%	2.818E+00	8.35E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	3.1499E-01						
		583.14	3.061E-01	(P	6.159E-02	3.15E-02	G
		510.72	3.491E-01	(P	2.604E-01	9.51E-02	G
PB-212	6.2193E-01						
		238.63	6.219E-01	(P	1.127E-01	4.44E-02	G K
							Energy duplication
		77.11	7.563E-01	+	3.770E-01	1.22E-01	G
		74.81	9.043E-01	& P	7.698E-01	2.40E-01	G
PB-214	3.5895E-01						
		351.99	3.381E-01	(P	1.025E-01	4.06E-02	G K
		295.22	3.993E-01	(P	2.220E-01	7.51E-02	G
							Energy duplication
		77.11	1.217E+00	+ P	6.184E-01	2.00E-01	G
		241.92	-4.379E-03	% P	7.746E-01	2.28E-01	G
BI-212	4.8450E-01						
		727.17	4.845E-01	(P	4.504E-01	1.50E-01	G K
		1620.56	4.764E-01	%	1.705E+00	4.80E-01	G
		785.42	-4.582E-01	& P	2.914E+00	8.29E-01	G
BI-214	5.5629E-01						
		609.32	5.563E-01	(P	1.121E-01	6.05E-02	G K
		1764.51	-1.071E-02	% P	1.803E-01	2.45E-02	G
		1120.28	7.416E-01	+ P	5.257E-01	2.32E-01	G
RA-224	9.4267E-01						
		241.00	9.427E-01	%(P	1.337E+00	4.11E-01	G
RA-226	1.4064E+00						
		185.99	1.406E+00	*(	1.314E+00	4.14E-01	G
AC-228	7.5550E-01						
		911.07	7.341E-01	(P	1.806E-01	8.94E-02	G K
		968.90	1.216E+00	+ P	4.488E-01	2.21E-01	G
		338.40	8.071E-01	*(P	3.467E-01	1.34E-01	G
TH-227	2.7773E-02						
		236.00	2.777E-02	&(P	4.109E-01	1.21E-01	G K
		256.25	-1.841E-02	& P	6.036E-01	1.75E-01	G
PA-234	2.1275E-03						
		98.44	2.128E-03	%(	2.050E-01	6.07E-02	G K
		946.00	2.153E-03	%	3.114E-01	8.54E-02	G
		131.28	6.836E-02	%	2.272E-01	6.82E-02	G
		94.67	-7.017E-02	%	3.375E-01	1.01E-01	G
		883.24	-5.692E-02	&	4.666E-01	1.31E-01	G
		926.70	1.491E-01	%	4.298E-01	1.26E-01	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26-3.755E-03 &   5.003E-01 1.41E-01 G

TH-234       1.4704E+00
                           63.29 1.189E+00 %(P 2.425E+00 7.33E-01 G K
                           92.80 1.600E+00 *(P 1.821E+00 5.61E-01 G
                           92.38 1.745E+00 *(P 2.105E+00 6.46E-01 G

AM-241       2.9534E-02
                           59.54 2.953E-02 %(P 3.408E-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

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
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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	-3.5734E-02	-3.8247E-02	4.1804E-01	4.1804E-01	4.551E-01
K-40		1.4959E+01	1.4959E+01	2.0559E+00	2.2229E+00	
MN-54	#A	-1.0273E-02	-1.0393E-02	5.5481E-02	5.5484E-02	5.489E-02
CO-57	#B	-5.3003E-03	-5.3721E-03	4.7380E-02	4.7381E-02	5.249E-02
CO-60	#B	-7.6617E-03	-7.6762E-03	6.0284E-02	6.0286E-02	6.806E-02

Sr-85	#A	-1.3545E-02	-1.4325E-02	6.1503E-02	6.1508E-02	6.587E-02
Kr-85	#A	-3.4777E+02	-3.4778E+02	1.6436E+03	1.6437E+03	1.529E+03
Y-88	#B	0.0000E+00	0.0000E+00	1.2627E-02	1.2629E-02	2.998E-02
NB-94	#B	2.5041E-03	2.5041E-03	4.1275E-02	4.1275E-02	5.044E-02
Ag-108M	#B	-4.3605E-03	-4.3608E-03	5.1316E-02	5.1317E-02	6.082E-02
CD-109	#A	4.3795E-02	4.4147E-02	1.3303E+00	1.3303E+00	1.483E+00
SN-113	#B	2.1315E-04	2.1997E-04	6.0357E-02	6.0357E-02	6.836E-02
SB-125	#B	2.7630E-02	2.7729E-02	1.1478E-01	1.1479E-01	1.312E-01
I-131	#B	3.8021E-04	5.9713E-04	6.6289E-02	6.6289E-02	4.936E-02
CS-134	#B	2.9244E-02	2.9386E-02	2.3010E-02	2.3070E-02	5.506E-02
CS-137	#A	3.9707E-02	3.9720E-02	5.1794E-02	5.1843E-02	5.461E-02
CE-139	#A	-2.2392E-03	-2.2991E-03	6.0501E-02	6.0501E-02	5.564E-02
EU-152	#B	-2.8231E-02	-2.8253E-02	1.5737E-01	1.5738E-01	1.613E-01
EU-154	#B	-1.8829E-02	-1.8851E-02	1.1193E-01	1.1193E-01	1.122E-01
EU-155	#B	1.0981E-01	1.1003E-01	1.6839E-01	1.6850E-01	1.837E-01
HG-203	#B	1.0943E-03	1.1829E-03	5.2652E-02	5.2652E-02	5.576E-02
TL-208		3.1499E-01	3.1499E-01	9.7314E-02	9.8928E-02	
PB-212	#	6.2193E-01	6.2193E-01	1.3326E-01	1.3781E-01	1.127E-01
PB-214	#	3.5895E-01	3.5895E-01	1.2016E-01	1.2186E-01	1.025E-01
BI-212	#	4.8450E-01	4.8450E-01	4.5091E-01	4.5174E-01	4.504E-01
BI-214		5.5629E-01	5.5629E-01	1.8130E-01	1.8400E-01	
RA-224	#A	9.4267E-01	9.4267E-01	1.2333E+00	1.2345E+00	1.337E+00
RA-226	#	1.4064E+00	1.4064E+00	1.2412E+00	1.2437E+00	1.314E+00
AC-228		7.5550E-01	7.5550E-01	2.3306E-01	2.3693E-01	
TH-227	#B	2.7773E-02	2.7773E-02	3.6231E-01	3.6231E-01	4.109E-01
PA-234	#B	2.1275E-03	2.1275E-03	1.8207E-01	1.8207E-01	2.050E-01
TH-234	#B	1.4704E+00	1.4704E+00	1.1764E+00	1.1792E+00	2.425E+00
AM-241	#A	2.9533E-02	2.9534E-02	3.0382E-01	3.0382E-01	3.408E-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 (271.1 to 1999.1 keV) 1.6585403E+01 pCi/gm
Total Decayed Activity (271.1 to 1999.1 keV) 1.6585403E+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_14AUG2006_1133.An1

Sample description
FSS-OOL-10-02-024-F-I

Spectrum Filename: C:\GammaVision\Spectra\101F_14AUG2006_1133.An1

Acquisition information

Start time:	14-Aug-2006 11:33:57
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:	1.6180E+03
Activity scaling factor:	1.0000E+06/(1.0000E+00* 1.6180E+03) = 6.1805E+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	10-Aug-2006 07:45:00
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: 0.4983

***** 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
63.32	73.	40.46	0.97	1.121E-02	63.29	3.900	PBC<MDA	TH234
74.57	162.	18.37	1.00	1.657E-02	74.81	9.600	8.247E-01	PB212
77.39	280.	11.60	1.01	1.736E-02	77.11	17.500	7.763E-01	PB212
					77.11	10.700	1.253E+00	PB214
93.22	121.	31.09	1.50	1.989E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
128.89	59.	41.16	0.69	2.110E-02				
186.75	93.	31.14	1.10	1.854E-02	185.99	3.280	1.280E+00	RA226
209.13	100.	27.84	0.77	1.722E-02				
238.93	673.	4.48	1.12	1.556E-02	238.63	43.100	8.294E-01	PB212
241.62	79.	29.37	1.12	1.542E-02	241.00	3.900	PBC<MDA	RA224
					241.92	7.470	PBC<MDA	PB214
270.49	79.	27.67	1.05	1.399E-02				
276.75	50.	37.28	1.37	1.371E-02				
295.50	114.	19.24	0.98	1.291E-02	295.22	19.200	3.782E-01	PB214
300.55	45.	39.44	0.92	1.271E-02				
338.53	158.	15.37	0.81	1.135E-02	338.40	12.010	9.547E-01	AC228
352.18	249.	10.01	1.34	1.092E-02	351.99	37.100	5.090E-01	PB214
463.48	50.	23.15	1.50	8.342E-03	463.51	10.000	5.021E-01	SB125
511.69	105.	18.72	1.40	7.576E-03	510.72	22.500	4.346E-01	TL208
583.64	200.	8.56	1.17	6.679E-03	583.14	86.000	2.867E-01	TL208
609.96	161.	12.76	1.43	6.406E-03	609.32	46.090	4.524E-01	BI214
727.32	69.	22.30	1.62	5.442E-03	727.17	11.800	8.911E-01	BI212
911.64	137.	14.83	1.27	4.444E-03	911.07	29.000	8.753E-01	AC228
969.61	107.	16.03	1.51	4.209E-03	968.90	17.460	1.207E+00	AC228
1121.33	71.	27.46	2.41	3.711E-03	1120.28	15.040	1.063E+00	BI214
1461.85	505.	4.54	1.97	2.941E-03	1460.75	10.700	1.335E+01	K40

1621.80	13.	27.74	2.00	2.682E-03	1620.56	2.750	1.472E+00	BI212
1765.20	21.	21.82	0.79	2.481E-03	1764.51	15.920	4.347E-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	
126.20	63.32	383.	73.	0.037	121.38	0.966	PA-234	l
148.70	74.89	362.	162.	0.081	55.11	1.005	PB-214	D
154.35	77.72	387.	280.	0.140	34.81	1.007	PB-214	D
257.39	128.89	259.	75.	0.038	97.05	0.690	AC-228	
417.93	209.13	270.	100.	0.050	83.52	0.770	AC-228	s
477.56	238.91	117.	673.	0.336	13.43	1.122	PB-212	D
482.94	241.61	233.	79.	0.040	88.11	1.124	PB-214	D
540.71	270.49	165.	79.	0.039	83.00	1.053	AC-228	s
600.85	300.55	130.	45.	0.023	118.32	0.924	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	149.44	74.94	958.	165.	0.082	80.51	1.499
PB-212	153.79	77.11	848.	267.	0.133	49.81	1.499D
PB-214	153.79	77.11	852.	263.	0.132	49.81	1.499D
TH-234	186.03	93.22	727.	121.	0.061	93.26	1.499
RA-226	372.54	186.44	412.	81.	0.041	111.23	1.499s
PB-212	477.49	238.90	382.	540.	0.270	19.78	1.499
PB-214	591.07	295.66	205.	107.	0.053	62.61	1.499
AC-228	676.85	338.53	146.	156.	0.078	46.12	0.806s
PB-214	704.22	352.21	105.	238.	0.119	26.44	1.499
SB-125	926.86	463.48	47.	50.	0.025	69.44	1.499s
TL-208	1023.33	511.69	101.	89.	0.044	56.17	1.405s
TL-208	1167.30	583.64	43.	197.	0.099	25.69	1.167
BI-214	1219.96	609.96	74.	160.	0.080	38.29	1.428s
BI-212	1454.79	727.32	53.	69.	0.034	66.90	1.623s
AC-228	1823.63	911.64	71.	135.	0.068	44.50	1.268s
AC-228	1939.63	969.61	53.	106.	0.053	48.09	1.514s
BI-214	2243.25	1121.33	67.	71.	0.036	82.38	2.414s
K-40	2924.72	1461.85	8.	503.	0.252	13.62	1.970
BI-212	3244.83	1621.80	0.	13.	0.007	83.21	1.999
BI-214	3531.83	1765.20	0.	21.	0.010	65.47	0.787s

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		-4.9574E-03					
			477.56	-4.957E-03	%(	3.621E-01 1.01E-01	G
K-40		1.3346E+01					
			1460.75	1.335E+01	(P	4.189E-01 6.09E-01	G
MN-54		-8.5391E-03					
			834.81	-8.539E-03	%(P	6.031E-02 1.72E-02	G
CO-57		9.4560E-03					
			122.07	9.456E-03	%(	5.200E-02 1.55E-02	G K
			136.43	-8.491E-02	%	4.592E-01 1.37E-01	G
CO-60		2.1831E-02					
			1332.51	2.183E-02	&(P	5.518E-02 1.64E-02	G K
			1173.23	-9.142E-03	% P	7.960E-02 2.26E-02	G K
Sr-85		-1.9975E-02					
			514.00	-1.997E-02	&(	6.702E-02 2.00E-02	G
Kr-85		-4.7138E+02					
			513.99	-4.714E+02	&(P	1.486E+03 4.41E+02	G
Y-88		0.0000E+00					
			1836.01	0.000E+00	%(	2.661E-02 3.61E-03	G K
			898.02	-2.271E-05	% P	5.891E-02 1.62E-02	G
NB-94		3.7682E-03					
			871.10	3.768E-03	%(P	4.890E-02 1.36E-02	G K
			702.50	1.152E-02	& P	4.908E-02 1.43E-02	G K
Ag-108M		-8.7086E-04					
			722.95	-8.709E-04	&(	6.779E-02 1.92E-02	G K
			614.37	-1.439E-02	% P	6.670E-02 1.96E-02	G
			433.93	2.499E-02	%	4.273E-02 1.31E-02	G
CD-109		-9.0897E-02					
			88.04	-9.090E-02	%(P	1.617E+00 4.82E-01	G
SN-113		-1.3228E-02					
			391.71	-1.323E-02	%(	7.693E-02 2.26E-02	G K
			255.04	1.715E-01	% P	1.877E+00 5.51E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	1.4985E-01						
		427.95	3.087E-02	&(P	1.085E-01	3.19E-02	G K
		600.77	-3.625E-02	& P	2.317E-01	6.62E-02	G
		636.15	-1.037E-02	& P	4.530E-01	1.27E-01	G
		463.51	5.021E-01	*(P	3.467E-01	1.20E-01	G
		176.29	1.465E-01	% P	6.299E-01	1.88E-01	G
I-131	-2.2900E-02						
		364.48	-2.290E-02	%(	7.846E-02	2.34E-02	G K
		636.97	-5.274E-04	&	1.022E+00	2.88E-01	G
		284.29	-8.661E-03	%	8.797E-01	2.55E-01	G
CS-134	7.7366E-04						
		604.66	7.737E-04	%(P	5.243E-02	1.48E-02	G K
		795.76	3.642E-02	% P	6.323E-02	1.95E-02	G
		569.29	9.074E-03	% P	2.632E-01	7.36E-02	G
		801.84	5.799E-02	%	5.520E-01	1.55E-01	G
CS-137	2.1794E-02						
		661.62	2.179E-02	%(P	5.670E-02	1.69E-02	G
CE-139	2.8777E-02						
		165.85	2.878E-02	&(P	3.911E-02	1.21E-02	G
EU-152	3.7872E-04						
		121.78	3.787E-04	%(P	1.540E-01	4.56E-02	G K
		344.30	-2.012E-02	% P	1.559E-01	4.55E-02	G
		1408.08	2.386E-02	% P	2.643E-01	7.15E-02	G
		964.00	-8.160E-03	% P	3.988E-01	1.09E-01	G
		1112.07	-1.118E-01	% P	5.822E-01	1.68E-01	G
		778.90	-7.333E-02	& P	3.554E-01	1.02E-01	G
EU-154	1.9839E-02						
		123.10	1.984E-02	%(P	1.054E-01	3.15E-02	G K
		1274.80	-3.097E-03	& P	1.795E-01	4.88E-02	G
		723.30	2.373E-02	% P	2.863E-01	8.15E-02	G
		1004.80	-7.244E-04	& P	4.338E-01	1.22E-01	G
EU-155	-4.6637E-02						
		86.45	-4.664E-02	%(	1.520E-01	4.57E-02	G K
		105.31	1.996E-02	%	2.155E-01	6.42E-02	G
HG-203	-8.5126E-03						
		279.17	-8.513E-03	&(	5.987E-02	1.77E-02	G K
		72.87	-4.031E-01	& P	1.397E+00	4.20E-01	G
		70.83	5.614E-01	%	2.204E+00	6.62E-01	G
		82.50	-4.185E-01	%	2.935E+00	8.78E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	2.8669E-01						
		583.14	2.867E-01	(P	4.817E-02	2.49E-02	G
		510.72	4.346E-01	+ P	2.424E-01	9.62E-02	G
PB-212	6.9176E-01						
		238.63	6.720E-01	(P	1.167E-01	4.48E-02	G K
							Energy duplication
		77.11	7.403E-01	(	3.841E-01	1.23E-01	G
		74.81	8.653E-01	+ P	7.729E-01	2.40E-01	G
PB-214	4.8956E-01						
		351.99	4.896E-01	(P	1.040E-01	4.35E-02	G K
		295.22	3.600E-01	- P	2.337E-01	7.64E-02	G
							Energy duplication
		77.11	1.194E+00	+ P	6.295E-01	2.01E-01	G
		241.92	-2.271E-02	% P	8.370E-01	2.48E-01	G
BI-212	1.0009E+00						
		727.17	8.911E-01	*(P	4.784E-01	2.01E-01	G K
		1620.56	1.472E+00	(	8.346E-01	4.09E-01	G
		785.42	-2.545E-01	% P	2.404E+00	6.74E-01	G
BI-214	4.4786E-01						
		609.32	4.524E-01	@(P	1.209E-01	5.82E-02	G K
		1764.51	4.347E-01	(P	1.558E-01	9.69E-02	G
		1120.28	1.063E+00	+ P	6.113E-01	2.94E-01	G
RA-224	7.2038E-01						
		241.00	7.204E-01	%(P	1.446E+00	4.39E-01	G
RA-226	1.1123E+00						
		185.99	1.112E+00	*(	1.334E+00	4.12E-01	G
AC-228	9.9064E-01						
		911.07	8.753E-01	@(P	2.716E-01	1.32E-01	G K
		968.90	1.207E+00	*(P	4.150E-01	1.95E-01	G
		338.40	9.547E-01	@(P	3.618E-01	1.49E-01	G
TH-227	-1.4241E-01						
		236.00	-1.424E-01	%(P	4.744E-01	1.42E-01	G K
		256.25	1.226E-01	% P	5.448E-01	1.61E-01	G
PA-234	3.6552E-02						
		98.44	3.655E-02	&(	1.945E-01	5.82E-02	G K
		946.00	2.101E-02	%	2.668E-01	7.44E-02	G
		131.28	-4.058E-02	%	2.305E-01	6.89E-02	G
		94.67	-1.053E-01	%	3.445E-01	1.04E-01	G
		883.24	1.512E-01	&	3.646E-01	1.09E-01	G
		926.70	-2.535E-02	%	4.592E-01	1.27E-01	G

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 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26 1.815E-02 %   3.871E-01 1.09E-01 G

TH-234       1.2852E+00
                           63.29 9.690E-01 %(P 2.328E+00 7.02E-01 G K
                           92.80 1.696E+00 &(P 1.796E+00 5.54E-01 G
                           92.38 1.397E-02 & P 2.116E+00 6.27E-01 G

AM-241      -3.3924E-02
                           59.54-3.392E-02 %(P 3.162E-01 9.41E-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	-4.6969E-03	-4.9574E-03	3.0435E-01	3.0435E-01	3.430E-01
K-40		1.3346E+01	1.3346E+01	1.8264E+00	1.9759E+00	
MN-54	#A	-8.4606E-03	-8.5391E-03	6.1244E-02	6.1246E-02	5.976E-02
CO-57	#B	9.3556E-03	9.4560E-03	4.6617E-02	4.6620E-02	5.144E-02
CO-60	#B	2.1798E-02	2.1831E-02	4.9249E-02	4.9264E-02	5.510E-02

Sr-85	#A	-1.9106E-02	-1.9975E-02	5.9920E-02	5.9930E-02	6.411E-02
Kr-85	#A	-4.7137E+02	-4.7138E+02	1.5049E+03	1.5051E+03	1.486E+03
Y-88	#B	0.0000E+00	0.0000E+00	1.0834E-02	1.0836E-02	2.590E-02
NB-94	#B	3.7682E-03	3.7682E-03	4.0776E-02	4.0777E-02	4.890E-02
Ag-108M	#B	-8.7081E-04	-8.7086E-04	5.7675E-02	5.7675E-02	6.779E-02
CD-109	#A	-9.0321E-02	-9.0897E-02	1.6283E+00	1.6283E+00	1.606E+00
SN-113	#B	-1.2900E-02	-1.3228E-02	6.7894E-02	6.7898E-02	7.503E-02
SB-125	#F	1.4943E-01	1.4985E-01	1.0706E-01	1.0740E-01	1.082E-01
I-131	#B	-1.6000E-02	-2.2900E-02	7.0073E-02	7.0084E-02	5.482E-02
CS-134	#B	7.7070E-04	7.7366E-04	4.4449E-02	4.4449E-02	5.223E-02
CS-137	#A	2.1788E-02	2.1794E-02	5.0615E-02	5.0630E-02	5.668E-02
CE-139	#A	2.8180E-02	2.8777E-02	3.6245E-02	3.6281E-02	3.830E-02
EU-152	#B	3.7848E-04	3.7872E-04	1.3688E-01	1.3688E-01	1.539E-01
EU-154	#B	1.9821E-02	1.9839E-02	9.4392E-02	9.4398E-02	1.053E-01
EU-155	#B	-4.6563E-02	-4.6637E-02	1.3718E-01	1.3721E-01	1.518E-01
HG-203	#B	-8.0018E-03	-8.5126E-03	5.3110E-02	5.3112E-02	5.628E-02
TL-208		2.8669E-01	2.8669E-01	7.4529E-02	7.6269E-02	
PB-212	#	6.9176E-01	6.9176E-01	1.3842E-01	1.4383E-01	1.167E-01
PB-214	#	4.8956E-01	4.8956E-01	1.3052E-01	1.3342E-01	1.040E-01
BI-212		1.0009E+00	1.0009E+00	5.3640E-01	5.3937E-01	
BI-214		4.4786E-01	4.4786E-01	1.7267E-01	1.7451E-01	
RA-224	#A	7.2038E-01	7.2038E-01	1.3165E+00	1.3171E+00	1.446E+00
RA-226	#A	1.1123E+00	1.1123E+00	1.2373E+00	1.2389E+00	1.334E+00
AC-228	#	9.9064E-01	9.9064E-01	2.6759E-01	2.7338E-01	
TH-227	#B	-1.4241E-01	-1.4241E-01	4.3970E-01	4.3977E-01	4.744E-01
PA-234	#B	3.6552E-02	3.6552E-02	1.7463E-01	1.7464E-01	1.945E-01
TH-234	#B	1.2852E+00	1.2852E+00	1.2597E+00	1.2617E+00	2.328E+00
AM-241	#A	-3.3923E-02	-3.3924E-02	3.2516E-01	3.2516E-01	3.161E-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) 1.6072565E+01 pCi/gm
Total Decayed Activity (270.1 to 1999.1 keV) 1.6072565E+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_8AUG2006_1425.An1

Sample description
FSS-OOL-10-02-004-F-A

Spectrum Filename: C:\GammaVision\Spectra\102F_8AUG2006_1425.An1

Acquisition information
Start time: 08-Aug-2006 14:25:59
Live time: 2000
Real time: 2012
Dead time: 0.61 %
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: 1.8420E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.8420E+03) =
5.4289E+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	07-Aug-2006 11:06:00
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. 8 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.6956

***** 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
77.17	105.	28.95	1.50	9.541E-03	77.11	10.700	7.571E-01	PB214
					77.11	17.500	4.629E-01	PB212
77.17	105.	28.95	1.50	9.541E-03	77.11	10.700	7.571E-01	PB214
					77.11	17.500	4.629E-01	PB212
239.09	221.	8.48	1.22	1.379E-02	238.63	43.100	2.724E-01	PB212
242.65	35.	38.65	1.22	1.363E-02	241.92	7.470	2.542E-01	PB214
270.99	44.	31.04	1.60	1.240E-02				
296.05	95.	19.50	1.27	1.144E-02	295.22	19.200	3.159E-01	PB214
338.86	74.	22.82	1.17	1.005E-02	338.40	12.010	4.493E-01	AC228
352.66	135.	13.41	1.24	9.660E-03	351.99	37.100	2.750E-01	PB214
511.68	65.	21.06	1.23	6.695E-03	510.72	22.500	3.166E-01	TL208
584.90	64.	17.06	1.86	5.873E-03	583.14	86.000	9.268E-02	TL208
610.35	97.	13.64	1.62	5.640E-03	609.32	46.090	2.727E-01	BI214
912.77	31.	25.98	1.68	3.922E-03	911.07	29.000	1.997E-01	AC228
1463.42	235.	6.52	1.94	2.617E-03	1460.75	10.700	6.144E+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	
477.82	238.94	65.	221.	0.110	25.44	1.215	PB-212	D
484.94	242.50	76.	35.	0.018	115.96	1.218	XE-138	D
541.63	270.99	57.	44.	0.022	93.11	1.596	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	412.	105.	0.053	86.85	1.500D
PB-212	153.80	77.11	412.	105.	0.053	86.85	1.500D
PB-212	477.80	239.09	157.	194.	0.097	34.90	1.500
PB-214	591.43	295.89	61.	82.	0.041	52.32	1.500
AC-228	677.96	339.14	67.	40.	0.020	97.92	1.500
PB-214	704.91	352.61	44.	112.	0.056	37.71	1.500s
TL-208	1023.13	511.68	36.	65.	0.032	63.18	1.228s
TL-208	1168.98	584.57	21.	48.	0.024	58.42	1.499s
BI-214	1220.54	610.35	24.	97.	0.048	40.91	1.619
AC-228	1825.69	912.77	17.	31.	0.015	77.94	1.679s
K-40	2927.76	1463.43	2.	218.	0.109	20.48	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		-3.9153E-04					
			477.56	-3.915E-04	&(	3.510E-01 9.82E-02	G
K-40		5.6911E+00					
			1460.75	5.691E+00	(P	2.324E-01 3.89E-01	G
MN-54		1.4147E-02					
			834.81	1.415E-02	%(P	3.626E-02 1.08E-02	G
CO-57		2.4099E-04					
			122.07	2.410E-04	&(	3.984E-02 1.17E-02	G K
			136.43	2.843E-02	%	2.949E-01 8.69E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CO-60	2.0326E-04						
		1332.51	2.033E-04	&(P	4.629E-02	1.19E-02	G K
		1173.23	-2.057E-04	%	4.223E-02	1.09E-02	G K
Sr-85	-8.1084E-03						
		514.00	-8.108E-03	%(	3.915E-02	1.14E-02	G
Kr-85	-1.7453E+02						
		513.99	-1.745E+02	%(	8.894E+02	2.58E+02	G
Y-88	-2.2724E-05						
		1836.01	-2.272E-05	%(P	5.827E-02	1.48E-02	G K
		898.02	1.067E-02	& P	3.042E-02	8.75E-03	G
NB-94	9.8853E-03						
		871.10	9.885E-03	%(	3.843E-02	1.10E-02	G K
		702.50	1.925E-03	%	3.482E-02	9.50E-03	G K
Ag-108M	-7.2288E-03						
		722.95	-7.229E-03	%(	4.798E-02	1.36E-02	G K
		614.37	-3.780E-02	% P	5.934E-02	1.83E-02	G
		433.93	-3.057E-03	&	3.277E-02	9.26E-03	G
CD-109	6.1887E-01						
		88.04	6.189E-01	%(P	1.551E+00	4.68E-01	G
SN-113	-4.6939E-03						
		391.71	-4.694E-03	%(	4.162E-02	1.18E-02	G K
		255.04	6.049E-01	&	1.120E+00	3.43E-01	G
SB-125	-1.7906E-02						
		427.95	-1.791E-02	%(P	9.099E-02	2.56E-02	G K
		600.77	1.203E-02	% P	1.524E-01	4.15E-02	G
		636.15	-1.444E-03	& P	2.767E-01	7.39E-02	G
		463.51	1.612E-01	% P	2.715E-01	8.34E-02	G
		176.29	7.592E-03	& P	4.638E-01	1.35E-01	G
I-131	-3.7867E-03						
		364.48	-3.787E-03	&(	3.619E-02	1.03E-02	G K
		636.97	-1.095E-03	&	4.689E-01	1.25E-01	G
		284.29	1.076E-01	%	4.416E-01	1.30E-01	G
CS-134	-5.3250E-04						
		604.66	-5.325E-04	%(	3.375E-02	9.19E-03	G K
		795.76	-7.666E-03	%	4.592E-02	1.29E-02	G
		569.29	3.099E-03	%	2.032E-01	5.54E-02	G
		801.84	-1.096E-01	& P	5.449E-01	1.56E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CS-137	-4.3416E-03						
		661.62	-4.342E-03	%(	4.330E-02	1.21E-02	G
CE-139	-4.4967E-03						
		165.85	-4.497E-03	%(P	3.716E-02	1.09E-02	G
EU-152	-1.3369E-02						
		121.78	-1.337E-02	&(P	1.143E-01	3.37E-02	G K
		344.30	-8.550E-03	&	1.157E-01	3.32E-02	G
		1408.08	8.682E-03	%	1.983E-01	5.08E-02	G
		964.00	-6.611E-04	% P	2.436E-01	6.25E-02	G
		1112.07	-5.942E-02	&	4.619E-01	1.31E-01	G
		778.90	6.278E-02	& P	2.719E-01	7.74E-02	G
EU-154	-2.2068E-04						
		123.10	-2.207E-04	&(P	8.465E-02	2.48E-02	G K
		1274.80	3.676E-02	%	1.714E-01	4.89E-02	G
		723.30	-3.666E-02	% P	2.243E-01	6.36E-02	G
		1004.80	-4.164E-02	%	2.781E-01	7.80E-02	G
EU-155	-1.1118E-02						
		86.45	-1.112E-02	%(P	1.995E-01	5.88E-02	G K
		105.31	4.221E-02	%	1.531E-01	4.57E-02	G
HG-203	1.0912E-02						
		279.17	1.091E-02	&(P	2.879E-02	8.60E-03	G K
		72.87	7.289E-02	&	1.350E+00	3.99E-01	G
		70.83	-7.788E-02	%	2.724E+00	8.05E-01	G
		82.50	1.941E-02	%	3.087E+00	9.12E-01	G
TL-208	6.9691E-02						
		583.14	6.969E-02	&(P	3.470E-02	1.37E-02	G
		510.72	3.166E-01	+	1.494E-01	6.68E-02	G
PB-212	2.3898E-01						
		238.63	2.390E-01	(	7.540E-02	2.78E-02	G K
							Energy duplication
		77.11	4.629E-01	+	4.278E-01	1.34E-01	G
		74.81	2.942E-01	& P	9.217E-01	2.77E-01	G
PB-214	2.4406E-01						
		351.99	2.289E-01	*(P	6.869E-02	2.89E-02	G K
		295.22	2.734E-01	(	1.307E-01	4.77E-02	G
							Energy duplication
		77.11	7.571E-01	+	6.996E-01	2.19E-01	G
		241.92	3.740E-02	%	5.057E-01	1.48E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
BI-212	8.4986E-02						
		727.17	8.499E-02	&(	3.063E-01	8.87E-02	G K
		1620.56	-3.734E-02	% P	1.827E+00	4.54E-01	G
		785.42	3.464E-01	% P	1.916E+00	5.41E-01	G
BI-214	2.7274E-01						
		609.32	2.727E-01	(	7.223E-02	3.73E-02	G K
		1764.51	-6.858E-02	% P	4.078E-01	1.13E-01	G
		1120.28	-5.109E-02	&	4.251E-01	1.20E-01	G
RA-224	-1.6271E-01						
		241.00	-1.627E-01	&(P	9.584E-01	2.82E-01	G
RA-226	3.6245E-01						
		185.99	3.625E-01	%(P	9.085E-01	2.72E-01	G
AC-228	2.1317E-01						
		911.07	1.997E-01	&(P	1.431E-01	5.23E-02	G K
		968.90	-4.532E-02	& P	2.973E-01	8.40E-02	G
		338.40	2.456E-01	(	2.479E-01	8.02E-02	G
TH-227	-7.8070E-02						
		236.00	-7.807E-02	%(P	3.322E-01	9.87E-02	G K
		256.25	1.900E-01	%	3.214E-01	9.90E-02	G
PA-234	2.8805E-02						
		98.44	2.881E-02	%(	1.731E-01	5.14E-02	G K
		946.00	-3.489E-03	&	2.420E-01	6.58E-02	G
		131.28	5.682E-03	%	1.648E-01	4.84E-02	G
		94.67	-2.321E-02	&	3.563E-01	1.06E-01	G
		883.24	3.070E-02	%	3.058E-01	8.32E-02	G
		926.70	2.935E-04	%	3.341E-01	8.72E-02	G
		569.26	5.828E-03	%	3.005E-01	8.20E-02	G
TH-234	2.5037E-01						
		63.29	2.504E-01	&(P	3.559E+00	1.05E+00	G K
		92.80	6.911E-01	%	1.859E+00	5.61E-01	G
		92.38	-5.212E-02	% P	1.982E+00	5.83E-01	G
AM-241	-7.9453E-03						
		59.54	-7.945E-03	%(	5.362E-01	1.58E-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:
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	-3.8578E-04	-3.9153E-04	2.9472E-01	2.9472E-01	3.459E-01
K-40		5.6911E+00	5.6911E+00	1.1665E+00	1.2094E+00	2.324E-01
MN-54	#A	1.4111E-02	1.4147E-02	3.2262E-02	3.2271E-02	3.617E-02
CO-57	#B	2.4028E-04	2.4099E-04	3.5030E-02	3.5030E-02	3.973E-02
CO-60	#B	2.0317E-04	2.0326E-04	3.5756E-02	3.5756E-02	4.627E-02
Sr-85	#A	-8.0103E-03	-8.1084E-03	3.4098E-02	3.4101E-02	3.868E-02
Kr-85	#A	-1.7453E+02	-1.7453E+02	7.7295E+02	7.7301E+02	8.893E+02
Y-88	#B	-2.2556E-05	-2.2724E-05	5.8397E-04	5.8397E-04	5.784E-02
NB-94	#B	9.8853E-03	9.8853E-03	3.3069E-02	3.3074E-02	3.843E-02
Ag-108M	#B	-7.2287E-03	-7.2288E-03	4.0892E-02	4.0894E-02	4.798E-02
CD-109	#A	6.1779E-01	6.1887E-01	1.4037E+00	1.4042E+00	1.548E+00
SN-113	#B	-4.6619E-03	-4.6939E-03	3.5429E-02	3.5430E-02	4.134E-02
SB-125	#B	-1.7892E-02	-1.7906E-02	1.0903E-01	1.0903E-01	9.092E-02
I-131	#B	-3.4326E-03	-3.7867E-03	3.0911E-02	3.0911E-02	3.280E-02
CS-134	#B	-5.3194E-04	-5.3250E-04	2.7580E-02	2.7580E-02	3.372E-02
CS-137	#A	-4.3412E-03	-4.3416E-03	3.6237E-02	3.6238E-02	4.330E-02
CE-139	#A	-4.4709E-03	-4.4967E-03	3.6420E-02	3.6421E-02	3.694E-02
EU-152	#B	-1.3367E-02	-1.3369E-02	1.2293E-01	1.2293E-01	1.143E-01
EU-154	#B	-2.2063E-04	-2.2068E-04	3.0565E-02	3.0565E-02	8.463E-02
EU-155	#B	-1.1113E-02	-1.1118E-02	8.0944E-01	8.0944E-01	1.994E-01

HG-203 #B	1.0729E-02	1.0912E-02	2.5814E-02	2.5821E-02	2.830E-02

TL-208	#	6.9691E-02	6.9691E-02	4.1057E-02	4.1243E-02	3.470E-02
PB-212	#	2.3898E-01	2.3898E-01	8.3406E-02	8.4477E-02	7.540E-02
PB-214	#	2.4406E-01	2.4406E-01	7.8795E-02	7.9976E-02	6.869E-02
BI-212	#B	8.4986E-02	8.4986E-02	2.6622E-01	2.6626E-01	3.063E-01
BI-214		2.7274E-01	2.7274E-01	1.1158E-01	1.1262E-01	
RA-224	#A	-1.6271E-01	-1.6271E-01	1.0310E+00	1.0310E+00	9.584E-01
RA-226	#A	3.6245E-01	3.6245E-01	8.1638E-01	8.1663E-01	9.085E-01
AC-228	#	2.1317E-01	2.1317E-01	1.3378E-01	1.3431E-01	1.431E-01
TH-227	#B	-7.8070E-02	-7.8070E-02	3.0650E-01	3.0653E-01	3.322E-01
PA-234	#B	2.8805E-02	2.8805E-02	1.5430E-01	1.5431E-01	1.731E-01
TH-234	#B	2.5037E-01	2.5037E-01	3.1583E+00	3.1583E+00	3.559E+00
AM-241	#A	-7.9452E-03	-7.9453E-03	4.7420E-01	4.7420E-01	5.362E-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) 6.0334978E+00 pCi/gm
Total Decayed Activity (270.7 to 1999.0 keV) 6.0334978E+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_8AUG2006_1504.An1

Sample description
FSS-OOL-10-02-001-F-A

Spectrum Filename: C:\GammaVision\Spectra\102F_8AUG2006_1504.An1

Acquisition information
Start time: 08-Aug-2006 15:04:26
Live time: 2000
Real time: 2012
Dead time: 0.58 %
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: 1.8040E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.8040E+03) =
5.5432E+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	04-Aug-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. 7 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.7501

***** 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	161.	22.34	1.21	9.261E-03	74.81	9.600	1.392E+00	PB212
					77.11	10.700	1.180E+00	PB214
					77.11	17.500	7.214E-01	PB212
239.13	230.	7.77	1.22	1.378E-02	238.63	43.100	2.892E-01	PB212
242.68	51.	24.08	1.22	1.362E-02	241.00	3.900	PBC<MDA	RA224
					241.92	7.470	3.769E-01	PB214
296.12	68.	20.83	1.38	1.143E-02	295.22	19.200	2.307E-01	PB214
338.59	44.	37.60	1.04	1.005E-02	338.40	12.010	2.753E-01	AC228
352.68	157.	12.53	1.10	9.660E-03	351.99	37.100	3.265E-01	PB214
511.59	29.	32.03	1.50	6.695E-03	510.72	22.500	1.438E-01	TL208
583.62	57.	18.14	1.68	5.885E-03	583.14	86.000	8.354E-02	TL208
610.43	84.	15.32	1.62	5.640E-03	609.32	46.090	2.417E-01	BI214
912.31	54.	19.34	1.55	3.917E-03	911.07	29.000	3.574E-01	AC228
970.61	27.	26.99	1.72	3.718E-03	968.90	17.460	3.165E-01	AC228
1463.45	237.	6.64	1.78	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	
151.91	76.17	418.	161.	0.080	67.01	1.206	PB-214	l
477.89	239.11	44.	230.	0.115	23.30	1.215	PB-212	D
484.99	242.66	51.	51.	0.026	72.24	1.218	XE-138	D
1824.76	912.31	40.	29.	0.015	107.33	1.554	AC-228	s
2927.81	1463.45	4.	236.	0.118	19.89	1.776	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	477.85	239.11	154.	191.	0.095	35.09	1.500
RA-224	484.31	242.34	116.	51.	0.026	96.12	1.500
PB-214	484.24	242.30	128.	50.	0.025	105.42	1.500
PB-214	591.43	295.89	70.	68.	0.034	63.36	1.500
AC-228	677.99	339.16	54.	35.	0.017	103.50	1.500s
PB-214	704.97	352.65	47.	129.	0.064	34.66	1.500
TL-208	1022.96	511.59	28.	29.	0.014	96.09	1.499s
TL-208	1168.38	584.27	23.	39.	0.019	70.16	1.499s
BI-214	1220.71	610.43	24.	84.	0.042	45.96	1.617
AC-228	1826.37	913.11	16.	25.	0.013	88.90	1.679s
AC-228	1941.43	970.61	14.	27.	0.014	80.97	1.718s

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		3.2344E-02					
			477.56	3.234E-02	%(	2.397E-01 6.66E-02	G
K-40		3.4707E-02					
			1460.75	3.471E-02	%(P	5.727E-01 1.54E-01	G
MN-54		1.6817E-03					
			834.81	1.682E-03	%(P	6.379E-02 1.80E-02	G
CO-57		-5.5944E-04					
			122.07	-5.594E-04	&(	3.805E-02 1.11E-02	G K
			136.43	-1.131E-01	&	3.238E-01 9.73E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CO-60	-2.0594E-04						
		1332.51	-2.059E-04	%(P	1.951E-02	2.65E-03	G K
		1173.23	1.103E-02	&	4.745E-02	1.35E-02	G K
Sr-85	7.0126E-03						
		514.00	7.013E-03	%(	3.179E-02	9.14E-03	G
Kr-85	1.5614E+02						
		513.99	1.561E+02	%(	7.023E+02	2.02E+02	G
Y-88	-2.3647E-05						
		1836.01	-2.365E-05	%(P	6.063E-02	1.54E-02	G K
		898.02	-2.081E-03	% P	4.379E-02	1.14E-02	G
NB-94	-3.6095E-03						
		871.10	-3.609E-03	%(	4.187E-02	1.15E-02	G K
		702.50	1.090E-02	%	2.848E-02	8.44E-03	G K
Ag-108M	4.2853E-03						
		722.95	4.285E-03	%(	3.605E-02	9.91E-03	G K
		614.37	-3.012E-02	& P	5.864E-02	1.78E-02	G
		433.93	1.218E-02	%	2.362E-02	7.25E-03	G
CD-109	6.1718E-01						
		88.04	6.172E-01	%(P	1.670E+00	5.03E-01	G
SN-113	-8.9067E-03						
		391.71	-8.907E-03	&(	4.765E-02	1.38E-02	G K
		255.04	-1.235E-01	&	1.332E+00	3.86E-01	G
SB-125	8.9155E-03						
		427.95	8.916E-03	%(P	5.979E-02	1.61E-02	G K
		600.77	3.669E-02	% P	1.662E-01	4.73E-02	G
		636.15	4.129E-02	% P	2.444E-01	6.78E-02	G
		463.51	1.083E-01	% P	2.720E-01	8.03E-02	G
		176.29	-1.432E-02	% P	4.334E-01	1.25E-01	G
I-131	-4.7091E-03						
		364.48	-4.709E-03	%(	3.913E-02	1.10E-02	G K
		636.97	1.211E-01	%	5.202E-01	1.47E-01	G
		284.29	-3.845E-03	%	5.732E-01	1.62E-01	G
CS-134	7.9148E-03						
		604.66	7.915E-03	&(	2.347E-02	6.84E-03	G K
		795.76	2.756E-02	%	4.930E-02	1.52E-02	G
		569.29	3.871E-02	%	2.215E-01	6.31E-02	G
		801.84	-6.467E-02	% P	4.911E-01	1.37E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CS-137	1.4467E-03						
		661.62	1.447E-03	&(	3.242E-02	8.59E-03	G
CE-139	-5.7562E-03						
		165.85	-5.756E-03	%(P	3.667E-02	1.08E-02	G
EU-152	-2.0493E-03						
		121.78	-2.049E-03	&(P	1.140E-01	3.33E-02	G K
		344.30	-1.171E-02	%	9.235E-02	2.63E-02	G
		1408.08	0.000E+00	%	1.919E-01	4.75E-02	G
		964.00	-5.006E-02	& P	3.194E-01	8.88E-02	G
		1112.07	-2.612E-02	%	3.498E-01	9.47E-02	G
		778.90	1.639E-02	% P	2.927E-01	7.95E-02	G
EU-154	5.2728E-03						
		123.10	5.273E-03	&(P	7.729E-02	2.27E-02	G K
		1274.80	-3.551E-02	%	1.928E-01	5.50E-02	G
		723.30	-1.772E-03	% P	1.574E-01	4.09E-02	G
		1004.80	-4.373E-02	&	3.166E-01	8.93E-02	G
EU-155	6.9140E-02						
		86.45	6.914E-02	&(P	2.024E-01	6.08E-02	G K
		105.31	2.925E-03	%	1.573E-01	4.60E-02	G
HG-203	2.9579E-03						
		279.17	2.958E-03	%(P	3.649E-02	1.05E-02	G K
		72.87	-4.747E-01	&	1.772E+00	5.32E-01	G
		70.83	-9.440E-01	&	3.004E+00	9.03E-01	G
		82.50	-4.099E-01	%	2.841E+00	8.44E-01	G
TL-208	5.7120E-02						
		583.14	5.712E-02	*(P	3.674E-02	1.35E-02	G
		510.72	1.438E-01	+	1.371E-01	4.61E-02	G
PB-212	2.4015E-01						
		238.63	2.402E-01	(	7.612E-02	2.81E-02	G K
							Energy duplication
		77.11	2.828E-01	%	4.647E-01	1.42E-01	G
		74.81	5.505E-01	& P	9.545E-01	2.90E-01	G
PB-214	2.5667E-01						
		351.99	2.691E-01	(P	7.257E-02	3.12E-02	G K
		295.22	2.327E-01	(	1.420E-01	4.91E-02	G
							Energy duplication
		77.11	4.625E-01	%	7.600E-01	2.32E-01	G
		241.92	3.648E-01	+	4.064E-01	1.28E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
BI-212	-4.5307E-02						
		727.17	-4.531E-02	%(	3.306E-01	9.27E-02	G K
		1620.56	-3.813E-02	% P	1.865E+00	4.63E-01	G
		785.42	-1.924E-01	% P	2.286E+00	6.37E-01	G
BI-214	2.4166E-01						
		609.32	2.417E-01	(	7.347E-02	3.71E-02	G K
		1764.51	-1.833E-03	% P	3.546E-01	8.98E-02	G
		1120.28	-7.381E-02	&	4.353E-01	1.24E-01	G
RA-224	7.1869E-01						
		241.00	7.187E-01	&(P	7.417E-01	2.35E-01	G
RA-226	3.0314E-01						
		185.99	3.031E-01	%(P	9.818E-01	2.92E-01	G
AC-228	2.2066E-01						
		911.07	1.654E-01	&(P	1.397E-01	4.95E-02	G K
		968.90	3.165E-01	(P	2.308E-01	8.55E-02	G
		338.40	2.148E-01	(	2.294E-01	7.41E-02	G
TH-227	4.8292E-04						
		236.00	4.829E-04	&(P	2.610E-01	7.52E-02	G K
		256.25	8.394E-04	%	3.894E-01	1.11E-01	G
PA-234	-2.0071E-03						
		98.44	-2.007E-03	%(	1.767E-01	5.20E-02	G K
		946.00	4.386E-02	%	1.818E-01	5.14E-02	G
		131.28	4.441E-04	&	1.546E-01	4.51E-02	G
		94.67	-8.677E-02	%	3.591E-01	1.07E-01	G
		883.24	5.221E-02	&	2.877E-01	7.98E-02	G
		926.70	1.573E-02	&	3.865E-01	1.04E-01	G
		569.26	5.717E-02	%	3.274E-01	9.33E-02	G
TH-234	2.6585E-01						
		63.29	2.659E-01	%(P	3.849E+00	1.14E+00	G K
		92.80	3.987E-02	%	1.866E+00	5.52E-01	G
		92.38	8.580E-02	& P	2.245E+00	6.64E-01	G
AM-241	-1.2672E-02						
		59.54	-1.267E-02	&(	5.918E-01	1.75E-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	3.0686E-02	3.2344E-02	1.9972E-01	1.9973E-01	2.274E-01
K-40	A	3.4707E-02	3.4707E-02	4.6349E-01	4.6350E-01	5.727E-01
MN-54	#A	1.6667E-03	1.6817E-03	5.3862E-02	5.3862E-02	6.321E-02
CO-57	#B	-5.5365E-04	-5.5944E-04	3.3388E-02	3.3388E-02	3.766E-02
CO-60	#B	-2.0564E-04	-2.0594E-04	1.2356E-03	1.2357E-03	1.949E-02
Sr-85	#A	6.7151E-03	7.0126E-03	2.7418E-02	2.7421E-02	3.044E-02
Kr-85	#A	1.5614E+02	1.5614E+02	6.0600E+02	6.0606E+02	7.023E+02
Y-88	#B	-2.3031E-05	-2.3647E-05	6.0769E-04	6.0769E-04	5.905E-02
NB-94	#B	-3.6095E-03	-3.6095E-03	3.4470E-02	3.4470E-02	4.187E-02
Ag-108M	#B	4.2850E-03	4.2853E-03	2.9716E-02	2.9717E-02	3.604E-02
CD-109	#A	6.1336E-01	6.1718E-01	1.5098E+00	1.5102E+00	1.660E+00
SN-113	#B	-8.6918E-03	-8.9067E-03	4.1342E-02	4.1345E-02	4.650E-02
SB-125	#B	8.8908E-03	8.9155E-03	4.8311E-02	4.8313E-02	5.962E-02
I-131	#B	-3.3198E-03	-4.7091E-03	3.3084E-02	3.3085E-02	2.759E-02
CS-134	#B	7.8853E-03	7.9148E-03	2.0529E-02	2.0534E-02	2.338E-02
CS-137	#A	1.4463E-03	1.4467E-03	2.5766E-02	2.5766E-02	3.241E-02
CE-139	#A	-5.6398E-03	-5.7562E-03	3.5284E-02	3.5286E-02	3.593E-02
EU-152	#B	-2.0480E-03	-2.0493E-03	4.7529E-01	4.7529E-01	1.139E-01
EU-154	#B	5.2680E-03	5.2728E-03	6.8026E-02	6.8026E-02	7.722E-02
EU-155	#B	6.9033E-02	6.9140E-02	1.8246E-01	1.8250E-01	2.020E-01

HG-203 #B	2.7847E-03	2.9579E-03	3.1562E-02	3.1562E-02	3.435E-02

TL-208	#	5.7120E-02	5.7120E-02	4.0499E-02	4.0626E-02	3.674E-02
PB-212	#	2.4015E-01	2.4015E-01	8.4277E-02	8.5347E-02	7.612E-02
PB-214	#	2.5667E-01	2.5667E-01	8.9217E-02	9.0373E-02	7.257E-02
BI-212	#B	-4.5307E-02	-4.5307E-02	2.7823E-01	2.7824E-01	3.306E-01
BI-214		2.4166E-01	2.4166E-01	1.1107E-01	1.1189E-01	
RA-224	#A	7.1869E-01	7.1869E-01	7.0646E-01	7.0761E-01	7.417E-01
RA-226	#A	3.0314E-01	3.0314E-01	8.7671E-01	8.7687E-01	9.818E-01
AC-228	#	2.2066E-01	2.2066E-01	1.1707E-01	1.1772E-01	1.397E-01
TH-227	#B	4.8292E-04	4.8292E-04	2.2573E-01	2.2573E-01	2.610E-01
PA-234	#B	-2.0071E-03	-2.0071E-03	1.5588E-01	1.5588E-01	1.767E-01
TH-234	#B	2.6585E-01	2.6585E-01	3.4197E+00	3.4197E+00	3.849E+00
AM-241	#A	-1.2672E-02	-1.2672E-02	5.2478E-01	5.2478E-01	5.918E-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 (295.7 to 1999.0 keV) 2.4166322E-01 pCi/gm
Total Decayed Activity (295.7 to 1999.0 keV) 2.4166322E-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_9AUG2006_1557.An1

Sample description
FSS-OOL-10-02-006-F

Spectrum Filename: C:\GammaVision\Spectra\102F_9AUG2006_1557.An1

Acquisition information

Start time:	09-Aug-2006 15:57:11
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:	1.5520E+03
Activity scaling factor:	1.0000E+06/(1.0000E+00* 1.5520E+03) = 6.4433E+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	04-Aug-2006 13:05:00
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. 9 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.3580

***** 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	96.	41.28	1.50	8.847E-03				
74.75	96.	41.28	1.50	8.847E-03	74.81	9.600	PBC<MDA	PB212
77.22	149.	27.10	1.50	9.541E-03	77.11	10.700	1.268E+00	PB214
					77.11	17.500	7.754E-01	PB212
77.22	149.	27.10	1.50	9.541E-03	77.11	10.700	1.268E+00	PB214
					77.11	17.500	7.754E-01	PB212
93.21	96.	40.10	1.50	1.333E-02	92.80	3.000	PBC<MDA	TH234
128.36	78.	38.25	1.17	1.712E-02				
186.31	100.	28.01	0.82	1.625E-02	185.99	3.280	1.566E+00	RA226
239.05	494.	5.56	1.22	1.379E-02	238.63	43.100	7.229E-01	PB212
					241.92	7.470	4.217E+00	PB214
242.70	63.	27.95	1.22	1.362E-02				
270.77	83.	30.22	1.28	1.241E-02				
277.91	43.	37.69	1.47	1.212E-02				
277.91	43.	37.69	1.47	1.212E-02	279.17	81.500	PBC<MDA	HG203
295.92	89.	19.08	1.39	1.144E-02	295.22	19.200	3.532E-01	PB214
328.63	44.	40.37	1.45	1.035E-02				
338.80	118.	17.17	1.10	1.005E-02	338.40	12.010	8.518E-01	AC228
352.56	219.	9.46	1.34	9.663E-03	351.99	37.100	5.301E-01	PB214
463.86	36.	30.47	1.50	7.365E-03	463.51	10.000	4.270E-01	SB125
511.93	88.	21.85	1.66	6.679E-03	510.72	22.500	5.081E-01	TL208
584.17	152.	11.77	1.61	5.880E-03	583.14	86.000	2.609E-01	TL208
610.45	128.	11.48	1.49	5.639E-03	609.32	46.090	4.270E-01	BI214
912.60	107.	15.50	1.14	3.916E-03	911.07	29.000	8.174E-01	AC228
969.60	67.	19.78	0.98	3.716E-03	968.90	17.460	9.022E-01	AC228
1121.92	51.	27.59	2.22	3.283E-03	1120.28	15.040	9.064E-01	BI214
1463.22	507.	4.44	1.95	2.617E-03	1460.75	10.700	1.574E+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
485.03	242.63	126.	63.	0.032	83.86	1.218	XE-138 lD
541.19	270.77	182.	83.	0.041	90.65	1.281	AC-228 M
656.93	328.63	102.	44.	0.022	121.12	1.455	LA-140 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	738.	149.	0.074	81.30	1.500D
PB-212	153.80	77.11	738.	149.	0.074	81.30	1.500D
TH-234	186.00	93.21	699.	96.	0.048	120.31	1.500
RA-226	371.87	186.13	292.	69.	0.035	103.46	1.500s
PB-212	477.68	239.03	352.	404.	0.202	24.73	1.500
PB-214	477.70	239.04	278.	353.	0.177	25.61	1.500
PB-214	591.29	295.82	117.	113.	0.056	49.48	1.500
AC-228	677.65	338.99	84.	111.	0.056	45.17	1.500
PB-214	704.88	352.60	78.	225.	0.113	25.94	1.500
SB-125	927.47	463.86	48.	36.	0.018	91.40	1.500s
TL-208	1022.31	511.27	67.	48.	0.024	84.58	1.499
TL-208	1168.35	584.26	35.	138.	0.069	31.17	1.499
BI-214	1220.76	610.45	32.	128.	0.064	34.44	1.488s
AC-228	1825.51	912.68	30.	80.	0.040	43.98	1.679
AC-228	1940.77	970.28	22.	42.	0.021	67.03	1.718
BI-214	2244.24	1121.92	42.	51.	0.026	82.78	2.217s
K-40	2927.38	1463.23	15.	473.	0.236	14.22	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		2.1973E-01					
			477.56	2.197E-01	%(	4.724E-01 1.43E-01	G
K-40		1.4679E+01					
			1460.75	1.468E+01	(P	6.426E-01 6.96E-01	G
MN-54		4.3353E-03					
			834.81	4.335E-03	&(P	5.507E-02 1.53E-02	G
CO-57		-2.2855E-02					
			122.07	-2.285E-02	%(	6.327E-02 1.91E-02	G K
			136.43	7.691E-02	&	4.101E-01 1.22E-01	G
CO-60		3.3801E-04					
			1332.51	3.380E-04	%(P	6.292E-02 1.66E-02	G K
			1173.23	-8.246E-03	%	9.168E-02 2.60E-02	G K
Sr-85		6.4120E-03					
			514.00	6.412E-03	&(	5.581E-02 1.61E-02	G
Kr-85		1.3124E+02					
			513.99	1.312E+02	&(	1.223E+03 3.52E+02	G
Y-88		1.0219E-03					
			1836.01	1.022E-03	%(P	5.703E-02 1.40E-02	G K
			898.02	-9.523E-03	& P	7.321E-02 2.05E-02	G
NB-94		-1.2146E-03					
			871.10	-1.215E-03	&(	7.416E-02 2.08E-02	G K
			702.50	-1.104E-02	&	6.585E-02 1.91E-02	G K
Ag-108M		-1.2108E-02					
			722.95	-1.211E-02	%(	7.643E-02 2.21E-02	G K
			614.37	-1.351E-02	% P	6.827E-02 1.99E-02	G
			433.93	1.994E-02	%	3.943E-02 1.20E-02	G
CD-109		2.0138E-01					
			88.04	2.014E-01	&(P	2.447E+00 7.30E-01	G
SN-113		-5.1852E-03					
			391.71	-5.185E-03	%(	7.824E-02 2.26E-02	G K
			255.04	-2.840E-03	&	2.170E+00 6.31E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	1.2066E-01						
		427.95	1.716E-02	&(P	1.486E-01	4.26E-02	G K
		600.77	1.321E-01	% P	2.428E-01	7.45E-02	G
		636.15	1.064E-01	% P	2.990E-01	8.80E-02	G
		463.51	4.270E-01	(P	4.159E-01	1.36E-01	G
		176.29	8.974E-02	% P	6.531E-01	1.93E-01	G
I-131	0.0000E+00						
		364.48	0.000E+00	%(	8.916E-02	2.56E-02	G K
		636.97	-7.418E-02	&	1.092E+00	3.07E-01	G
		284.29	-2.914E-01	%	1.096E+00	3.26E-01	G
CS-134	-3.2910E-03						
		604.66	-3.291E-03	%(	4.882E-02	1.37E-02	G K
		795.76	1.479E-02	%	6.903E-02	1.99E-02	G
		569.29	0.000E+00	%	4.142E-01	1.18E-01	G
		801.84	-6.779E-02	% P	7.084E-01	2.00E-01	G
CS-137	3.7673E-03						
		661.62	3.767E-03	%(	6.691E-02	1.89E-02	G
CE-139	1.2272E-02						
		165.85	1.227E-02	%(P	5.582E-02	1.66E-02	G
EU-152	-7.1085E-02						
		121.78	-7.109E-02	%(P	1.899E-01	5.72E-02	G K
		344.30	4.510E-03	%	1.452E-01	4.15E-02	G
		1408.08	3.952E-02	&	2.747E-01	7.50E-02	G
		964.00	6.333E-02	% P	4.369E-01	1.23E-01	G
		1112.07	2.295E-01	%	3.077E-01	1.02E-01	G
		778.90	-2.395E-02	% P	4.873E-01	1.37E-01	G
EU-154	6.0978E-04						
		123.10	6.098E-04	%(P	1.211E-01	3.57E-02	G K
		1274.80	5.588E-04	%	2.086E-01	5.65E-02	G
		723.30	-6.318E-02	% P	3.576E-01	1.04E-01	G
		1004.80	0.000E+00	&	4.952E-01	1.39E-01	G
EU-155	1.8992E-02						
		86.45	1.899E-02	%(P	2.898E-01	8.63E-02	G K
		105.31	6.758E-02	&	2.549E-01	7.64E-02	G
HG-203	-1.2164E-03						
		279.17	-1.216E-03	&(P	5.629E-02	1.63E-02	G K
		72.87	-4.243E-02	%	2.425E+00	7.22E-01	G
		70.83	-7.024E-01	%	4.755E+00	1.42E+00	G
		82.50	-5.292E-01	%	4.470E+00	1.33E+00	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	2.4574E-01						
		583.14	2.377E-01	(P	5.197E-02	2.48E-02	G
		510.72	2.766E-01	(	2.363E-01	7.80E-02	G
PB-212	5.9059E-01						
		238.63	5.906E-01	(	1.318E-01	4.87E-02	G K
							Energy duplication
		77.11	7.754E-01	+	6.741E-01	2.10E-01	G
		74.81	9.804E-01	% P	1.365E+00	4.18E-01	G
PB-214	5.4642E-01						
		351.99	5.464E-01	(P	1.063E-01	4.73E-02	G K
		295.22	4.469E-01	-	2.102E-01	7.37E-02	G
							Energy duplication
		77.11	1.268E+00	+	1.103E+00	3.44E-01	G
		241.92	3.015E+00	+	6.864E-01	2.57E-01	G
BI-212	3.0260E-01						
		727.17	3.026E-01	%(	5.020E-01	1.55E-01	G K
		1620.56	-4.432E-02	% P	2.168E+00	5.39E-01	G
		785.42	-3.462E-03	% P	3.062E+00	8.49E-01	G
BI-214	4.2704E-01						
		609.32	4.270E-01	*(	9.763E-02	4.91E-02	G K
		1764.51	-2.130E-03	& P	1.811E-01	2.46E-02	G
		1120.28	9.064E-01	+	5.778E-01	2.50E-01	G
RA-224	-2.2424E-02						
		241.00	-2.242E-02	&(P	1.591E+00	4.69E-01	G
RA-226	1.1330E+00						
		185.99	1.133E+00	*(P	1.344E+00	4.16E-01	G
AC-228	6.3542E-01						
		911.07	6.145E-01	(P	2.149E-01	9.04E-02	G K
		968.90	5.569E-01	(P	3.319E-01	1.25E-01	G
		338.40	8.001E-01	(	3.277E-01	1.20E-01	G
TH-227	-2.0306E-01						
		236.00	-2.031E-01	%(P	5.197E-01	1.57E-01	G K
		256.25	2.388E-04	&	6.698E-01	1.95E-01	G
PA-234	-1.9804E-03						
		98.44	-1.980E-03	%(	2.120E-01	6.24E-02	G K
		946.00	6.328E-02	%	3.039E-01	8.71E-02	G
		131.28	2.812E-03	%	2.667E-01	7.89E-02	G
		94.67	-1.563E-01	%	4.425E-01	1.33E-01	G
		883.24	9.296E-03	%	4.561E-01	1.24E-01	G
		926.70	2.585E-01	%	4.894E-01	1.50E-01	G

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 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26 0.000E+00 %   6.116E-01 1.74E-01 G

TH-234       1.5311E+00
                           63.29 1.095E+00 &(P 5.172E+00 1.55E+00 G K
                           92.80 2.098E+00  (  2.741E+00 8.42E-01 G
                           92.38 8.697E-01 & P 2.910E+00 8.74E-01 G

AM-241      -1.6282E-01
                           59.54-1.628E-01 %(  6.981E-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

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
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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	2.0560E-01	2.1973E-01	4.2911E-01	4.2929E-01	4.420E-01
K-40		1.4679E+01	1.4679E+01	2.0879E+00	2.2445E+00	6.426E-01
MN-54	#A	4.2863E-03	4.3353E-03	4.5805E-02	4.5805E-02	5.444E-02
CO-57	#B	-2.2556E-02	-2.2855E-02	5.7208E-02	5.7222E-02	6.245E-02
CO-60	#B	3.3738E-04	3.3801E-04	4.9718E-02	4.9718E-02	6.281E-02

Sr-85	#A	6.0705E-03	6.4120E-03	4.8220E-02	4.8221E-02	5.284E-02
Kr-85	#A	1.3123E+02	1.3124E+02	1.0553E+03	1.0553E+03	1.223E+03
Y-88	#B	9.8843E-04	1.0219E-03	4.1973E-02	4.1973E-02	5.517E-02
NB-94	#B	-1.2146E-03	-1.2146E-03	6.2439E-02	6.2439E-02	7.416E-02
Ag-108M	#B	-1.2107E-02	-1.2108E-02	6.6317E-02	6.6321E-02	7.642E-02
CD-109	#A	1.9981E-01	2.0138E-01	2.1887E+00	2.1887E+00	2.428E+00
SN-113	#B	-5.0278E-03	-5.1852E-03	6.7823E-02	6.7823E-02	7.587E-02
SB-125	#B	1.2024E-01	1.2066E-01	1.1503E-01	1.1522E-01	1.481E-01
I-131	#B	0.0000E+00	0.0000E+00	7.6781E-02	7.6781E-02	5.735E-02
CS-134	#B	-3.2756E-03	-3.2910E-03	4.1135E-02	4.1135E-02	4.859E-02
CS-137	#A	3.7661E-03	3.7673E-03	5.6653E-02	5.6653E-02	6.689E-02
CE-139	#A	1.1959E-02	1.2272E-02	4.9919E-02	4.9923E-02	5.440E-02
EU-152	#B	-7.1031E-02	-7.1085E-02	1.7933E-01	1.7937E-01	1.898E-01
EU-154	#B	6.0908E-04	6.0978E-04	1.0710E-01	1.0710E-01	1.209E-01
EU-155	#B	1.8955E-02	1.8992E-02	2.5877E-01	2.5877E-01	2.892E-01
HG-203	#B	-1.1272E-03	-1.2164E-03	5.6661E-02	5.6661E-02	5.216E-02
TL-208	#	2.4574E-01	2.4574E-01	7.6833E-02	7.8061E-02	5.197E-02
PB-212	#	5.9059E-01	5.9059E-01	1.4606E-01	1.4978E-01	1.318E-01
PB-214	#	5.4642E-01	5.4642E-01	1.4196E-01	1.4523E-01	1.063E-01
BI-212	#B	3.0260E-01	3.0260E-01	4.6641E-01	4.6671E-01	5.020E-01
BI-214	#	4.2704E-01	4.2704E-01	1.4707E-01	1.4901E-01	
RA-224	#A	-2.2424E-02	-2.2424E-02	1.6523E+01	1.6523E+01	1.591E+00
RA-226	#A	1.1330E+00	1.1330E+00	1.2475E+00	1.2491E+00	1.344E+00
AC-228		6.3542E-01	6.3542E-01	1.9513E-01	1.9836E-01	2.149E-01
TH-227	#B	-2.0306E-01	-2.0306E-01	4.7750E-01	4.7764E-01	5.197E-01
PA-234	#B	-1.9804E-03	-1.9804E-03	1.8720E-01	1.8720E-01	2.120E-01
TH-234	#B	1.5311E+00	1.5311E+00	1.8420E+00	1.8439E+00	5.172E+00
AM-241	#A	-1.6282E-01	-1.6282E-01	6.2666E-01	6.2672E-01	6.981E-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) 1.5741072E+01 pCi/gm
Total Decayed Activity (50.2 to 1999.0 keV) 1.5741072E+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_9AUG2006_1636.An1

Sample description
FSS-OOL-10-02-006-F-RC

Spectrum Filename: C:\GammaVision\Spectra\102F_9AUG2006_1636.An1

Acquisition information
Start time: 09-Aug-2006 16:37:02
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: 1.5520E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.5520E+03) =
6.4433E+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	04-Aug-2006 13:05:00
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. 9 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.7332

***** 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	118.	33.46	1.50	8.847E-03	74.81	9.600	PBC<MDA	PB212
77.17	169.	23.94	1.50	9.541E-03	77.11	10.700	1.439E+00	PB214
					77.11	17.500	8.801E-01	PB212
77.17	169.	23.94	1.50	9.541E-03	77.11	10.700	1.439E+00	PB214
					77.11	17.500	8.801E-01	PB212
90.21	75.	23.41	0.00	1.281E-02				
92.93	111.	34.49	1.50	1.333E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	2.423E+00	TH234
92.95	112.	34.33	1.50	1.325E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
186.46	94.	26.56	1.29	1.625E-02	185.99	3.280	1.453E+00	RA226
209.17	76.	37.99	1.21	1.520E-02				
239.11	479.	5.63	1.22	1.379E-02	238.63	43.100	7.011E-01	PB212
242.13	69.	25.82	1.22	1.365E-02	241.00	3.900	PBC<MDA	RA224
					241.92	7.470	5.886E-01	PB214
270.78	80.	31.57	1.63	1.241E-02				
295.88	132.	12.36	1.26	1.144E-02	295.22	19.200	5.235E-01	PB214
301.10	34.	39.39	1.26	1.126E-02				
338.83	139.	17.44	1.18	1.005E-02	338.40	12.010	1.002E+00	AC228
352.63	234.	12.68	1.35	9.661E-03	351.99	37.100	5.658E-01	PB214
463.23	62.	25.09	1.18	7.369E-03				
463.23	62.	25.09	1.18	7.369E-03	463.51	10.000	7.172E-01	SB125
511.07	77.	23.12	1.65	6.690E-03	510.72	22.500	4.474E-01	TL208
584.11	168.	10.99	1.55	5.881E-03	583.14	86.000	2.874E-01	TL208
610.29	144.	14.31	1.54	5.641E-03	609.32	46.090	4.809E-01	BI214
862.01	42.	28.44	1.56	4.117E-03				
912.41	100.	13.96	1.52	3.917E-03	911.07	29.000	7.676E-01	AC228

970.16	59.	29.96	1.36	3.714E-03				
1122.08	47.	32.56	2.53	3.283E-03	1120.28	15.040	8.288E-01	BI214
1463.29	555.	4.30	2.09	2.617E-03	1460.75	10.700	1.722E+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
417.95	209.17	274.	76.	0.038	113.97	1.207	AC-228 sM
477.84	239.00	124.	479.	0.240	16.88	1.215	PB-212 D
483.89	242.03	124.	69.	0.034	77.47	1.217	PB-214 D
541.21	270.78	186.	80.	0.040	79.73	1.629	AC-228 sM
601.87	301.07	70.	34.	0.017	118.17	1.259	PB-212 lD
926.22	463.23	82.	40.	0.020	106.86	1.176	AC-228 s
1724.11	862.01	29.	42.	0.021	85.31	1.556	TL-208 M
1940.52	970.16	67.	53.	0.026	78.06	1.360	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	149.62	75.02	758.	118.	0.059	100.38	1.500s
PB-214	153.80	77.11	732.	169.	0.084	71.83	1.500D
PB-212	153.80	77.11	732.	169.	0.084	71.83	1.500D
TH-234	185.48	92.95	695.	112.	0.056	102.99	1.500s
TH-234	185.44	92.93	682.	111.	0.056	103.48	1.500s
RA-226	372.45	186.42	304.	79.	0.040	93.60	1.500
PB-212	477.81	239.09	273.	455.	0.228	20.86	1.500
PB-214	591.29	295.82	128.	120.	0.060	48.53	1.500
AC-228	677.44	338.88	121.	126.	0.063	45.53	1.500
PB-214	704.65	352.48	123.	181.	0.091	34.07	1.500s
TL-208	1023.28	511.75	66.	51.	0.026	78.84	1.499s
TL-208	1168.38	584.27	41.	150.	0.075	30.38	1.499
BI-214	1220.43	610.29	68.	144.	0.072	42.93	1.542
AC-228	1825.80	912.83	17.	79.	0.040	40.14	1.679
BI-214	2244.56	1122.08	52.	47.	0.023	97.68	2.532s
K-40	2927.51	1463.30	23.	530.	0.265	13.56	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	MDA Value pCi/gm	COMMENTS
BE-7		-9.1741E-02					
			477.56	-9.174E-02	&(	5.477E-01 1.59E-01	G
K-40		1.6469E+01					
			1460.75	1.647E+01	(P	7.723E-01 7.45E-01	G
MN-54		-1.1344E-03					
			834.81	-1.134E-03	&(P	6.038E-02 1.66E-02	G
CO-57		2.6652E-02					
			122.07	2.665E-02	%(	5.474E-02 1.66E-02	G K
			136.43	-1.370E-02	&	3.659E-01 1.07E-01	G
CO-60		-1.1527E-04					
			1332.51	-1.153E-04	%(P	6.293E-02 1.65E-02	G K
			1173.23	1.163E-02	&	7.490E-02 2.12E-02	G K
Sr-85		-5.6048E-04					
			514.00	-5.605E-04	%(	6.075E-02 1.73E-02	G
Kr-85		-1.6874E+01					
			513.99	-1.687E+01	%(	1.302E+03 3.71E+02	G
Y-88		-3.9552E-04					
			1836.01	-3.955E-04	&(P	6.304E-02 1.57E-02	G K
			898.02	-1.463E-03	% P	7.386E-02 2.03E-02	G
NB-94		1.1534E-05					
			871.10	1.153E-05	%(	4.134E-02 1.08E-02	G K
			702.50	-8.010E-03	%	5.160E-02 1.47E-02	G K
Ag-108M		-1.3865E-02					
			722.95	-1.386E-02	%(	6.725E-02 1.95E-02	G K
			614.37	-4.500E-02	% P	8.841E-02 2.69E-02	G
			433.93	8.798E-04	%	4.720E-02 1.34E-02	G
CD-109		-1.1491E+00					
			88.04	-1.149E+00	%(P	2.311E+00 7.00E-01	G
SN-113		6.1024E-03					
			391.71	6.102E-03	%(	7.616E-02 2.20E-02	G K
			255.04	4.684E-01	%	2.169E+00 6.43E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	1.9225E-02						
		427.95	1.922E-02	%(P	1.422E-01	4.08E-02	G K
		600.77	-5.343E-02	% P	2.848E-01	8.22E-02	G
		636.15	1.634E-01	& P	4.214E-01	1.26E-01	G
		463.51	2.416E-01	% P	5.127E-01	1.55E-01	G
		176.29	1.113E-01	& P	7.050E-01	2.09E-01	G
I-131	-2.5008E-02						
		364.48	-2.501E-02	&(	9.415E-02	2.79E-02	G K
		636.97	2.724E-01	&	1.081E+00	3.15E-01	G
		284.29	-5.521E-02	%	1.218E+00	3.56E-01	G
CS-134	-8.7307E-03						
		604.66	-8.731E-03	%(	5.144E-02	1.48E-02	G K
		795.76	2.041E-02	%	5.954E-02	1.76E-02	G
		569.29	-1.446E-02	&	2.807E-01	7.83E-02	G
		801.84	1.421E-01	& P	5.508E-01	1.59E-01	G
CS-137	-4.2179E-03						
		661.62	-4.218E-03	%(	7.303E-02	2.07E-02	G
CE-139	1.1569E-02						
		165.85	1.157E-02	&(P	5.581E-02	1.66E-02	G
EU-152	7.4314E-02						
		121.78	7.431E-02	%(P	1.690E-01	5.11E-02	G K
		344.30	-2.979E-02	%	1.824E-01	5.36E-02	G
		1408.08	-1.570E-02	%	3.469E-01	9.40E-02	G
		964.00	-2.876E-02	% P	6.201E-01	1.76E-01	G
		1112.07	-3.862E-03	%	5.085E-01	1.39E-01	G
		778.90	-4.694E-02	% P	4.913E-01	1.39E-01	G
EU-154	-3.9315E-02						
		123.10	-3.931E-02	&(P	1.366E-01	4.10E-02	G K
		1274.80	-2.328E-02	%	2.401E-01	6.75E-02	G
		723.30	-7.216E-02	% P	3.113E-01	9.03E-02	G
		1004.80	8.441E-02	%	3.888E-01	1.12E-01	G
EU-155	9.8094E-04						
		86.45	9.809E-04	%(P	3.063E-01	9.10E-02	G K
		105.31	-7.791E-02	%	2.694E-01	8.09E-02	G
HG-203	1.5919E-02						
		279.17	1.592E-02	&(P	5.870E-02	1.75E-02	G K
		72.87	-6.024E-01	%	2.579E+00	7.75E-01	G
		70.83	-2.204E+00	&	4.474E+00	1.36E+00	G
		82.50	-6.746E-01	&	4.924E+00	1.47E+00	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	2.6600E-01						
		583.14	2.577E-01	(P	5.602E-02	2.62E-02	G
		510.72	2.976E-01	*(	2.342E-01	7.82E-02	G
PB-212	6.6598E-01						
		238.63	6.660E-01	(	1.167E-01	4.63E-02	G K
							Energy duplication
		77.11	8.801E-01	+	6.717E-01	2.11E-01	G
		74.81	1.206E+00	& P	1.343E+00	4.14E-01	G
PB-214	4.5160E-01						
		351.99	4.398E-01	@(P	1.317E-01	5.01E-02	G K
		295.22	4.744E-01	(	2.194E-01	7.67E-02	G
							Energy duplication
		77.11	1.439E+00	+	1.099E+00	3.45E-01	G
		241.92	2.841E-01	%	7.947E-01	2.39E-01	G
BI-212	1.6983E-02						
		727.17	1.698E-02	&(	7.058E-01	2.02E-01	G K
		1620.56	-2.051E-01	% P	2.152E+00	5.53E-01	G
		785.42	-5.162E-01	% P	3.096E+00	8.88E-01	G
BI-214	4.8088E-01						
		609.32	4.809E-01	(	1.378E-01	6.89E-02	G K
		1764.51	-2.951E-02	& P	4.398E-01	1.16E-01	G
		1120.28	8.288E-01	+	6.404E-01	2.70E-01	G
RA-224	6.9100E-01						
		241.00	6.910E-01	%(P	1.477E+00	4.47E-01	G
RA-226	1.2937E+00						
		185.99	1.294E+00	(P	1.370E+00	4.26E-01	G
AC-228	6.0682E-01						
		911.07	6.068E-01	(P	1.681E-01	8.14E-02	G K
		968.90	8.790E-02	% P	4.713E-01	1.36E-01	G
		338.40	9.102E-01	+	3.883E-01	1.38E-01	G
TH-227	-2.6144E-01						
		236.00	-2.614E-01	%(P	5.588E-01	1.69E-01	G K
		256.25	-1.487E-02	%	6.506E-01	1.90E-01	G
PA-234	3.5088E-02						
		98.44	3.509E-02	%(	2.898E-01	8.65E-02	G K
		946.00	2.696E-03	%	3.290E-01	9.06E-02	G
		131.28	-3.280E-02	%	2.163E-01	6.42E-02	G
		94.67	-1.856E-01	%	5.586E-01	1.68E-01	G
		883.24	-2.278E-02	%	4.838E-01	1.34E-01	G
		926.70	-6.603E-03	%	4.958E-01	1.34E-01	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26-1.775E-02 &   4.137E-01 1.15E-01 G

TH-234       1.8574E+00
                           63.29 7.648E-01 &(P 5.230E+00 1.56E+00 G K
                           92.80 2.423E+00 *(  2.708E+00 8.36E-01 G
                           92.38 2.855E+00 *(P 3.210E+00 9.90E-01 G

AM-241      -1.4730E-02
                           59.54-1.473E-02 &(  8.034E-01 2.38E-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:                      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	-8.5812E-02	-9.1741E-02	4.7850E-01	4.7853E-01	5.123E-01
K-40		1.6469E+01	1.6469E+01	2.2346E+00	2.4182E+00	7.723E-01
MN-54	#A	-1.1215E-03	-1.1344E-03	1.1381E-01	1.1381E-01	5.970E-02
CO-57	#B	2.6302E-02	2.6652E-02	4.9826E-02	4.9848E-02	5.402E-02
CO-60	#B	-1.1506E-04	-1.1527E-04	1.4168E-01	1.4168E-01	6.282E-02

Sr-85	#A	-5.3048E-04	-5.6048E-04	5.1936E-02	5.1936E-02	5.749E-02
Kr-85	#A	-1.6874E+01	-1.6874E+01	1.1126E+03	1.1126E+03	1.302E+03
Y-88	#B	-3.8250E-04	-3.9552E-04	5.4203E-02	5.4203E-02	6.096E-02
NB-94	#B	1.1534E-05	1.1534E-05	3.2372E-02	3.2372E-02	4.134E-02
Ag-108M	#B	-1.3864E-02	-1.3865E-02	5.8471E-02	5.8476E-02	6.724E-02
CD-109	#A	-1.1401E+00	-1.1491E+00	2.2052E+00	2.2061E+00	2.293E+00
SN-113	#B	5.9162E-03	6.1024E-03	6.6048E-02	6.6049E-02	7.384E-02
SB-125	#B	1.9157E-02	1.9225E-02	1.2249E-01	1.2250E-01	1.417E-01
I-131	#B	-1.6045E-02	-2.5008E-02	8.3746E-02	8.3758E-02	6.041E-02
CS-134	#B	-8.6894E-03	-8.7307E-03	4.4368E-02	4.4371E-02	5.120E-02
CS-137	#A	-4.2165E-03	-4.2179E-03	6.2233E-02	6.2233E-02	7.300E-02
CE-139	#A	1.1273E-02	1.1569E-02	4.9867E-02	4.9871E-02	5.438E-02
EU-152	#B	7.4257E-02	7.4314E-02	1.5330E-01	1.5335E-01	1.688E-01
EU-154	#B	-3.9270E-02	-3.9315E-02	1.2464E-01	1.2466E-01	1.364E-01
EU-155	#B	9.7901E-04	9.8094E-04	2.7314E-01	2.7314E-01	3.057E-01
HG-203	#B	1.4745E-02	1.5919E-02	5.2403E-02	5.2411E-02	5.438E-02
TL-208	#	2.6600E-01	2.6600E-01	8.1024E-02	8.2387E-02	5.602E-02
PB-212	#	6.6598E-01	6.6598E-01	1.3894E-01	1.4388E-01	1.167E-01
PB-214	#	4.5160E-01	4.5160E-01	1.3398E-01	1.3635E-01	1.317E-01
BI-212	#B	1.6983E-02	1.6983E-02	6.0659E-01	6.0659E-01	7.058E-01
BI-214		4.8088E-01	4.8088E-01	2.0643E-01	2.0819E-01	
RA-224	#A	6.9100E-01	6.9100E-01	1.3421E+00	1.3426E+00	1.477E+00
RA-226	#A	1.2937E+00	1.2937E+00	1.2790E+00	1.2810E+00	1.370E+00
AC-228		6.0682E-01	6.0682E-01	2.4429E-01	2.4665E-01	1.681E-01
TH-227	#B	-2.6144E-01	-2.6144E-01	5.1408E-01	5.1429E-01	5.588E-01
PA-234	#B	3.5088E-02	3.5088E-02	2.5936E-01	2.5936E-01	2.898E-01
TH-234	#B	1.8574E+00	1.8574E+00	1.9221E+00	1.9249E+00	5.230E+00
AM-241	#A	-1.4730E-02	-1.4730E-02	7.1501E-01	7.1501E-01	8.034E-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) 1.7556995E+01 pCi/gm
Total Decayed Activity (270.7 to 1999.0 keV) 1.7556995E+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_9AUG2006_1714.An1

Sample description
FSS-OOL-10-02-012-F

Spectrum Filename: C:\GammaVision\Spectra\102F_9AUG2006_1714.An1

Acquisition information
Start time: 09-Aug-2006 17:14:37
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: 1.8540E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.8540E+03) =
5.3937E+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	04-Aug-2006 16:00:00
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. 11 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.7364

***** 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
74.54	107.	27.19	1.10	8.817E-03				
74.54	107.	27.19	1.10	8.817E-03	74.81	9.600	PBC<MDA	PB212
77.48	210.	14.32	1.10	9.698E-03	77.11	10.700	1.496E+00	PB214
					77.11	17.500	9.149E-01	PB212
209.96	81.	37.18	0.68	1.516E-02				
239.08	617.	4.79	1.22	1.378E-02	238.63	43.100	7.559E-01	PB212
242.70	59.	31.24	1.22	1.362E-02	241.00	3.900	PBC<MDA	RA224
					241.92	7.470	4.224E-01	PB214
269.97	90.	27.14	1.08	1.244E-02				
277.75	72.	34.34	0.94	1.213E-02				
295.74	115.	20.23	1.06	1.145E-02	295.22	19.200	3.801E-01	PB214
339.35	143.	16.48	1.22	1.003E-02	338.40	12.010	8.609E-01	AC228
352.54	213.	11.00	1.50	9.664E-03	351.99	37.100	4.316E-01	PB214
463.77	68.	25.30	1.47	7.361E-03	463.51	10.000	6.600E-01	SB125
512.07	109.	17.30	1.52	6.678E-03	510.72	22.500	5.274E-01	TL208
584.21	180.	13.05	1.44	5.880E-03	583.14	86.000	2.584E-01	TL208
610.25	144.	10.89	1.60	5.641E-03	609.32	46.090	4.020E-01	BI214
728.38	55.	30.73	1.27	4.787E-03	727.17	11.800	7.074E-01	BI212
912.89	129.	11.17	1.34	3.915E-03				
970.86	86.	19.70	1.04	3.711E-03				
1463.35	546.	4.33	1.88	2.617E-03	1460.75	10.700	1.419E+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

148.65	74.71	368.	107.	0.053	81.56	1.098	BI-207	D
154.53	77.65	345.	210.	0.105	42.96	1.100	PB-214	D
419.54	209.96	306.	81.	0.041	111.55	0.681	NP-239	sM
477.79	239.07	128.	617.	0.309	14.36	1.215	PB-212	D
485.02	242.68	141.	59.	0.030	93.72	1.218	XE-138	D

Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM	Suspected	
539.57	269.97	182.	90.	0.045	81.42	1.084	AC-228	sM
555.15	277.75	186.	70.	0.035	90.16	0.939	NP-239	sM
1825.92	912.89	23.	131.	0.066	30.41	1.341	AC-228	M
1941.92	970.86	43.	93.	0.046	43.28	1.040	J-135	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	833.	195.	0.097	66.44	1.500D
PB-212	153.80	77.11	833.	195.	0.097	66.44	1.500D
PB-212	477.79	239.08	319.	567.	0.284	18.36	1.500
PB-214	591.39	295.87	172.	106.	0.053	59.93	1.500
AC-228	677.56	338.94	133.	103.	0.052	55.79	1.500
PB-214	704.96	352.64	106.	189.	0.094	31.70	1.500
SB-125	926.80	463.52	73.	42.	0.021	94.28	1.500s
TL-208	1023.91	512.07	77.	109.	0.054	51.89	1.520s
TL-208	1168.26	584.21	93.	180.	0.090	39.16	1.441
BI-214	1220.35	610.25	37.	144.	0.072	32.67	1.596s
BI-212	1457.43	728.74	36.	35.	0.017	89.06	1.554s
K-40	2927.59	1463.34	5.	531.	0.265	13.13	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		1.0751E-01					
			477.56	1.075E-01	%(	4.546E-01	1.34E-01 G
K-40		1.3797E+01					
			1460.75	1.380E+01	(P	3.278E-01	6.04E-01 G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
MN-54	-1.2160E-02						
		834.81	-1.216E-02	&(P	6.048E-02	1.75E-02	G
CO-57	-9.7811E-03						
		122.07	-9.781E-03	%(	5.895E-02	1.76E-02	G K
		136.43	-6.702E-02	%	4.730E-01	1.41E-01	G
CO-60	8.4457E-03						
		1332.51	8.446E-03	%(P	6.425E-02	1.80E-02	G K
		1173.23	0.000E+00	&	8.869E-02	2.50E-02	G K
Sr-85	1.3616E-02						
		514.00	1.362E-02	&(	5.264E-02	1.55E-02	G
Kr-85	2.9768E+02						
		513.99	2.977E+02	&(	1.151E+03	3.40E+02	G
Y-88	-2.3159E-05						
		1836.01	-2.316E-05	%(P	2.601E-02	3.53E-03	G K
		898.02	2.456E-02	& P	5.333E-02	1.61E-02	G
NB-94	-2.9637E-03						
		871.10	-2.964E-03	&(	5.499E-02	1.54E-02	G K
		702.50	1.391E-02	&	4.363E-02	1.29E-02	G K
Ag-108M	1.7858E-02						
		722.95	1.786E-02	&(	3.848E-02	1.17E-02	G K
		614.37	-2.623E-02	& P	7.092E-02	2.12E-02	G
		433.93	0.000E+00	&	4.672E-02	1.33E-02	G
CD-109	2.0251E-01						
		88.04	2.025E-01	%(P	2.265E+00	6.77E-01	G
SN-113	0.0000E+00						
		391.71	0.000E+00	&(	7.008E-02	2.02E-02	G K
		255.04	9.923E-02	&	1.995E+00	5.85E-01	G
SB-125	9.2036E-02						
		427.95	-1.766E-02	%(P	1.410E-01	4.06E-02	G K
		600.77	9.275E-02	& P	2.203E-01	6.61E-02	G
		636.15	8.971E-02	& P	3.757E-01	1.09E-01	G
		463.51	4.167E-01	*(P	4.230E-01	1.36E-01	G
		176.29	-3.205E-02	& P	6.827E-01	2.01E-01	G
I-131	0.0000E+00						
		364.48	0.000E+00	%(	8.165E-02	2.36E-02	G K
		636.97	1.881E-01	&	8.809E-01	2.55E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
		284.29	1.711E-01	%	9.886E-01	2.92E-01	G
CS-134	-1.0277E-02						
		604.66	-1.028E-02	%(	4.971E-02	1.45E-02	G K
		795.76	2.630E-02	%	5.387E-02	1.64E-02	G
		569.29	8.139E-02	&	2.476E-01	7.32E-02	G
		801.84	-8.176E-02	& P	6.492E-01	1.85E-01	G
CS-137	1.5180E-02						
		661.62	1.518E-02	%(	6.540E-02	1.92E-02	G
CE-139	-6.1121E-03						
		165.85	-6.112E-03	%(P	5.603E-02	1.66E-02	G
EU-152	-2.3981E-02						
		121.78	-2.398E-02	%(P	1.730E-01	5.16E-02	G K
		344.30	-3.604E-02	%	1.683E-01	4.98E-02	G
		1408.08	-2.992E-02	%	2.869E-01	7.90E-02	G
		964.00	-1.721E-02	& P	4.233E-01	1.18E-01	G
		1112.07	1.582E-02	%	4.921E-01	1.37E-01	G
		778.90	-7.975E-02	& P	4.429E-01	1.28E-01	G
EU-154	7.6757E-03						
		123.10	7.676E-03	%(P	1.241E-01	3.69E-02	G K
		1274.80	-3.833E-02	%	2.208E-01	6.34E-02	G
		723.30	-2.381E-02	& P	2.780E-01	7.89E-02	G
		1004.80	-3.713E-02	%	3.595E-01	1.02E-01	G
EU-155	-3.1402E-03						
		86.45	-3.140E-03	%(P	2.834E-01	8.44E-02	G K
		105.31	2.383E-02	%	2.570E-01	7.65E-02	G
HG-203	1.3586E-03						
		279.17	1.359E-03	&(P	4.608E-02	1.34E-02	G K
		72.87	-3.175E-02	&	2.507E+00	7.49E-01	G
		70.83	-5.058E-01	%	4.040E+00	1.21E+00	G
		82.50	-1.025E+00	&	4.417E+00	1.33E+00	G
TL-208	2.5843E-01						
		583.14	2.584E-01	(P	6.871E-02	3.39E-02	G
		510.72	5.274E-01	+	2.110E-01	9.15E-02	G
PB-212	6.9483E-01						
		238.63	6.948E-01	(	1.053E-01	4.25E-02	G K
							Energy duplication
		77.11	8.500E-01	+	5.988E-01	1.88E-01	G
		74.81	8.609E-01	& P	1.192E+00	3.65E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
PB-214	3.7231E-01						
		351.99	3.832E-01	(P	1.027E-01	4.06E-02	G K
		295.22	3.513E-01	(	2.111E-01	7.02E-02	G
							Energy duplication
		77.11	1.390E+00	+	9.794E-01	3.08E-01	G
		241.92	3.363E-01	%	6.664E-01	2.02E-01	G
BI-212	4.5055E-01						
		727.17	4.505E-01	(	3.972E-01	1.34E-01	G K
		1620.56	-3.131E-01	% P	2.017E+00	5.42E-01	G
		785.42	1.130E+00	% P	2.419E+00	7.33E-01	G
BI-214	4.0199E-01						
		609.32	4.020E-01	@(	8.736E-02	4.38E-02	G K
		1764.51	-1.783E-03	% P	1.516E-01	2.06E-02	G
		1120.28	-4.123E-02	%	5.350E-01	1.52E-01	G
RA-224	6.8189E-01						
		241.00	6.819E-01	&(P	1.261E+00	3.83E-01	G
RA-226	8.0594E-01						
		185.99	8.059E-01	%(P	1.348E+00	4.10E-01	G
AC-228	1.7054E-01						
		911.07	-1.675E-02	%(P	2.735E-01	7.82E-02	G K
		968.90	-7.209E-02	% P	4.254E-01	1.23E-01	G
		338.40	6.228E-01	(	3.402E-01	1.16E-01	G
TH-227	-2.1357E-02						
		236.00	-2.136E-02	%(P	3.229E-01	9.46E-02	G K
		256.25	5.177E-02	&	5.926E-01	1.74E-01	G
PA-234	-6.5418E-02						
		98.44	-6.542E-02	%(	2.657E-01	7.98E-02	G K
		946.00	6.628E-04	%	2.630E-01	7.20E-02	G
		131.28	-4.347E-02	&	2.515E-01	7.52E-02	G
		94.67	-8.259E-02	%	3.806E-01	1.14E-01	G
		883.24	2.353E-02	%	3.932E-01	1.09E-01	G
		926.70	5.509E-02	&	4.555E-01	1.28E-01	G
		569.26	1.202E-01	&	3.657E-01	1.08E-01	G
TH-234	-2.9611E-01						
		63.29	-2.961E-01	%(P	4.666E+00	1.39E+00	G K
		92.80	1.397E+00	&	2.536E+00	7.71E-01	G
		92.38	1.619E+00	& P	3.007E+00	9.14E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
AM-241	-2.4471E-02						
		59.54	-2.447E-02	&(	6.597E-01	1.96E-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	

- -

***** 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	1.0069E-01	1.0751E-01	4.0075E-01	4.0080E-01	4.257E-01
K-40		1.3797E+01	1.3797E+01	1.8115E+00	1.9700E+00	3.278E-01
MN-54	#A	-1.2024E-02	-1.2160E-02	5.5753E-02	5.5757E-02	5.981E-02
CO-57	#B	-9.6550E-03	-9.7811E-03	5.2836E-02	5.2839E-02	5.819E-02
CO-60	#B	8.4303E-03	8.4457E-03	5.3936E-02	5.3938E-02	6.413E-02
Sr-85	#A	1.2900E-02	1.3616E-02	4.6607E-02	4.6613E-02	4.987E-02
Kr-85	#A	2.9767E+02	2.9768E+02	1.0194E+03	1.0196E+03	1.151E+03
Y-88	#B	-2.2410E-05	-2.3159E-05	1.3895E-04	1.3896E-04	2.517E-02
NB-94	#B	-2.9637E-03	-2.9637E-03	4.6179E-02	4.6180E-02	5.499E-02
Ag-108M	#B	1.7857E-02	1.7858E-02	3.4986E-02	3.5000E-02	3.848E-02
CD-109	#A	2.0095E-01	2.0251E-01	2.0298E+00	2.0298E+00	2.248E+00

SN-113	#B	0.0000E+00	0.0000E+00	6.0481E-02	6.0481E-02	6.798E-02
SB-125	#B	9.1718E-02	9.2036E-02	8.9966E-02	9.0114E-02	1.405E-01
I-131	#B	0.0000E+00	0.0000E+00	7.0679E-02	7.0679E-02	5.282E-02
CS-134	#B	-1.0229E-02	-1.0277E-02	4.3428E-02	4.3432E-02	4.948E-02
CS-137	#A	1.5176E-02	1.5180E-02	5.7473E-02	5.7479E-02	6.538E-02
CE-139	#A	-5.9584E-03	-6.1121E-03	5.4010E-02	5.4011E-02	5.462E-02
EU-152	#B	-2.3963E-02	-2.3981E-02	1.7251E-01	1.7252E-01	1.729E-01
EU-154	#B	7.6670E-03	7.6757E-03	1.1066E-01	1.1066E-01	1.239E-01
EU-155	#B	-3.1341E-03	-3.1402E-03	6.5445E-01	6.5445E-01	2.829E-01
HG-203	#B	1.2603E-03	1.3586E-03	4.0095E-02	4.0095E-02	4.274E-02
TL-208		2.5843E-01	2.5843E-01	1.0142E-01	1.0245E-01	
PB-212	#	6.9483E-01	6.9483E-01	1.2759E-01	1.3341E-01	1.053E-01
PB-214	#	3.7231E-01	3.7231E-01	1.1826E-01	1.2009E-01	1.027E-01
BI-212	#	4.5055E-01	4.5055E-01	4.0128E-01	4.0207E-01	3.972E-01
BI-214	#	4.0199E-01	4.0199E-01	1.3134E-01	1.3326E-01	
RA-224	#A	6.8189E-01	6.8189E-01	1.1501E+00	1.1508E+00	1.261E+00
RA-226	#A	8.0593E-01	8.0594E-01	1.2311E+00	1.2320E+00	1.348E+00
AC-228	B	1.7054E-01	1.7054E-01	9.5152E-02	9.5632E-02	2.735E-01
TH-227	#B	-2.1357E-02	-2.1357E-02	3.2148E-01	3.2148E-01	3.229E-01
PA-234	#B	-6.5418E-02	-6.5418E-02	2.3942E-01	2.3945E-01	2.657E-01
TH-234	#B	-2.9611E-01	-2.9611E-01	4.5402E+00	4.5402E+00	4.666E+00
AM-241	#A	-2.4470E-02	-2.4471E-02	5.8743E-01	5.8744E-01	6.597E-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 1999.0 keV) 1.4628123E+01 pCi/gm
Total Decayed Activity (269.7 to 1999.0 keV) 1.4628123E+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_9AUG2006_1752.An1

Sample description
FSS-OOL-10-02-016-F

Spectrum Filename: C:\GammaVision\Spectra\102F_9AUG2006_1752.An1

Acquisition information
Start time: 09-Aug-2006 17:52:11
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: 1.6550E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.6550E+03) =
6.0423E+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	04-Aug-2006 10:40:00
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. 12 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.8723

***** 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
77.11	129.	31.47	1.50	9.541E-03	77.11	10.700	PBC<MDA	PB214
					77.11	17.500	6.327E-01	PB212
77.11	129.	31.47	1.50	9.541E-03	77.11	10.700	1.035E+00	PB214
					77.11	17.500	6.327E-01	PB212
87.36	75.	35.96	1.11	1.224E-02	86.45	32.740	PBC<MDA	EU155
					88.04	3.790	PBC<MDA	CD109
89.78	77.	32.04	1.11	1.276E-02				
89.78	77.	32.04	1.11	1.276E-02	92.38	2.570	PBC<MDA	TH234
93.14	108.	24.15	1.11	1.343E-02	92.80	3.000	2.198E+00	TH234
					94.67	15.500	4.146E-01	PA234
239.10	610.	5.92	1.09	1.378E-02	238.63	43.100	8.371E-01	PB212
					241.92	7.470	4.883E+00	PB214
270.62	84.	24.92	1.45	1.241E-02				
295.76	100.	20.37	1.38	1.145E-02	295.22	19.200	3.709E-01	PB214
338.99	125.	17.16	1.08	1.004E-02	338.40	12.010	8.475E-01	AC228
352.57	203.	11.23	1.32	9.663E-03	351.99	37.100	4.616E-01	PB214
464.23	46.	29.99	0.79	7.354E-03	463.51	10.000	4.902E-01	SB125
511.46	80.	20.47	1.90	6.685E-03	510.72	22.500	4.342E-01	TL208
584.44	172.	11.71	1.71	5.877E-03	583.14	86.000	2.766E-01	TL208
610.42	130.	13.12	1.47	5.640E-03	609.32	46.090	4.092E-01	BI214
795.78	26.	33.89	1.60	4.420E-03	795.76	85.400	PBC<MDA	CS134
912.72	113.	13.07	1.52	3.916E-03	911.07	29.000	8.096E-01	AC228
968.91	96.	14.39	1.03	3.718E-03				
970.60	49.	21.44	1.72	3.718E-03	968.90	17.460	6.126E-01	AC228
1334.77	16.	37.89	1.96	2.834E-03	1332.51	99.980	PBC<MDA	CO60
1463.29	487.	4.53	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	
174.30	87.55	323.	75.	0.037	107.89	1.107	PB-214	lD
179.14	89.97	269.	77.	0.039	96.13	1.109	PB-214	lD
185.87	93.34	284.	108.	0.054	72.45	1.111	U-235	lD
477.83	239.10	696.	146.	0.073	80.50	1.086	PB-212	M
540.89	270.62	133.	84.	0.042	74.76	1.450	AC-228	sM
1938.03	968.91	76.	48.	0.024	88.89	1.030	AC-228	sM
2927.48	1463.29	-1.	488.	0.244	13.53	1.754	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	764.	129.	0.065	94.40	1.500D
PB-212	153.80	77.11	764.	129.	0.065	94.40	1.500D
PB-212	477.63	239.00	289.	440.	0.220	21.75	1.500
PB-214	477.68	239.02	161.	458.	0.229	18.30	1.500s
PB-214	591.25	295.80	121.	117.	0.058	48.70	1.500
AC-228	677.67	339.00	116.	98.	0.049	55.52	1.500
PB-214	704.95	352.63	94.	177.	0.089	32.27	1.500s
SB-125	927.84	464.04	62.	33.	0.017	107.26	1.500s
TL-208	1022.70	511.46	61.	80.	0.040	61.42	1.903s
TL-208	1168.71	584.44	65.	172.	0.086	35.14	1.707
BI-214	1220.69	610.42	52.	130.	0.065	39.37	1.466
CS-134	1591.58	795.78	27.	26.	0.013	101.68	1.601s
AC-228	1825.90	912.88	23.	102.	0.051	35.64	1.679
AC-228	1941.41	970.60	30.	49.	0.024	64.32	1.718
CO-60	2670.24	1334.77	11.	16.	0.008	113.68	1.959s

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	%(	5.092E-01 1.45E-01	G
K-40		-4.6631E-02					
			1460.75	-4.663E-02	%(P	9.538E-01 2.67E-01	G
MN-54		-3.8148E-03					
			834.81	-3.815E-03	%(P	5.363E-02 1.48E-02	G
CO-57		0.0000E+00					
			122.07	0.000E+00	%(	5.658E-02 1.67E-02	G K
			136.43	8.481E-02	%	4.395E-01 1.31E-01	G
CO-60		4.6722E-02					
			1332.51	4.672E-02	?(P	5.230E-02 1.78E-02	G K
			1173.23	1.273E-02	%	7.323E-02 2.09E-02	G K
Sr-85		-1.7097E-02					
			514.00	-1.710E-02	%(	6.215E-02 1.84E-02	G
Kr-85		-3.7296E+02					
			513.99	-3.730E+02	%(	1.356E+03 4.01E+02	G
Y-88		-2.5985E-05					
			1836.01	-2.599E-05	&(P	2.918E-02 3.96E-03	G K
			898.02	-1.036E-02	& P	6.897E-02 1.94E-02	G
NB-94		-8.5806E-03					
			871.10	-8.581E-03	%(	5.855E-02 1.66E-02	G K
			702.50	0.000E+00	%	6.590E-02 1.86E-02	G K
Ag-108M		1.1186E-03					
			722.95	1.119E-03	&(	5.725E-02 1.59E-02	G K
			614.37	-3.030E-02	% P	7.697E-02 2.31E-02	G
			433.93	-8.316E-03	%	4.919E-02 1.43E-02	G
CD-109		-4.4845E-02					
			88.04	-4.485E-02	%(P	2.388E+00 7.10E-01	G
SN-113		-6.1222E-03					
			391.71	-6.122E-03	%(	7.616E-02 2.21E-02	G K
			255.04	0.000E+00	%	2.217E+00 6.47E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	1.1821E-01						
		427.95	3.240E-02	%(P	1.350E-01	3.94E-02	G K
		600.77	-5.216E-02	% P	2.734E-01	7.90E-02	G
		636.15	-8.408E-02	& P	4.462E-01	1.29E-01	G
		463.51	3.722E-01	(P	4.395E-01	1.39E-01	G
		176.29	-1.171E-01	& P	7.172E-01	2.12E-01	G
I-131	1.2489E-03						
		364.48	1.249E-03	%(	6.939E-02	1.97E-02	G K
		636.97	-2.430E-01	&	1.086E+00	3.15E-01	G
		284.29	1.032E-01	&	1.029E+00	3.01E-01	G
CS-134	2.8212E-02						
		604.66	2.560E-03	&(	3.989E-02	1.11E-02	G K
		795.76	5.753E-02	(	5.852E-02	1.95E-02	G
		569.29	8.306E-02	%	2.965E-01	8.71E-02	G
		801.84	3.115E-02	& P	6.134E-01	1.70E-01	G
CS-137	9.0873E-04						
		661.62	9.087E-04	%(	5.947E-02	1.66E-02	G
CE-139	3.2378E-03						
		165.85	3.238E-03	&(P	5.513E-02	1.63E-02	G
EU-152	-4.9978E-03						
		121.78	-4.998E-03	%(P	1.679E-01	4.96E-02	G K
		344.30	-1.828E-04	&	1.761E-01	5.09E-02	G
		1408.08	0.000E+00	&	3.075E-01	8.16E-02	G
		964.00	-8.583E-02	& P	5.179E-01	1.49E-01	G
		1112.07	-5.655E-02	%	5.666E-01	1.60E-01	G
		778.90	-3.598E-02	% P	3.814E-01	1.06E-01	G
EU-154	-1.6889E-02						
		123.10	-1.689E-02	&(P	1.205E-01	3.59E-02	G K
		1274.80	1.674E-02	%	1.974E-01	5.47E-02	G
		723.30	-5.835E-02	% P	3.270E-01	9.46E-02	G
		1004.80	8.905E-03	&	3.643E-01	1.01E-01	G
EU-155	-7.9561E-03						
		86.45	-7.956E-03	%(P	3.022E-01	8.98E-02	G K
		105.31	-9.428E-03	%	2.609E-01	7.73E-02	G
HG-203	-1.1857E-03						
		279.17	-1.186E-03	%(P	5.488E-02	1.59E-02	G K
		72.87	-2.795E-01	%	2.026E+00	6.05E-01	G
		70.83	1.852E-01	%	4.034E+00	1.20E+00	G
		82.50	1.182E+00	&	4.181E+00	1.26E+00	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	2.7660E-01						
		583.14	2.766E-01	(P	6.512E-02	3.25E-02	G
		510.72	4.342E-01	+	2.118E-01	8.90E-02	G
PB-212	6.1262E-01						
		238.63	6.045E-01	(	1.125E-01	4.38E-02	G K
							Energy duplication
		77.11	6.327E-01	(	6.432E-01	1.99E-01	G
		74.81	6.576E-01	& P	1.318E+00	4.00E-01	G
PB-214	4.1305E-01						
		351.99	4.029E-01	@(P	1.089E-01	4.34E-02	G K
		295.22	4.327E-01	(	2.002E-01	7.02E-02	G
							Energy duplication
		77.11	1.035E+00	+	1.052E+00	3.26E-01	G
		241.92	3.663E+00	+	4.949E-01	2.23E-01	G
BI-212	-6.5760E-04						
		727.17	-6.576E-04	%(	4.603E-01	1.28E-01	G K
		1620.56	-2.397E-01	% P	1.869E+00	4.80E-01	G
		785.42	-7.533E-03	% P	2.009E+00	5.34E-01	G
BI-214	4.0924E-01						
		609.32	4.092E-01	(	1.144E-01	5.38E-02	G K
		1764.51	-1.997E-03	% P	3.865E-01	9.79E-02	G
		1120.28	-2.136E-02	&	7.364E-01	2.11E-01	G
RA-224	3.4012E-01						
		241.00	3.401E-01	&(P	1.347E+00	4.02E-01	G
RA-226	6.8529E-01						
		185.99	6.853E-01	%(P	1.344E+00	4.07E-01	G
AC-228	6.8336E-01						
		911.07	7.341E-01	(P	1.802E-01	8.74E-02	G K
		968.90	6.126E-01	(P	3.565E-01	1.31E-01	G
		338.40	6.635E-01	(	3.575E-01	1.23E-01	G
TH-227	-2.1558E-01						
		236.00	-2.156E-01	%(P	5.039E-01	1.52E-01	G K
		256.25	1.023E-01	&	6.357E-01	1.88E-01	G
PA-234	-5.1206E-02						
		98.44	-5.121E-02	%(	2.485E-01	7.43E-02	G K
		946.00	1.153E-01	%	2.531E-01	7.66E-02	G
		131.28	6.609E-04	&	2.426E-01	7.17E-02	G
		94.67	1.666E-03	%	4.536E-01	1.35E-01	G
		883.24	1.007E-01	%	3.894E-01	1.12E-01	G
		926.70	3.547E-03	&	5.281E-01	1.45E-01	G

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 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26 1.226E-01 %   4.378E-01 1.29E-01 G

TH-234       1.0020E+00
                           63.29 1.002E+00 %(P 4.905E+00 1.47E+00 G K
                           92.80 1.865E+00 %   2.562E+00 7.85E-01 G
                           92.38 5.675E-01 % P 2.765E+00 8.27E-01 G

AM-241       2.3463E-02
                           59.54 2.346E-02 %(  7.083E-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	0.0000E+00	0.0000E+00	4.3434E-01	4.3434E-01	4.754E-01
K-40	#A	-4.6631E-02	-4.6631E-02	9.6916E-01	9.6917E-01	9.538E-01
MN-54	#A	-3.7702E-03	-3.8148E-03	5.5422E-02	5.5423E-02	5.300E-02
CO-57	#B	0.0000E+00	0.0000E+00	5.0097E-02	5.0097E-02	5.582E-02
CO-60	#B	4.6633E-02	4.6722E-02	5.3368E-02	5.3432E-02	5.220E-02

Sr-85	#A	-1.6155E-02	-1.7097E-02	5.5210E-02	5.5218E-02	5.873E-02
Kr-85	#A	-3.7295E+02	-3.7296E+02	1.2044E+03	1.2046E+03	1.356E+03
Y-88	#B	-2.5105E-05	-2.5985E-05	1.5591E-04	1.5592E-04	2.819E-02
NB-94	#B	-8.5806E-03	-8.5806E-03	4.9937E-02	4.9939E-02	5.855E-02
Ag-108M	#B	1.1185E-03	1.1186E-03	4.7701E-02	4.7701E-02	5.725E-02
CD-109	#A	-4.4483E-02	-4.4845E-02	8.0692E+00	8.0692E+00	2.368E+00
SN-113	#B	-5.9298E-03	-6.1222E-03	6.6246E-02	6.6247E-02	7.377E-02
SB-125	#B	1.1778E-01	1.1821E-01	1.3265E-01	1.3281E-01	1.345E-01
I-131	#B	7.9085E-04	1.2489E-03	5.9145E-02	5.9145E-02	4.394E-02
CS-134	#B	2.8074E-02	2.8212E-02	2.8685E-02	2.8729E-02	3.970E-02
CS-137	#A	9.0843E-04	9.0873E-04	4.9740E-02	4.9740E-02	5.945E-02
CE-139	#A	3.1524E-03	3.2378E-03	4.8845E-02	4.8846E-02	5.368E-02
EU-152	#B	-4.9939E-03	-4.9978E-03	2.7142E-01	2.7142E-01	1.678E-01
EU-154	#B	-1.6869E-02	-1.6889E-02	1.1073E-01	1.1073E-01	1.203E-01
EU-155	#B	-7.9400E-03	-7.9561E-03	2.0569E+00	2.0569E+00	3.016E-01
HG-203	#B	-1.0958E-03	-1.1857E-03	5.5043E-02	5.5043E-02	5.071E-02
TL-208		2.7660E-01	2.7660E-01	9.7441E-02	9.8670E-02	
PB-212	#	6.1262E-01	6.1262E-01	1.3322E-01	1.3758E-01	1.125E-01
PB-214	#	4.1305E-01	4.1305E-01	1.2073E-01	1.2293E-01	1.089E-01
BI-212	#B	-6.5760E-04	-6.5760E-04	3.8358E-01	3.8358E-01	4.603E-01
BI-214		4.0924E-01	4.0924E-01	1.6111E-01	1.6273E-01	
RA-224	#A	3.4012E-01	3.4012E-01	1.2075E+00	1.2076E+00	1.347E+00
RA-226	#A	6.8529E-01	6.8529E-01	1.2215E+00	1.2221E+00	1.344E+00
AC-228		6.8336E-01	6.8336E-01	2.1002E-01	2.1349E-01	1.802E-01
TH-227	#B	-2.1558E-01	-2.1558E-01	4.6325E-01	4.6341E-01	5.039E-01
PA-234	#B	-5.1206E-02	-5.1206E-02	2.2296E-01	2.2298E-01	2.485E-01
TH-234	#B	1.0020E+00	1.0020E+00	4.4031E+00	4.4034E+00	4.905E+00
AM-241	#A	2.3462E-02	2.3463E-02	6.2993E-01	6.2993E-01	7.083E-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) 1.3692052E+00 pCi/gm
Total Decayed Activity (50.2 to 1999.0 keV) 1.3692052E+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_9AUG2006_1829.An1

Sample description
FSS-OOL-10-02-019-F

Spectrum Filename: C:\GammaVision\Spectra\102F_9AUG2006_1829.An1

Acquisition information
Start time: 09-Aug-2006 18:29:30
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: 1.3640E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.3640E+03) =
7.3314E+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_9AUG2006_1829.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	04-Aug-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. 11 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.5382

***** 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
77.23	108.	34.33	1.50	9.541E-03	77.11	10.700	PBC<MDA	PB214
					77.11	17.500	6.407E-01	PB212
77.23	108.	34.33	1.50	9.541E-03	77.11	10.700	1.048E+00	PB214
					77.11	17.500	6.407E-01	PB212
186.16	59.	32.99	1.68	1.626E-02	185.99	3.280	PBC<MDA	RA226
239.21	541.	6.32	1.19	1.378E-02	238.63	43.100	9.012E-01	PB212
270.61	69.	22.57	1.77	1.241E-02				
295.82	93.	13.58	1.26	1.145E-02	295.22	19.200	4.180E-01	PB214
301.15	35.	32.63	1.26	1.126E-02				
338.87	79.	22.83	1.35	1.005E-02	338.40	12.010	6.494E-01	AC228
352.51	171.	12.80	1.49	9.665E-03	351.99	37.100	4.713E-01	PB214
511.48	96.	14.79	2.20	6.685E-03	510.72	22.500	6.314E-01	TL208
584.17	127.	12.04	1.50	5.880E-03	583.14	86.000	2.472E-01	TL208
610.61	140.	10.72	1.38	5.638E-03	609.32	46.090	5.312E-01	BI214
912.58	95.	15.48	1.51	3.916E-03	911.07	29.000	8.220E-01	AC228
969.85	82.	15.25	1.20	3.715E-03	968.90	17.460	1.254E+00	AC228
1463.27	357.	5.29	1.75	2.617E-03	1460.75	10.700	1.261E+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	
478.04	239.21	601.	125.	0.062	87.58	1.193	PB-212	M
540.87	270.61	73.	69.	0.035	67.71	1.766	AC-228	sM
601.72	301.03	92.	52.	0.026	101.06	1.067	PB-212	M
1939.91	969.85	65.	38.	0.019	102.01	1.196	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	633.	108.	0.054	102.99	1.500D
PB-212	153.80	77.11	633.	108.	0.054	102.99	1.500D
RA-226	372.48	186.44	219.	59.	0.029	105.51	1.500s
PB-212	477.79	239.08	220.	362.	0.181	23.46	1.500
PB-214	591.28	295.81	72.	90.	0.045	51.13	1.500
AC-228	677.62	338.97	90.	74.	0.037	64.37	1.500
PB-214	705.03	352.67	67.	130.	0.065	37.23	1.500
TL-208	1022.73	511.48	33.	96.	0.048	44.37	2.202s
TL-208	1168.18	584.17	32.	126.	0.063	36.11	1.497
BI-214	1221.08	610.61	26.	140.	0.070	32.17	1.382s
AC-228	1825.89	912.87	22.	75.	0.038	43.46	1.679
AC-228	1941.32	970.55	30.	44.	0.022	69.72	1.718
K-40	2927.51	1463.30	7.	336.	0.168	16.72	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		6.7088E-02					
			477.56	6.709E-02	&(	3.876E-01 1.10E-01 G	
K-40		1.1854E+01					
			1460.75	1.185E+01	(P	5.426E-01 6.61E-01 G	
MN-54		-1.0541E-02					
			834.81	-1.054E-02	&(P	6.890E-02 1.95E-02 G	
CO-57		7.4231E-04					
			122.07	7.423E-04	%(	5.930E-02 1.74E-02 G K	
			136.43	1.379E-01	&	4.566E-01 1.37E-01 G	

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CO-60	-2.7250E-04						
		1332.51	-2.725E-04	%(P	4.274E-02	9.99E-03	G K
		1173.23	1.522E-02	%	7.542E-02	2.14E-02	G K
Sr-85	-1.2883E-02						
		514.00	-1.288E-02	%(	6.608E-02	1.93E-02	G
Kr-85	-2.7996E+02						
		513.99	-2.800E+02	%(	1.441E+03	4.21E+02	G
Y-88	-9.7215E-03						
		1836.01	-9.721E-03	%(P	7.409E-02	1.97E-02	G K
		898.02	1.459E-02	& P	6.284E-02	1.78E-02	G
NB-94	8.8244E-03						
		871.10	8.824E-03	%(	4.926E-02	1.38E-02	G K
		702.50	1.489E-03	%	5.373E-02	1.48E-02	G K
Ag-108M	-1.3529E-02						
		722.95	-1.353E-02	%(	6.588E-02	1.90E-02	G K
		614.37	-4.017E-02	& P	9.240E-02	2.78E-02	G
		433.93	-5.185E-03	%	4.958E-02	1.42E-02	G
CD-109	3.8058E-02						
		88.04	3.806E-02	%(P	2.663E+00	7.91E-01	G
SN-113	2.5813E-03						
		391.71	2.581E-03	&(	7.297E-02	2.08E-02	G K
		255.04	-5.667E-01	&	2.343E+00	6.96E-01	G
SB-125	3.0914E-02						
		427.95	3.091E-02	%(P	1.534E-01	4.44E-02	G K
		600.77	-1.318E-03	& P	3.010E-01	8.35E-02	G
		636.15	-4.902E-02	& P	4.940E-01	1.39E-01	G
		463.51	2.613E-01	% P	4.979E-01	1.51E-01	G
		176.29	-2.331E-02	% P	5.911E-01	1.70E-01	G
I-131	0.0000E+00						
		364.48	0.000E+00	%(	7.550E-02	2.12E-02	G K
		636.97	0.000E+00	&	1.292E+00	3.59E-01	G
		284.29	3.891E-04	%	1.199E+00	3.46E-01	G
CS-134	5.9645E-03						
		604.66	5.965E-03	%(	3.776E-02	1.05E-02	G K
		795.76	3.183E-02	%	7.144E-02	2.16E-02	G
		569.29	4.392E-02	%	3.200E-01	9.09E-02	G
		801.84	-2.777E-02	& P	6.874E-01	1.89E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CS-137	-4.8190E-03						
		661.62	-4.819E-03	%(	6.860E-02	1.93E-02	G
CE-139	-9.7878E-04						
		165.85	-9.788E-04	%(P	5.593E-02	1.64E-02	G
EU-152	-4.6710E-03						
		121.78	-4.671E-03	&(P	1.605E-01	4.70E-02	G K
		344.30	-7.085E-02	%	1.904E-01	5.71E-02	G
		1408.08	5.908E-02	%	2.935E-01	8.14E-02	G
		964.00	-1.430E-01	% P	5.874E-01	1.70E-01	G
		1112.07	-3.071E-02	&	4.953E-01	1.35E-01	G
		778.90	1.212E-02	% P	4.579E-01	1.26E-01	G
EU-154	1.3223E-02						
		123.10	1.322E-02	&(P	1.190E-01	3.52E-02	G K
		1274.80	4.583E-02	%	1.870E-01	5.32E-02	G
		723.30	3.056E-02	% P	2.841E-01	7.95E-02	G
		1004.80	3.588E-04	&	2.960E-01	7.70E-02	G
EU-155	-4.9848E-02						
		86.45	-4.985E-02	%(P	3.103E-01	9.24E-02	G K
		105.31	9.911E-02	%	2.713E-01	8.17E-02	G
HG-203	-7.1815E-03						
		279.17	-7.182E-03	%(P	6.883E-02	2.02E-02	G K
		72.87	-4.288E-01	%	2.130E+00	6.37E-01	G
		70.83	-1.245E+00	%	4.955E+00	1.49E+00	G
		82.50	-9.000E-01	%	5.174E+00	1.55E+00	G
TL-208	2.4721E-01						
		583.14	2.472E-01	(P	5.654E-02	2.99E-02	G
		510.72	6.314E-01	+	1.939E-01	9.35E-02	G
PB-212	6.1386E-01						
		238.63	6.030E-01	(	1.195E-01	4.71E-02	G K
							Energy duplication
		77.11	6.407E-01	(	7.117E-01	2.20E-01	G
		74.81	7.876E-01	& P	1.429E+00	4.34E-01	G
PB-214	3.7484E-01						
		351.99	3.599E-01	(P	1.125E-01	4.48E-02	G K
		295.22	4.038E-01	(	1.902E-01	6.88E-02	G
							Energy duplication
		77.11	1.048E+00	+	1.164E+00	3.60E-01	G
		241.92	4.907E-01	%	7.531E-01	2.31E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
BI-212	-5.1131E-02						
		727.17	-5.113E-02	&(	5.457E-01	1.54E-01	G K
		1620.56	-5.043E-02	% P	1.108E+00	1.50E-01	G
		785.42	3.117E-01	% P	2.542E+00	7.05E-01	G
BI-214	5.3118E-01						
		609.32	5.312E-01	@(	1.014E-01	5.71E-02	G K
		1764.51	-7.490E-02	% P	5.244E-01	1.43E-01	G
		1120.28	-5.217E-02	&	5.597E-01	1.57E-01	G
RA-224	9.8559E-01						
		241.00	9.856E-01	&(P	1.434E+00	4.41E-01	G
RA-226	1.0872E+00						
		185.99	1.087E+00	*(P	1.329E+00	4.12E-01	G
AC-228	6.5053E-01						
		911.07	6.548E-01	(P	2.148E-01	9.52E-02	G K
		968.90	6.725E-01	(P	4.341E-01	1.56E-01	G
		338.40	6.084E-01	(	3.840E-01	1.31E-01	G
TH-227	-7.5386E-02						
		236.00	-7.539E-02	%(P	4.949E-01	1.46E-01	G K
		256.25	1.349E-03	%	6.398E-01	1.85E-01	G
PA-234	-7.1993E-02						
		98.44	-7.199E-02	%(	2.969E-01	8.90E-02	G K
		946.00	-3.682E-02	%	3.416E-01	9.55E-02	G
		131.28	1.272E-02	&	2.603E-01	7.69E-02	G
		94.67	4.026E-02	%	5.424E-01	1.61E-01	G
		883.24	3.332E-02	&	5.266E-01	1.45E-01	G
		926.70	-9.606E-02	%	5.870E-01	1.66E-01	G
		569.26	6.485E-02	%	4.724E-01	1.34E-01	G
TH-234	-6.2104E-02						
		63.29	-6.210E-02	&(P	5.305E+00	1.57E+00	G K
		92.80	1.251E+00	%	2.927E+00	8.86E-01	G
		92.38	-1.495E-01	% P	3.453E+00	1.02E+00	G
AM-241	7.7214E-02						
		59.54	7.721E-02	%(	7.965E-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	6.2612E-02	6.7088E-02	3.3078E-01	3.3080E-01	3.618E-01
K-40		1.1854E+01	1.1854E+01	1.9832E+00	2.0918E+00	5.426E-01
MN-54	#A	-1.0417E-02	-1.0541E-02	6.4444E-02	6.4447E-02	6.809E-02
CO-57	#B	7.3224E-04	7.4231E-04	5.2315E-02	5.2315E-02	5.850E-02
CO-60	#B	-2.7197E-04	-2.7250E-04	4.6643E-03	4.6643E-03	4.266E-02
Sr-85	#A	-1.2170E-02	-1.2883E-02	5.7860E-02	5.7865E-02	6.243E-02
Kr-85	#A	-2.7995E+02	-2.7996E+02	1.2618E+03	1.2619E+03	1.441E+03
Y-88	#B	-9.3910E-03	-9.7215E-03	5.9607E-02	5.9610E-02	7.157E-02
NB-94	#B	8.8244E-03	8.8244E-03	4.1264E-02	4.1267E-02	4.926E-02
Ag-108M	#B	-1.3528E-02	-1.3529E-02	5.6862E-02	5.6867E-02	6.588E-02
CD-109	#A	3.7749E-02	3.8058E-02	2.3724E+00	2.3724E+00	2.642E+00
SN-113	#B	2.4999E-03	2.5813E-03	6.2259E-02	6.2259E-02	7.067E-02
SB-125	#B	3.0802E-02	3.0914E-02	1.3313E-01	1.3314E-01	1.528E-01
I-131	#B	0.0000E+00	0.0000E+00	6.3651E-02	6.3651E-02	4.773E-02
CS-134	#B	5.9354E-03	5.9645E-03	3.1517E-02	3.1519E-02	3.757E-02
CS-137	#A	-4.8174E-03	-4.8190E-03	5.7780E-02	5.7781E-02	6.858E-02
CE-139	#A	-9.5289E-04	-9.7878E-04	9.8263E-02	9.8263E-02	5.445E-02
EU-152	#B	-4.6673E-03	-4.6710E-03	3.1309E-01	3.1309E-01	1.603E-01
EU-154	#B	1.3208E-02	1.3223E-02	1.0559E-01	1.0559E-01	1.189E-01
EU-155	#B	-4.9747E-02	-4.9848E-02	4.1027E-01	4.1028E-01	3.097E-01

HG-203 #B	-6.6351E-03	-7.1815E-03	6.2264E-02	6.2265E-02	6.359E-02

TL-208		2.4721E-01	2.4721E-01	8.9543E-02	9.0611E-02	
PB-212	#	6.1386E-01	6.1386E-01	1.4399E-01	1.4805E-01	1.195E-01
PB-214	#	3.7484E-01	3.7484E-01	1.1866E-01	1.2051E-01	1.125E-01
BI-212	#B	-5.1131E-02	-5.1131E-02	4.6243E-01	4.6244E-01	5.457E-01
BI-214	#	5.3118E-01	5.3118E-01	1.7087E-01	1.7345E-01	
RA-224	#A	9.8559E-01	9.8559E-01	1.3221E+00	1.3233E+00	1.434E+00
RA-226	#A	1.0872E+00	1.0872E+00	1.2346E+00	1.2361E+00	1.329E+00
AC-228		6.5053E-01	6.5053E-01	2.2653E-01	2.2945E-01	2.148E-01
TH-227	#B	-7.5386E-02	-7.5386E-02	4.6108E-01	4.6110E-01	4.949E-01
PA-234	#B	-7.1993E-02	-7.1993E-02	2.6691E-01	2.6694E-01	2.969E-01
TH-234	#B	-6.2104E-02	-6.2104E-02	8.3645E+00	8.3645E+00	5.305E+00
AM-241	#A	7.7212E-02	7.7214E-02	7.0961E-01	7.0963E-01	7.965E-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) 1.3283025E+01 pCi/gm
Total Decayed Activity (50.2 to 1999.0 keV) 1.3283025E+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_9AUG2006_1906.An1

Sample description
FSS-OOL-10-02-009-F

Spectrum Filename: C:\GammaVision\Spectra\102F_9AUG2006_1906.An1

Acquisition information
Start time: 09-Aug-2006 19:06:49
Live time: 2000
Real time: 2023
Dead time: 1.14 %
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: 1.9570E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.9570E+03) =
5.1099E+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	07-Aug-2006 11:30:00
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. 14 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.8090

***** 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	135.	35.65	1.50	8.847E-03	74.81	9.600	PBC<MDA	PB212
77.16	245.	19.69	1.50	9.541E-03	77.11	17.500	1.014E+00	PB212
					77.11	10.700	1.658E+00	PB214
77.16	245.	19.69	1.50	9.541E-03	77.11	17.500	PBC<MDA	PB212
					77.11	10.700	1.658E+00	PB214
92.99	114.	40.17	1.31	1.337E-02	92.80	3.000	1.961E+00	TH234
186.39	119.	27.96	1.32	1.625E-02	185.99	3.280	1.480E+00	RA226
208.40	131.	26.45	1.39	1.523E-02				
239.11	762.	4.32	1.22	1.378E-02	238.63	43.100	8.841E-01	PB212
242.19	109.	20.47	1.22	1.364E-02	241.00	3.900	PBC<MDA	RA224
					241.92	7.470	7.348E-01	PB214
270.38	79.	36.60	1.32	1.242E-02				
295.81	234.	8.80	1.26	1.145E-02	295.22	19.200	7.356E-01	PB214
328.81	61.	34.52	1.69	1.035E-02				
339.25	139.	16.31	1.26	1.004E-02	338.40	12.010	7.944E-01	AC228
352.58	371.	9.02	0.93	9.663E-03	351.99	37.100	7.127E-01	PB214
463.31	30.	41.07	1.50	7.365E-03	463.51	10.000	PBC<MDA	SB125
511.79	116.	19.52	1.58	6.681E-03	510.72	22.500	5.336E-01	TL208
584.37	218.	8.53	1.45	5.878E-03	583.14	86.000	2.972E-01	TL208
610.46	280.	7.29	1.48	5.639E-03	609.32	46.090	7.439E-01	BI214
728.43	63.	22.84	1.80	4.787E-03	727.17	11.800	7.690E-01	BI212
796.39	24.	34.21	1.53	4.416E-03	795.76	85.400	4.419E-02	CS134
913.01	185.	8.74	1.63	3.915E-03				
968.79	119.	13.47	1.83	3.718E-03				
1122.33	82.	17.72	1.80	3.278E-03	1120.28	15.040	1.154E+00	BI214
1463.34	491.	4.61	2.13	2.617E-03	1460.75	10.700	1.208E+01	K40
1767.63	34.	20.92	2.24	2.225E-03	1764.51	15.920	6.541E-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
416.41	208.40	413.	131.	0.066	79.36	1.395	LU-177 sM
477.84	239.09	160.	762.	0.381	12.96	1.215	PB-212 D
484.00	242.17	192.	109.	0.054	61.40	1.217	PB-214 D
540.40	270.38	272.	79.	0.040	109.80	1.322	AC-228 sM
657.30	328.81	153.	61.	0.031	103.57	1.687	LA-140 sM
1826.16	913.01	30.	182.	0.091	25.67	1.632	AC-228 M
1937.79	968.79	54.	106.	0.053	41.38	1.826	AC-228 sM
2245.07	1122.33	26.	64.	0.032	50.07	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	149.48	74.95	1147.	135.	0.068	106.96	1.500s
PB-212	153.80	77.11	1042.	245.	0.123	59.08	1.500D
PB-214	153.80	77.11	1042.	245.	0.123	59.08	1.500D
TH-234	185.77	93.10	1032.	133.	0.067	105.52	1.500
RA-226	372.10	186.25	527.	117.	0.058	84.61	1.500s
PB-212	477.81	239.09	473.	698.	0.349	17.42	1.500
PB-214	591.21	295.78	184.	245.	0.122	30.34	1.500
AC-228	677.75	339.04	190.	130.	0.065	52.09	1.500
PB-214	705.06	352.69	95.	305.	0.152	21.88	1.500
TL-208	1023.37	511.79	118.	116.	0.058	58.56	1.575s
TL-208	1168.58	584.37	48.	218.	0.109	25.58	1.449
BI-214	1220.77	610.46	48.	280.	0.140	21.87	1.479
BI-212	1456.81	728.43	48.	63.	0.032	68.51	1.800
CS-134	1592.85	796.41	32.	24.	0.012	117.62	1.601
BI-214	2240.95	1120.28	33.	61.	0.031	55.05	1.819D
K-40	2927.64	1463.36	10.	477.	0.239	14.02	2.042
BI-214	3536.73	1767.63	8.	34.	0.017	62.75	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		3.9589E-02					
			477.56	3.959E-02	&(	3.937E-01 1.13E-01	G
K-40		1.1757E+01					
			1460.75	1.176E+01	(P	4.383E-01 5.50E-01	G
MN-54		-5.0215E-04					
			834.81	-5.022E-04	&(P	6.433E-02 1.82E-02	G
CO-57		-1.7104E-02					
			122.07	-1.710E-02	%(	6.313E-02 1.90E-02	G K
			136.43	1.021E-01	%	4.685E-01 1.40E-01	G
CO-60		-6.5071E-04					
			1332.51	-6.507E-04	&(P	5.421E-02 1.45E-02	G K
			1173.23	1.034E-03	%	6.873E-02 1.91E-02	G K
Sr-85		-1.1251E-02					
			514.00	-1.125E-02	%(	5.901E-02 1.74E-02	G
Kr-85		-2.7595E+02					
			513.99	-2.760E+02	%(	1.348E+03 3.98E+02	G
Y-88		3.5100E-03					
			1836.01	3.510E-03	%(P	4.751E-02 1.22E-02	G K
			898.02	-3.072E-03	& P	5.859E-02 1.62E-02	G
NB-94		-8.4512E-03					
			871.10	-8.451E-03	%(	5.564E-02 1.59E-02	G K
			702.50	-4.834E-03	%	5.803E-02 1.67E-02	G K
Ag-108M		0.0000E+00					
			722.95	0.000E+00	&(	7.157E-02 2.04E-02	G K
			614.37	-4.811E-02	% P	7.579E-02 2.33E-02	G
			433.93	-1.151E-02	%	4.894E-02 1.44E-02	G
CD-109		7.2586E-02					
			88.04	7.259E-02	%(P	2.475E+00 7.40E-01	G
SN-113		-6.6599E-03					
			391.71	-6.660E-03	%(	6.529E-02 1.90E-02	G K
			255.04	-2.023E-01	&	2.154E+00 6.36E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	-4.4844E-02						
		427.95	-4.484E-02	&(P	1.684E-01	4.98E-02	G K
		600.77	-6.006E-02	& P	3.072E-01	8.99E-02	G
		636.15	-7.790E-04	% P	5.154E-01	1.47E-01	G
		463.51	2.846E-01	% P	3.947E-01	1.23E-01	G
		176.29	-1.027E-01	& P	7.321E-01	2.18E-01	G
I-131	7.6788E-03						
		364.48	7.679E-03	&(	5.528E-02	1.61E-02	G K
		636.97	1.456E-01	%	7.374E-01	2.14E-01	G
		284.29	-2.040E-01	&	8.735E-01	2.60E-01	G
CS-134	2.8746E-02						
		604.66	1.561E-02	%(	4.280E-02	1.28E-02	G K
		795.76	4.375E-02	(	5.318E-02	1.72E-02	G
		569.29	7.921E-03	%	3.653E-01	1.05E-01	G
		801.84	2.185E-01	% P	5.042E-01	1.52E-01	G
CS-137	7.3143E-03						
		661.62	7.314E-03	%(	4.456E-02	1.27E-02	G
CE-139	-1.0172E-02						
		165.85	-1.017E-02	%(P	5.712E-02	1.71E-02	G
EU-152	-4.9005E-02						
		121.78	-4.900E-02	%(P	1.805E-01	5.42E-02	G K
		344.30	-5.586E-02	%	1.676E-01	5.02E-02	G
		1408.08	-1.313E-03	&	2.916E-01	7.87E-02	G
		964.00	-1.836E-02	& P	5.842E-01	1.67E-01	G
		1112.07	6.086E-02	%	4.911E-01	1.40E-01	G
		778.90	2.345E-02	& P	2.900E-01	8.00E-02	G
EU-154	-3.4311E-02						
		123.10	-3.431E-02	&(P	1.275E-01	3.83E-02	G K
		1274.80	3.036E-03	%	1.972E-01	5.46E-02	G
		723.30	-9.608E-04	& P	2.120E-01	5.82E-02	G
		1004.80	8.539E-02	&	2.603E-01	7.64E-02	G
EU-155	1.7809E-01						
		86.45	1.781E-01	%(P	2.756E-01	8.40E-02	G K
		105.31	4.989E-02	%	2.736E-01	8.20E-02	G
HG-203	2.1262E-02						
		279.17	2.126E-02	%(P	5.229E-02	1.58E-02	G K
		72.87	8.007E-02	%	1.944E+00	5.80E-01	G
		70.83	3.473E-03	%	3.803E+00	1.13E+00	G
		82.50	-1.121E+00	&	4.119E+00	1.24E+00	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	2.9717E-01						
		583.14	2.972E-01	(P	4.771E-02	2.54E-02	G
		510.72	5.336E-01	+	2.441E-01	1.04E-01	G
PB-212	8.1026E-01						
		238.63	8.103E-01	(	1.208E-01	4.71E-02	G K
							Energy duplication
		77.11	1.014E+00	+	6.333E-01	2.00E-01	G
		74.81	1.099E+00	& P	1.305E+00	4.01E-01	G
PB-214	5.8585E-01						
		351.99	5.859E-01	(P	9.273E-02	4.28E-02	G K
		295.22	7.672E-01	+	2.066E-01	7.76E-02	G
							Energy duplication
		77.11	1.658E+00	+	1.036E+00	3.26E-01	G
		241.92	3.200E-01	%	7.616E-01	2.30E-01	G
BI-212	7.6901E-01						
		727.17	7.690E-01	(	4.272E-01	1.76E-01	G K
		1620.56	-3.515E-02	% P	2.294E+00	6.04E-01	G
		785.42	1.059E+00	% P	2.860E+00	8.54E-01	G
BI-214	7.4750E-01						
		609.32	7.439E-01	(	9.236E-02	5.43E-02	G K
		1764.51	6.541E-01	&(P	3.102E-01	1.37E-01	G
		1120.28	8.574E-01	(	4.102E-01	1.57E-01	G
RA-224	6.6426E-01						
		241.00	6.643E-01	&(P	1.433E+00	4.34E-01	G
RA-226	1.5097E+00						
		185.99	1.510E+00	@(P	1.420E+00	4.42E-01	G
AC-228	2.3194E-01						
		911.07	2.032E-02	%(P	2.272E-01	6.48E-02	G K
		968.90	1.540E-01	% P	4.060E-01	1.21E-01	G
		338.40	7.429E-01	(	3.823E-01	1.29E-01	G
TH-227	-2.0409E-01						
		236.00	-2.041E-01	%(P	5.401E-01	1.63E-01	G K
		256.25	1.193E-01	%	6.350E-01	1.89E-01	G
PA-234	-6.7074E-02						
		98.44	-6.707E-02	&(	2.390E-01	7.19E-02	G K
		946.00	-3.733E-02	%	2.478E-01	7.02E-02	G
		131.28	1.486E-01	&	2.279E-01	6.97E-02	G
		94.67	-1.288E-01	&	5.176E-01	1.56E-01	G
		883.24	3.725E-02	%	2.962E-01	8.15E-02	G
		926.70	-4.462E-02	&	5.127E-01	1.45E-01	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26 1.173E-02 %   5.408E-01 1.55E-01 G

TH-234       1.9327E+00
                           63.29 1.650E+00 %(P 5.017E+00 1.51E+00 G K
                           92.80 2.300E+00  (  2.631E+00 8.09E-01 G
                           92.38-1.926E-01 % P 3.136E+00 9.36E-01 G

AM-241       3.9774E-02
                           59.54 3.977E-02 %(  7.578E-01 2.26E-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	3.8416E-02	3.9589E-02	3.3975E-01	3.3975E-01	3.821E-01
K-40		1.1757E+01	1.1757E+01	1.6490E+00	1.7761E+00	4.383E-01
MN-54	#A	-4.9957E-04	-5.0215E-04	3.0429E-01	3.0429E-01	6.400E-02
CO-57	#B	-1.7002E-02	-1.7104E-02	5.6939E-02	5.6947E-02	6.275E-02
CO-60	#B	-6.5017E-04	-6.5071E-04	7.9038E-02	7.9039E-02	5.416E-02

Sr-85	#A	-1.0975E-02	-1.1251E-02	5.2131E-02	5.2135E-02	5.756E-02
Kr-85	#A	-2.7595E+02	-2.7595E+02	1.1933E+03	1.1934E+03	1.348E+03
Y-88	#B	3.4575E-03	3.5100E-03	3.6587E-02	3.6588E-02	4.680E-02
NB-94	#B	-8.4512E-03	-8.4512E-03	4.7846E-02	4.7849E-02	5.564E-02
Ag-108M	#B	0.0000E+00	0.0000E+00	6.1256E-02	6.1256E-02	7.157E-02
CD-109	#A	7.2329E-02	7.2586E-02	2.2186E+00	2.2186E+00	2.467E+00
SN-113	#B	-6.5676E-03	-6.6599E-03	5.7011E-02	5.7012E-02	6.438E-02
SB-125	#B	-4.4773E-02	-4.4844E-02	1.7016E-01	1.7018E-01	1.681E-01
I-131	#B	6.2883E-03	7.6788E-03	4.8386E-02	4.8388E-02	4.527E-02
CS-134	#B	2.8684E-02	2.8746E-02	3.3809E-02	3.3848E-02	4.271E-02
CS-137	#A	7.3132E-03	7.3143E-03	3.8090E-02	3.8092E-02	4.455E-02
CE-139	#A	-1.0054E-02	-1.0172E-02	5.3479E-02	5.3483E-02	5.646E-02
EU-152	#B	-4.8988E-02	-4.9005E-02	1.7100E-01	1.7102E-01	1.804E-01
EU-154	#B	-3.4293E-02	-3.4311E-02	1.1628E-01	1.1630E-01	1.274E-01
EU-155	#B	1.7794E-01	1.7809E-01	2.5205E-01	2.5225E-01	2.754E-01
HG-203	#B	2.0541E-02	2.1262E-02	4.7307E-02	4.7322E-02	5.052E-02
TL-208		2.9717E-01	2.9717E-01	7.6173E-02	7.7977E-02	
PB-212	#	8.1026E-01	8.1026E-01	1.4117E-01	1.4831E-01	1.208E-01
PB-214	#	5.8585E-01	5.8585E-01	1.2836E-01	1.3250E-01	9.273E-02
BI-212		7.6901E-01	7.6901E-01	5.2686E-01	5.2863E-01	
BI-214		7.4750E-01	7.4750E-01	1.6350E-01	1.6880E-01	
RA-224	#A	6.6426E-01	6.6426E-01	1.3024E+00	1.3029E+00	1.433E+00
RA-226	#	1.5097E+00	1.5097E+00	1.3262E+00	1.3289E+00	1.420E+00
AC-228	F	2.3194E-01	2.3194E-01	1.2081E-01	1.2151E-01	2.272E-01
TH-227	#B	-2.0409E-01	-2.0409E-01	4.9508E-01	4.9521E-01	5.401E-01
PA-234	#B	-6.7074E-02	-6.7074E-02	2.1557E-01	2.1560E-01	2.390E-01
TH-234	#B	1.9327E+00	1.9327E+00	2.0394E+00	2.0422E+00	5.017E+00
AM-241	#A	3.9774E-02	3.9774E-02	6.7787E-01	6.7787E-01	7.578E-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) 1.3802740E+01 pCi/gm
Total Decayed Activity (1460.5 to 1999.0 keV) 1.3802740E+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_14AUG2006_1145.An1

Sample description
FSS-OOL-10-02-021-F-I

Spectrum Filename: C:\GammaVision\Spectra\102F_14AUG2006_1145.An1

Acquisition information
Start time: 14-Aug-2006 11:45:39
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: 1.1330E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.1330E+03) =
8.8261E+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-Aug-2006 15:47:00
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: 0.6031

***** 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
77.10	134.	26.39	1.50	9.541E-03	77.11	10.700	1.565E+00	PB214
					77.11	17.500	9.571E-01	PB212
77.10	134.	26.39	1.50	9.541E-03	77.11	10.700	1.565E+00	PB214
					77.11	17.500	9.571E-01	PB212
186.50	71.	27.80	1.50	1.627E-02	185.99	3.280	1.595E+00	RA226
209.64	82.	28.91	1.87	1.518E-02				
239.10	369.	5.90	1.22	1.378E-02	238.63	43.100	7.390E-01	PB212
241.74	58.	31.25	1.22	1.366E-02	241.00	3.900	PBC<MDA	RA224
					241.92	7.470	6.815E-01	PB214
295.84	82.	16.87	1.26	1.145E-02	295.22	19.200	4.440E-01	PB214
300.51	46.	27.47	1.26	1.128E-02				
338.64	84.	18.79	1.14	1.005E-02	338.40	12.010	8.292E-01	AC228
352.20	132.	13.03	1.16	9.673E-03	351.99	37.100	4.358E-01	PB214
511.10	99.	19.69	1.69	6.690E-03	510.72	22.500	7.823E-01	TL208
584.25	145.	11.63	1.00	5.879E-03	583.14	86.000	3.395E-01	TL208
610.41	106.	12.87	1.01	5.640E-03	609.32	46.090	4.865E-01	BI214
912.29	89.	18.80	2.10	3.917E-03	911.07	29.000	9.309E-01	AC228
969.50	76.	14.52	2.29	3.718E-03	968.90	17.460	1.392E+00	AC228
1174.79	20.	39.95	1.85	3.157E-03	1173.23	99.860	PBC<MDA	CO60
1334.43	16.	40.66	1.96	2.834E-03	1332.51	99.980	PBC<MDA	CO60
1462.98	359.	5.28	1.92	2.617E-03	1460.75	10.700	1.526E+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

418.89	209.64	160.	82.	0.041	86.73	1.867	NP-239	s

Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM	Suspected	
477.84	239.08	52.	369.	0.184	17.70	1.215	PB-212	D
483.11	241.71	137.	58.	0.029	93.76	1.217	PB-214	D
600.48	300.41	55.	41.	0.021	88.02	1.423	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-214	153.80	77.11	558.	134.	0.067	79.18	1.500D
PB-212	153.80	77.11	558.	134.	0.067	79.18	1.500D
RA-226	372.62	186.50	189.	71.	0.036	83.39	1.500
PB-212	477.64	239.01	181.	297.	0.148	25.95	1.500
PB-214	591.27	295.81	111.	89.	0.044	59.67	1.500
AC-228	676.95	338.64	66.	84.	0.042	56.36	1.144
PB-214	704.55	352.43	62.	121.	0.060	38.69	1.500
TL-208	1021.97	511.10	68.	99.	0.049	59.07	1.690s
TL-208	1168.34	584.25	37.	144.	0.072	34.90	0.998
BI-214	1220.68	610.41	29.	106.	0.053	38.61	1.009
AC-228	1824.71	912.29	39.	89.	0.044	56.41	2.098s
AC-228	1939.20	969.50	16.	76.	0.038	43.56	2.291s
CO-60	2350.05	1174.79	22.	20.	0.010	119.85	1.854s
CO-60	2669.56	1334.43	14.	16.	0.008	121.98	1.959s
K-40	2926.86	1462.98	-4.	351.	0.175	15.81	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	Peak MDA Value pCi/gm	COMMENTS
BE-7		4.4262E-02					
			477.56	4.426E-02	%(	4.510E-01	1.26E-01 G
K-40		1.4915E+01					
			1460.75	1.491E+01	(P	3.135E-01	7.86E-01 G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
MN-54	7.1995E-04						
		834.81	7.199E-04	%(P	6.458E-02	1.73E-02	G
CO-57	-2.1198E-03						
		122.07	-2.120E-03	%(	5.889E-02	1.72E-02	G K
		136.43	3.151E-02	&	5.360E-01	1.58E-01	G
CO-60	7.2865E-02						
		1332.51	6.953E-02	*(P	8.620E-02	2.84E-02	G K
		1173.23	7.620E-02	(	9.350E-02	3.04E-02	G K
Sr-85	-2.1150E-02						
		514.00	-2.115E-02	%(	9.527E-02	2.81E-02	G
Kr-85	-4.6371E+02						
		513.99	-4.637E+02	%(	2.089E+03	6.15E+02	G
Y-88	-3.7842E-05						
		1836.01	-3.784E-05	&(P	9.703E-02	2.47E-02	G K
		898.02	3.416E-02	% P	7.271E-02	2.19E-02	G
NB-94	1.1676E-04						
		871.10	1.168E-04	%(	8.196E-02	2.25E-02	G K
		702.50	2.182E-02	%	5.914E-02	1.75E-02	G K
Ag-108M	4.2206E-03						
		722.95	4.221E-03	%(	6.803E-02	1.87E-02	G K
		614.37	-1.502E-02	% P	7.147E-02	2.06E-02	G
		433.93	-5.974E-03	%	6.370E-02	1.82E-02	G
CD-109	1.5948E+00						
		88.04	1.595E+00	%(P	2.797E+00	8.52E-01	G
SN-113	-3.8931E-03						
		391.71	-3.893E-03	&(	8.614E-02	2.45E-02	G K
		255.04	2.724E-01	%	2.326E+00	6.78E-01	G
SB-125	-7.1819E-02						
		427.95	-7.182E-02	%(P	2.150E-01	6.34E-02	G K
		600.77	-1.669E-03	& P	2.889E-01	7.81E-02	G
		636.15	5.823E-02	& P	5.073E-01	1.42E-01	G
		463.51	2.223E-01	% P	4.973E-01	1.49E-01	G
		176.29	-1.106E-01	% P	7.831E-01	2.29E-01	G
I-131	-2.5642E-02						
		364.48	-2.564E-02	%(	9.673E-02	2.85E-02	G K
		636.97	0.000E+00	&	1.704E+00	4.79E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
		284.29	-1.562E-01	%	1.358E+00	3.96E-01	G
CS-134	0.0000E+00						
		604.66	0.000E+00	%(	7.711E-02	2.16E-02	G K
		795.76	3.053E-02	%	7.954E-02	2.37E-02	G
		569.29	-7.646E-02	%	4.096E-01	1.18E-01	G
		801.84	-8.635E-02	% P	7.966E-01	2.22E-01	G
CS-137	1.4945E-02						
		661.62	1.494E-02	%(	8.022E-02	2.30E-02	G
CE-139	1.0473E-02						
		165.85	1.047E-02	&(P	6.486E-02	1.92E-02	G
EU-152	-1.9085E-02						
		121.78	-1.909E-02	%(P	1.855E-01	5.46E-02	G K
		344.30	3.955E-02	%	1.846E-01	5.40E-02	G
		1408.08	-7.862E-02	%	4.144E-01	1.16E-01	G
		964.00	-1.472E-01	% P	6.622E-01	1.91E-01	G
		1112.07	0.000E+00	&	7.071E-01	1.93E-01	G
		778.90	-1.051E-01	% P	5.298E-01	1.51E-01	G
EU-154	-9.7888E-03						
		123.10	-9.789E-03	%(P	1.384E-01	4.08E-02	G K
		1274.80	5.239E-03	%	2.327E-01	6.17E-02	G
		723.30	5.390E-02	% P	3.301E-01	9.33E-02	G
		1004.80	-5.451E-02	%	4.356E-01	1.21E-01	G
EU-155	1.9822E-01						
		86.45	1.982E-01	%(P	3.378E-01	1.03E-01	G K
		105.31	1.454E-02	%	3.053E-01	9.00E-02	G
HG-203	6.9906E-05						
		279.17	6.991E-05	%(P	6.940E-02	2.00E-02	G K
		72.87	-6.535E-01	%	2.965E+00	8.89E-01	G
		70.83	-1.220E+00	&	5.601E+00	1.68E+00	G
		82.50	-1.557E+00	%	5.411E+00	1.62E+00	G
TL-208	3.3953E-01						
		583.14	3.395E-01	(P	7.295E-02	3.97E-02	G
		510.72	7.823E-01	+	3.262E-01	1.54E-01	G
PB-212	5.9447E-01						
		238.63	5.945E-01	(	1.310E-01	5.14E-02	G K
							Energy duplication
		77.11	9.571E-01	+	8.058E-01	2.53E-01	G
		74.81	1.066E+00	& P	1.692E+00	5.16E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
PB-214	4.2862E-01						
		351.99	4.015E-01	(P	1.309E-01	5.19E-02	G K
		295.22	4.810E-01	(	2.813E-01	9.57E-02	G
							Energy duplication
		77.11	1.565E+00	+	1.318E+00	4.13E-01	G
		241.92	5.476E-01	%	8.010E-01	2.47E-01	G
BI-212	2.8991E-01						
		727.17	2.899E-01	%(	5.382E-01	1.66E-01	G K
		1620.56	-5.192E-01	% P	3.245E+00	8.72E-01	G
		785.42	8.393E-01	& P	3.672E+00	1.06E+00	G
BI-214	4.8648E-01						
		609.32	4.865E-01	(	1.270E-01	6.27E-02	G K
		1764.51	2.399E-01	% P	4.843E-01	1.49E-01	G
		1120.28	2.032E-02	%	7.181E-01	1.99E-01	G
RA-224	1.1017E+00						
		241.00	1.102E+00	&(P	1.518E+00	4.69E-01	G
RA-226	1.5951E+00						
		185.99	1.595E+00	(P	1.491E+00	4.71E-01	G
AC-228	1.0477E+00						
		911.07	9.309E-01	(P	3.345E-01	1.76E-01	G K
		968.90	1.392E+00	@(P	3.948E-01	2.02E-01	G
		338.40	8.292E-01	(	4.005E-01	1.56E-01	G
TH-227	-1.6904E-01						
		236.00	-1.690E-01	&(P	4.587E-01	1.38E-01	G K
		256.25	-8.489E-03	&	7.395E-01	2.14E-01	G
PA-234	-4.3610E-02						
		98.44	-4.361E-02	&(	3.039E-01	9.03E-02	G K
		946.00	0.000E+00	%	4.728E-01	1.31E-01	G
		131.28	4.709E-03	&	2.861E-01	8.41E-02	G
		94.67	2.786E-01	%	5.454E-01	1.66E-01	G
		883.24	4.290E-03	%	6.216E-01	1.69E-01	G
		926.70	-1.128E-01	%	7.062E-01	1.99E-01	G
		569.26	-1.129E-01	%	6.050E-01	1.74E-01	G
TH-234	1.5414E+00						
		63.29	1.541E+00	%(P	6.189E+00	1.85E+00	G K
		92.80	1.303E+00	%	3.252E+00	9.82E-01	G
		92.38	-1.530E-01	% P	4.050E+00	1.20E+00	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
AM-241	-2.7325E-01						
		59.54	-2.732E-01	%(	9.735E-01	2.92E-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	4.1571E-02	4.4262E-02	3.7729E-01	3.7729E-01	4.236E-01
K-40		1.4915E+01	1.4915E+01	2.3589E+00	2.5030E+00	3.135E-01
MN-54	#A	7.1226E-04	7.1995E-04	5.1802E-02	5.1802E-02	6.389E-02
CO-57	#B	-2.0937E-03	-2.1198E-03	5.1706E-02	5.1706E-02	5.817E-02
CO-60	#A	7.2738E-02	7.2865E-02	6.2451E-02	6.2584E-02	8.605E-02
Sr-85	#A	-2.0085E-02	-2.1150E-02	8.4220E-02	8.4228E-02	9.047E-02
Kr-85	#A	-4.6370E+02	-4.6371E+02	1.8464E+03	1.8466E+03	2.088E+03
Y-88	#B	-3.6671E-05	-3.7842E-05	9.7248E-04	9.7248E-04	9.403E-02
NB-94	#B	1.1676E-04	1.1676E-04	6.7424E-02	6.7424E-02	8.196E-02
Ag-108M	#B	4.2203E-03	4.2206E-03	5.6119E-02	5.6119E-02	6.802E-02
CD-109	#A	1.5831E+00	1.5948E+00	2.5546E+00	2.5561E+00	2.776E+00

SN-113	#B	-3.7814E-03	-3.8931E-03	7.3525E-02	7.3526E-02	8.367E-02
SB-125	#B	-7.1582E-02	-7.1819E-02	2.1900E-01	2.1904E-01	2.142E-01
I-131	#B	-1.6905E-02	-2.5642E-02	8.5471E-02	8.5483E-02	6.377E-02
CS-134	#B	0.0000E+00	0.0000E+00	6.4884E-02	6.4884E-02	7.677E-02
CS-137	#A	1.4940E-02	1.4945E-02	6.9056E-02	6.9061E-02	8.019E-02
CE-139	#A	1.0221E-02	1.0473E-02	5.7550E-02	5.7553E-02	6.330E-02
EU-152	#B	-1.9072E-02	-1.9085E-02	2.0485E-01	2.0485E-01	1.853E-01
EU-154	#B	-9.7782E-03	-9.7888E-03	1.3160E-01	1.3161E-01	1.383E-01
EU-155	#B	1.9785E-01	1.9822E-01	3.0841E-01	3.0861E-01	3.371E-01
HG-203	#B	6.5057E-05	6.9906E-05	5.9968E-02	5.9968E-02	6.459E-02
TL-208		3.3953E-01	3.3953E-01	1.1882E-01	1.2034E-01	
PB-212	#	5.9447E-01	5.9447E-01	1.5428E-01	1.5785E-01	1.310E-01
PB-214	#	4.2862E-01	4.2862E-01	1.5255E-01	1.5444E-01	1.309E-01
BI-212	#B	2.8991E-01	2.8991E-01	4.9683E-01	4.9710E-01	5.382E-01
BI-214		4.8648E-01	4.8648E-01	1.8784E-01	1.8982E-01	
RA-224	#A	1.1017E+00	1.1017E+00	1.4062E+00	1.4076E+00	1.518E+00
RA-226	#	1.5951E+00	1.5951E+00	1.4134E+00	1.4162E+00	1.491E+00
AC-228		1.0477E+00	1.0477E+00	3.1769E-01	3.2309E-01	
TH-227	#B	-1.6904E-01	-1.6904E-01	4.2329E-01	4.2340E-01	4.587E-01
PA-234	#B	-4.3610E-02	-4.3610E-02	2.7089E-01	2.7090E-01	3.039E-01
TH-234	#B	1.5414E+00	1.5414E+00	5.5577E+00	5.5583E+00	6.189E+00
AM-241	#A	-2.7324E-01	-2.7325E-01	8.7632E-01	8.7645E-01	9.735E-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) 1.6788635E+01 pCi/gm
Total Decayed Activity (295.7 to 1999.0 keV) 1.6788635E+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: 103_14AUG2006_1033.An1

Sample description
OOL-10-02-007-F-S WET

Spectrum Filename: C:\GammaVision\Spectra\103_14AUG2006_1033.An1

Acquisition information
Start time: 07-Aug-2006 10:33:22
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: 2.2270E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 2.2270E+03) =
4.4903E+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	04-Aug-2006 10:55:00
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. 20 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
74.90	79.	33.06	0.99	9.052E-03	74.81	9.600	PBC<MDA	PB212
77.20	129.	17.08	0.99	1.011E-02	77.11	17.500	5.573E-01	PB212
					77.11	10.700	9.115E-01	PB214
92.78	89.	39.84	1.15	1.644E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
186.36	149.	27.37	1.47	2.565E-02	185.99	3.280	9.835E-01	RA226
210.07	79.	37.22	0.95	2.468E-02				
238.76	840.	4.20	1.09	2.319E-02	236.00	11.200	1.949E+00	TH227
					238.63	43.100	5.023E-01	PB212
241.90	143.	17.67	1.10	2.303E-02	241.00	3.900	9.649E-01	RA224
					241.92	7.470	5.049E-01	PB214
270.56	91.	30.16	1.44	2.149E-02				
295.30	211.	12.41	1.15	2.024E-02	295.22	19.200	3.224E-01	PB214
300.43	47.	38.17	1.49	2.000E-02				
338.61	133.	17.09	0.96	1.829E-02	338.40	12.010	3.650E-01	AC228
351.94	428.	9.02	1.23	1.775E-02	351.99	37.100	3.887E-01	PB214
462.99	90.	23.96	0.96	1.426E-02				
462.99	90.	23.96	0.96	1.426E-02	463.51	10.000	3.778E-01	SB125
511.34	199.	12.68	1.66	1.316E-02	510.72	22.500	3.528E-01	TL208
					513.99	0.004	2.143E+03	Kr85
					514.00	99.270	9.583E-02	Sr85
583.23	292.	9.34	1.35	1.184E-02	583.14	86.000	1.711E-01	TL208
609.42	311.	8.31	1.31	1.144E-02	609.32	46.090	3.504E-01	BI214
661.77	65.	25.96	1.49	1.072E-02	661.62	84.620	4.228E-02	CS137
727.46	83.	22.64	1.93	9.962E-03	727.17	11.800	4.258E-01	BI212
911.25	201.	11.14	1.77	8.400E-03	911.07	29.000	4.917E-01	AC228
964.98	49.	22.79	1.54	8.051E-03				

969.18	94.	14.26	1.54	8.025E-03	968.90	17.460	4.066E-01	AC228
1120.69	74.	21.92	2.16	7.212E-03	1120.28	15.040	4.146E-01	BI214
1173.54	50.	26.67	1.32	6.972E-03	1173.23	99.860	4.333E-02	CO60
1332.52	46.	21.33	2.01	6.349E-03	1332.51	99.980	4.445E-02	CO60

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
1461.16	1098.	3.11	1.90	5.931E-03	1460.75	10.700	1.031E+01	K40
1764.72	57.	15.01	2.11	5.142E-03	1764.51	15.920	4.198E-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	
184.73	92.78	559.	89.	0.045	119.51	1.149	TH-234	l
419.31	210.07	355.	79.	0.039	111.66	0.947	NP-239	s
540.26	270.56	279.	91.	0.046	90.49	1.441	AC-228	s
600.01	300.43	147.	47.	0.024	114.52	1.487	PB-212	s
925.11	462.99	133.	90.	0.045	71.87	0.957	AC-228	l
1929.14	964.85	37.	50.	0.025	67.04	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	333.	79.	0.040	99.17	0.993D
PB-212	153.39	77.11	315.	129.	0.065	51.23	0.995A
RA-226	371.51	186.17	671.	119.	0.060	86.43	1.500s
PB-212	476.78	238.81	513.	858.	0.429	15.89	1.079
RA-224	482.85	241.85	610.	138.	0.069	80.26	1.500
PB-214	482.87	241.86	336.	70.	0.035	113.56	1.059
PB-214	589.75	295.30	209.	207.	0.103	37.23	1.150s
AC-228	676.36	338.61	169.	132.	0.066	51.27	0.958
PB-214	703.01	351.94	308.	422.	0.211	27.05	1.227
TL-208	1021.79	511.34	152.	172.	0.086	38.03	1.655s
TL-208	1165.56	583.23	126.	287.	0.144	28.02	1.352
BI-214	1217.93	609.42	115.	304.	0.152	24.93	1.309
CS-137	1322.40	661.66	86.	41.	0.021	102.72	1.500
BI-212	1454.00	727.46	90.	83.	0.041	67.91	1.927s
AC-228	1821.53	911.25	87.	197.	0.099	33.42	1.765
AC-228	1936.81	968.90	45.	92.	0.046	43.82	1.541D
BI-214	2240.36	1120.69	74.	74.	0.037	65.77	2.158s
CO-60	2346.04	1173.54	59.	50.	0.025	80.00	1.318s
CO-60	2663.95	1332.52	24.	46.	0.023	64.00	2.013
K-40	2921.18	1461.16	33.	1079.	0.539	9.32	1.903
BI-214	3528.19	1764.72	7.	57.	0.028	45.02	2.111

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		9.9451E-02					
			477.56	9.945E-02	%(	2.747E-01 8.24E-02	G
K-40		1.0314E+01					
			1460.75	1.031E+01	(P	2.823E-01 3.26E-01	G
MN-54		-4.0819E-03					
			834.81	-4.082E-03	%(P	2.685E-02 7.74E-03	G
CO-57		7.7144E-04					
			122.07	7.714E-04	&(P	3.803E-02 1.13E-02	G K
			136.43	-3.486E-02	%	3.243E-01 9.69E-02	G
CO-60		4.3889E-02					
			1332.51	4.445E-02	(P	2.423E-02 1.00E-02	G K
			1173.23	4.333E-02	(P	3.369E-02 1.20E-02	G K
Sr-85		-6.4959E-03					
			514.00	-6.496E-03	%(	3.331E-02 9.87E-03	G
Kr-85		-1.4788E+02					
			513.99	-1.479E+02	%(	7.454E+02 2.21E+02	G
Y-88		3.0578E-03					
			1836.01	3.058E-03	%(P	1.858E-02 5.00E-03	G K
			898.02	-5.902E-03	% P	2.607E-02 7.51E-03	G
NB-94		0.0000E+00					
			871.10	0.000E+00	%(	3.277E-02 9.37E-03	G K
			702.50	4.883E-03	&	2.639E-02 7.71E-03	G K
Ag-108M		-1.0597E-02					
			722.95	-1.060E-02	&(	3.774E-02 1.12E-02	G K
			614.37	-1.299E-02	& P	3.210E-02 9.65E-03	G
			433.93	-5.583E-03	%	2.662E-02 7.87E-03	G
CD-109		9.5767E-01					
			88.04	9.577E-01	%(	1.512E+00 4.61E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SN-113	1.0678E-02						
		391.71	1.068E-02	%(	3.865E-02	1.15E-02	G K
		255.04	-2.765E-01	%	1.212E+00	3.62E-01	G
SB-125	-2.2546E-02						
		427.95	-2.255E-02	%(P	8.996E-02	2.68E-02	G K
		600.77	-1.180E-03	% P	1.257E-01	3.59E-02	G
		636.15	-3.717E-02	& P	2.414E-01	7.02E-02	G
		463.51	1.769E-01	% P	2.505E-01	7.74E-02	G
		176.29	-9.735E-03	%	4.543E-01	1.35E-01	G
I-131	-9.1196E-04						
		364.48	-9.120E-04	%(P	3.259E-02	9.42E-03	G K
		636.97	-2.006E-03	%	3.744E-01	1.06E-01	G
		284.29	-8.339E-02	& P	5.355E-01	1.59E-01	G
CS-134	-1.5362E-04						
		604.66	-1.536E-04	%(	2.667E-02	7.65E-03	G K
		795.76	1.580E-02	% P	3.507E-02	1.06E-02	G
		569.29	-1.878E-02	% P	1.557E-01	4.46E-02	G
		801.84	4.655E-03	% P	3.004E-01	8.46E-02	G
CS-137	2.7440E-02						
		661.62	2.744E-02	(P	3.065E-02	9.71E-03	G
CE-139	4.2179E-03						
		165.85	4.218E-03	&(	3.042E-02	9.06E-03	G
EU-152	7.1401E-03						
		121.78	7.140E-03	&(P	1.102E-01	3.28E-02	G K
		344.30	7.712E-03	% P	8.332E-02	2.45E-02	G
		1408.08	4.625E-02	%	9.994E-02	3.03E-02	G
		964.00	-1.814E-03	& P	1.814E-01	5.06E-02	G
		1112.07	1.981E-02	%	2.391E-01	6.84E-02	G
		778.90	1.361E-02	%	1.973E-01	5.64E-02	G
EU-154	-7.1920E-03						
		123.10	-7.192E-03	&(	8.464E-02	2.53E-02	G K
		1274.80	1.297E-02	%	7.268E-02	2.07E-02	G
		723.30	-5.632E-02	&	1.853E-01	5.53E-02	G
		1004.80	2.338E-03	%	1.315E-01	3.64E-02	G
EU-155	1.1624E-01						
		86.45	1.162E-01	%(	1.914E-01	5.83E-02	G K
		105.31	5.591E-02	&	1.812E-01	5.46E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
HG-203	-2.8006E-03						
		279.17	-2.801E-03	&(P	3.344E-02	9.90E-03	G K
		72.87	-1.293E-01	& P	1.815E+00	5.42E-01	G
		70.83	-2.674E-02	&	3.734E+00	1.11E+00	G
		82.50	8.596E-02	%	3.230E+00	9.63E-01	G
TL-208	1.7108E-01						
		583.14	1.711E-01	(P	3.275E-02	1.62E-02	G
		510.72	3.528E-01	+ P	1.230E-01	5.17E-02	G
PB-212	5.3435E-01						
		238.63	5.207E-01	(P	6.570E-02	2.80E-02	G K
							Energy duplication
		77.11	4.438E-01	} P	2.930E-01	7.58E-02	G
		74.81	5.537E-01	(P	6.125E-01	1.90E-01	G
PB-214	3.6606E-01						
		351.99	3.887E-01	(P	7.786E-02	3.55E-02	G K
		295.22	3.224E-01	@(P	1.095E-01	4.08E-02	G
							Energy duplication
		77.11	0.000E+00	} P	7.078E-01	0.00E+00	G
		241.92	2.481E-01	-	3.108E-01	9.37E-02	G
BI-212	4.2578E-01						
		727.17	4.258E-01	*(P	2.428E-01	9.70E-02	G K
		1620.56	4.762E-02	% P	6.503E-01	1.70E-01	G
		785.42	7.730E-01	%	1.097E+00	3.45E-01	G
BI-214	3.7725E-01						
		609.32	3.504E-01	(P	6.053E-02	2.97E-02	G K
		1764.51	4.198E-01	(P	1.139E-01	6.66E-02	G
		1120.28	4.146E-01	(P	2.393E-01	9.32E-02	G
RA-224	9.2874E-01						
		241.00	9.287E-01	(	7.944E-01	2.48E-01	G
RA-226	8.5885E-01						
		185.99	8.589E-01	(P	8.897E-01	2.74E-01	G
AC-228	4.5688E-01						
		911.07	4.917E-01	(P	1.147E-01	5.57E-02	G K
		968.90	3.990E-01	(P	1.469E-01	5.84E-02	G
		338.40	3.650E-01	- P	1.746E-01	6.29E-02	G
TH-227	-9.5326E-02						
		236.00	-9.533E-02	%(	2.843E-01	8.57E-02	G K
		256.25	6.389E-02	% P	3.572E-01	1.06E-01	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments

PA-234      -5.3599E-03
                            98.44-5.360E-03 &(P 1.637E-01 4.86E-02 G K
                           946.00-2.508E-02 % P 1.585E-01 4.61E-02 G
                           131.28 7.243E-03 & P 1.406E-01 4.17E-02 G
                            94.67-6.315E-02 & P 3.238E-01 9.71E-02 G
                           883.24-5.986E-02 %   2.464E-01 7.24E-02 G
                           926.70 6.004E-02 %   1.533E-01 4.57E-02 G
                           569.26-2.530E-02 % P 2.353E-01 6.75E-02 G

TH-234       1.4178E+00
                            63.29 1.418E+00 %(P 4.904E+00 1.47E+00 G K
                            92.80 9.562E-01 % P 1.701E+00 5.15E-01 G
                            92.38 1.061E+00 % P 2.085E+00 6.30E-01 G

AM-241      -1.9942E-02
                            59.54-1.994E-02 &(P 8.565E-01 2.54E-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	9.5671E-02	9.9451E-02	2.4729E-01	2.4736E-01	2.642E-01
K-40		1.0314E+01	1.0314E+01	9.7843E-01	1.1471E+00	
MN-54	#A	-4.0550E-03	-4.0819E-03	2.6161E-02	2.6162E-02	2.667E-02
CO-57	#B	7.6555E-04	7.7144E-04	3.3903E-02	3.3903E-02	3.774E-02
CO-60		4.3842E-02	4.3889E-02	2.3521E-02	2.3658E-02	
Sr-85	#A	-6.2919E-03	-6.4959E-03	2.9622E-02	2.9624E-02	3.227E-02
Kr-85	#A	-1.4788E+02	-1.4788E+02	6.6294E+02	6.6299E+02	7.453E+02
Y-88	#B	2.9990E-03	3.0578E-03	1.4998E-02	1.4999E-02	1.823E-02
NB-94	#B	0.0000E+00	0.0000E+00	2.8112E-02	2.8112E-02	3.277E-02
Ag-108M	#B	-1.0597E-02	-1.0597E-02	3.3668E-02	3.3673E-02	3.774E-02
CD-109	#A	9.5330E-01	9.5767E-01	1.3843E+00	1.3853E+00	1.505E+00
SN-113	#B	1.0488E-02	1.0678E-02	3.4566E-02	3.4572E-02	3.796E-02
SB-125	#B	-2.2500E-02	-2.2546E-02	8.0642E-02	8.0653E-02	8.978E-02
I-131	#B	-7.0504E-04	-9.1196E-04	6.9147E-02	6.9147E-02	2.520E-02
CS-134	#B	-1.5320E-04	-1.5362E-04	2.2961E-02	2.2961E-02	2.660E-02
CS-137	#A	2.7435E-02	2.7440E-02	2.9139E-02	2.9182E-02	3.065E-02
CE-139	#A	4.1549E-03	4.2179E-03	2.7171E-02	2.7172E-02	2.996E-02
EU-152	#B	7.1369E-03	7.1401E-03	9.8426E-02	9.8427E-02	1.102E-01
EU-154	#B	-7.1872E-03	-7.1920E-03	7.5763E-02	7.5764E-02	8.458E-02
EU-155	#B	1.1611E-01	1.1624E-01	1.7502E-01	1.7514E-01	1.912E-01
HG-203	#B	-2.6790E-03	-2.8006E-03	2.9993E-02	2.9993E-02	3.199E-02
TL-208		1.7108E-01	1.7108E-01	4.8648E-02	4.9652E-02	
PB-212		5.3435E-01	5.3435E-01	8.6073E-02	9.1493E-02	
PB-214		3.6606E-01	3.6606E-01	8.5703E-02	8.8299E-02	
BI-212	#	4.2578E-01	4.2578E-01	2.9088E-01	2.9192E-01	
BI-214		3.7725E-01	3.7725E-01	9.6057E-02	9.8523E-02	
RA-224		9.2874E-01	9.2874E-01	7.4544E-01	7.4739E-01	7.944E-01
RA-226	#A	8.5885E-01	8.5885E-01	8.2297E-01	8.2448E-01	8.897E-01
AC-228		4.5688E-01	4.5688E-01	1.2681E-01	1.2955E-01	
TH-227	#B	-9.5326E-02	-9.5326E-02	2.5698E-01	2.5704E-01	2.843E-01
PA-234	#B	-5.3599E-03	-5.3599E-03	2.4018E-01	2.4018E-01	1.637E-01
TH-234	#B	1.4178E+00	1.4178E+00	4.4134E+00	4.4141E+00	4.904E+00
AM-241	#A	-1.9942E-02	-1.9942E-02	8.8413E-01	8.8413E-01	8.565E-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) 1.3618178E+01 pCi/gm
Total Decayed Activity (1120.0 to 2000.7 keV) 1.3618226E+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_8AUG2006_1434.An1

Sample description
FSS-OOL-10-02-014-F-A

Spectrum Filename: C:\GammaVision\Spectra\103F_8AUG2006_1434.An1

Acquisition information
Start time: 08-Aug-2006 14:34:39
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: 1.7350E+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	07-Aug-2006 13:25:00
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. 10 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.3266

***** 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	51.	33.44	0.99	9.052E-03	74.81	9.600	PBC<MDA	PB212
77.25	54.	3.00	0.99	1.011E-02	77.11	17.500	3.802E-01	PB212
					77.11	10.700	6.218E-01	PB214
92.23	89.	30.58	1.55	1.625E-02				
92.23	89.	30.58	1.55	1.625E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
186.06	108.	25.03	1.62	2.566E-02	185.99	3.280	8.793E-01	RA226
238.84	332.	6.70	1.09	2.319E-02	238.63	43.100	2.492E-01	PB212
					241.92	7.470	1.503E+00	PB214
295.39	116.	18.05	1.16	2.024E-02	295.22	19.200	2.243E-01	PB214
338.94	58.	25.13	1.49	1.828E-02	338.40	12.010	2.024E-01	AC228
352.12	231.	10.20	1.21	1.775E-02	351.99	37.100	2.665E-01	PB214
510.47	77.	21.54	1.68	1.318E-02				
510.47	77.	21.54	1.68	1.318E-02	510.72	22.500	1.323E-01	TL208
583.51	137.	13.60	1.00	1.184E-02	583.14	86.000	1.015E-01	TL208
609.78	153.	12.43	1.28	1.143E-02	609.32	46.090	2.169E-01	BI214
727.53	26.	36.52	1.37	9.961E-03	727.17	11.800	PBC<MDA	BI212
911.70	84.	14.26	1.88	8.397E-03	911.07	29.000	2.591E-01	AC228
969.87	36.	23.36	1.61	8.020E-03	968.90	17.460	2.015E-01	AC228
1120.97	32.	25.21	1.19	7.209E-03	1120.28	15.040	2.191E-01	BI214
1461.75	538.	4.53	1.71	5.929E-03	1460.75	10.700	6.367E+00	K40
1765.68	22.	20.00	0.90	5.142E-03	1764.51	15.920	2.067E-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
483.49	242.10	89.	52.	0.026	86.75	1.095	PB-214 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	138.	51.	0.025	100.33	0.993D
PB-212	153.39	77.11	154.	54.	0.027	9.00	0.995A
RA-226	371.92	186.38	307.	77.	0.038	87.02	1.500s
PB-212	476.73	238.79	282.	305.	0.152	30.64	1.031
PB-214	476.82	238.83	111.	283.	0.142	23.81	1.500s
PB-214	589.92	295.39	133.	112.	0.056	54.16	1.161
AC-228	676.30	338.58	97.	55.	0.028	83.57	1.500s
PB-214	703.37	352.12	114.	225.	0.113	30.60	1.214
TL-208	1166.30	583.60	51.	100.	0.050	40.27	1.500
BI-214	1218.66	609.78	63.	147.	0.073	37.29	1.280
BI-212	1454.22	727.57	26.	27.	0.013	96.98	1.500
AC-228	1823.10	912.04	21.	72.	0.036	42.03	1.505s
AC-228	1938.35	969.67	26.	36.	0.018	78.07	1.541
BI-214	2240.91	1120.97	17.	31.	0.015	75.63	1.194
K-40	2922.36	1461.75	30.	519.	0.259	13.58	1.705
BI-214	3530.12	1765.68	3.	22.	0.011	60.00	0.900s

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		2.2016E-02					
			477.56	2.202E-02	&(	1.886E-01 5.38E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
K-40	6.3672E+00						
		1460.75	6.367E+00	(P	3.471E-01	2.99E-01	G
MN-54	4.8495E-03						
		834.81	4.850E-03	&(P	2.564E-02	7.34E-03	G
CO-57	2.7207E-03						
		122.07	2.721E-03	&(P	3.604E-02	1.07E-02	G K
		136.43	-1.472E-02	%	2.856E-01	8.45E-02	G
CO-60	2.9674E-04						
		1332.51	2.967E-04	%(P	2.440E-02	6.11E-03	G K
		1173.23	-9.556E-04	% P	2.559E-02	6.58E-03	G K
Sr-85	-1.0093E-02						
		514.00	-1.009E-02	&(	3.028E-02	9.04E-03	G
Kr-85	-2.3042E+02						
		513.99	-2.304E+02	&(	6.912E+02	2.06E+02	G
Y-88	-9.9694E-05						
		1836.01	-9.969E-05	&(P	1.167E-02	1.58E-03	G K
		898.02	-6.143E-04	% P	2.372E-02	6.29E-03	G
NB-94	0.0000E+00						
		871.10	0.000E+00	%(	2.248E-02	6.08E-03	G K
		702.50	5.421E-04	&	2.426E-02	6.77E-03	G K
Ag-108M	-3.2156E-04						
		722.95	-3.216E-04	&(	3.030E-02	8.50E-03	G K
		614.37	1.873E-03	% P	2.370E-02	6.67E-03	G
		433.93	3.978E-03	%	1.927E-02	5.58E-03	G
CD-109	6.4149E-02						
		88.04	6.415E-02	%(	9.544E-01	2.80E-01	G
SN-113	3.5861E-03						
		391.71	3.586E-03	%(	3.390E-02	9.81E-03	G K
		255.04	-7.421E-02	&	7.918E-01	2.29E-01	G
SB-125	-9.6667E-04						
		427.95	-9.667E-04	%(P	6.366E-02	1.79E-02	G K
		600.77	1.792E-02	% P	1.215E-01	3.48E-02	G
		636.15	-2.742E-02	% P	2.095E-01	5.93E-02	G
		463.51	1.221E-01	% P	1.991E-01	6.13E-02	G
		176.29	1.746E-03	&	3.903E-01	1.15E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
I-131	5.6867E-03						
		364.48	5.687E-03	%(P	2.702E-02	7.90E-03	G K
		636.97	-4.122E-02	%	3.502E-01	9.98E-02	G
		284.29	5.858E-02	% P	3.933E-01	1.15E-01	G
CS-134	-5.6048E-03						
		604.66	-5.605E-03	%(	2.594E-02	7.56E-03	G K
		795.76	1.875E-02	% P	2.620E-02	8.33E-03	G
		569.29	-7.069E-03	% P	1.656E-01	4.62E-02	G
		801.84	-1.580E-02	% P	2.948E-01	7.96E-02	G
CS-137	-3.4703E-03						
		661.62	-3.470E-03	%(P	2.931E-02	8.18E-03	G
CE-139	-8.7314E-03						
		165.85	-8.731E-03	%(	3.398E-02	1.02E-02	G
EU-152	-5.1780E-03						
		121.78	-5.178E-03	&(P	1.010E-01	2.97E-02	G K
		344.30	2.112E-02	& P	7.900E-02	2.34E-02	G
		1408.08	0.000E+00	%	1.669E-01	4.57E-02	G
		964.00	-1.224E-02	% P	2.178E-01	6.07E-02	G
		1112.07	3.220E-02	&	2.360E-01	6.71E-02	G
		778.90	0.000E+00	&	2.107E-01	5.87E-02	G
EU-154	8.5269E-03						
		123.10	8.527E-03	%(	7.325E-02	2.17E-02	G K
		1274.80	1.457E-02	&	7.800E-02	2.21E-02	G
		723.30	-4.148E-02	%	1.548E-01	4.56E-02	G
		1004.80	-1.167E-02	%	1.532E-01	4.26E-02	G
EU-155	-4.7756E-02						
		86.45	-4.776E-02	&(	1.540E-01	4.62E-02	G K
		105.31	1.431E-02	%	1.295E-01	3.82E-02	G
HG-203	4.5055E-03						
		279.17	4.506E-03	&(P	2.949E-02	8.69E-03	G K
		72.87	-1.997E-01	% P	1.484E+00	4.41E-01	G
		70.83	4.191E-02	%	2.779E+00	8.18E-01	G
		82.50	-1.776E-01	%	2.501E+00	7.39E-01	G
TL-208	7.6820E-02						
		583.14	7.682E-02	(P	2.747E-02	1.08E-02	G
		510.72	6.659E-02	% P	1.267E-01	3.62E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
PB-212	2.3738E-01						
		238.63	2.374E-01	(P	6.310E-02	2.52E-02	G K
							Energy duplication
		77.11	2.374E-01	} P	2.661E-01	7.12E-03	G
		74.81	4.548E-01	+ P	5.154E-01	1.61E-01	G
PB-214	2.5210E-01						
		351.99	2.665E-01	(P	6.195E-02	2.79E-02	G K
		295.22	2.243E-01	(P	1.131E-01	4.20E-02	G
							Energy duplication
		77.11	1.783E-01	} P	6.075E-01	1.54E-01	G
		241.92	1.283E+00	+	2.346E-01	1.02E-01	G
BI-212	1.7853E-01						
		727.17	1.785E-01	(P	1.757E-01	5.88E-02	G K
		1620.56	-1.590E-04	% P	9.451E-01	2.44E-01	G
		785.42	-2.462E-01	&	1.363E+00	3.93E-01	G
BI-214	2.1523E-01						
		609.32	2.169E-01	(P	5.872E-02	2.82E-02	G K
		1764.51	2.067E-01	(P	1.060E-01	4.76E-02	G
		1120.28	2.191E-01	(P	1.594E-01	5.87E-02	G
RA-224	3.9432E-01						
		241.00	3.943E-01	&(	6.573E-01	2.01E-01	G
RA-226	7.1004E-01						
		185.99	7.100E-01	(P	7.800E-01	2.41E-01	G
AC-228	2.1375E-01						
		911.07	2.302E-01	(P	7.761E-02	3.38E-02	G K
		968.90	1.984E-01	(P	1.465E-01	5.18E-02	G
		338.40	1.963E-01	*(P	1.720E-01	5.58E-02	G
TH-227	-6.1119E-02						
		236.00	-6.112E-02	%(	2.520E-01	7.52E-02	G K
		256.25	-3.996E-02	% P	3.229E-01	9.48E-02	G
PA-234	1.3734E-02						
		98.44	1.373E-02	%(P	1.424E-01	4.21E-02	G K
		946.00	-4.048E-03	% P	1.406E-01	3.90E-02	G
		131.28	1.622E-02	% P	1.424E-01	4.22E-02	G
		94.67	-6.787E-02	% P	2.749E-01	8.22E-02	G
		883.24	1.938E-02	&	1.856E-01	5.15E-02	G
		926.70	-1.910E-02	%	2.045E-01	5.65E-02	G
		569.26	-1.048E-02	% P	2.454E-01	6.84E-02	G

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 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments

TH-234       3.8621E-01
                           63.29 3.862E-01 &(P 4.242E+00 1.25E+00 G K
                           92.80 8.910E-01 % P 1.377E+00 4.17E-01 G
                           92.38 1.072E+00 % P 1.662E+00 5.03E-01 G

AM-241       1.3108E-02
                           59.54 1.311E-02 %(P 7.769E-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:                      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	2.1718E-02	2.2016E-02	1.6152E-01	1.6152E-01	1.860E-01
K-40		6.3672E+00	6.3672E+00	8.9595E-01	9.6921E-01	
MN-54	#A	4.8383E-03	4.8495E-03	2.2014E-02	2.2016E-02	2.558E-02
CO-57	#B	2.7133E-03	2.7207E-03	3.1989E-02	3.1990E-02	3.594E-02
CO-60	#B	2.9663E-04	2.9674E-04	1.8318E-02	1.8318E-02	2.439E-02
Sr-85	#A	-9.9808E-03	-1.0093E-02	2.7106E-02	2.7112E-02	2.994E-02

Kr-85	#A	-2.3042E+02	-2.3042E+02	6.1879E+02	6.1894E+02	6.912E+02
Y-88	#B	-9.9017E-05	-9.9694E-05	5.9817E-04	5.9819E-04	1.159E-02
NB-94	#B	0.0000E+00	0.0000E+00	1.8252E-02	1.8252E-02	2.248E-02
Ag-108M	#B	-3.2155E-04	-3.2156E-04	2.5509E-02	2.5509E-02	3.029E-02
CD-109	#A	6.4046E-02	6.4149E-02	8.3924E-01	8.3925E-01	9.529E-01
SN-113	#B	3.5635E-03	3.5861E-03	2.9428E-02	2.9429E-02	3.368E-02
SB-125	#B	-9.6597E-04	-9.6667E-04	6.1513E-02	6.1513E-02	6.362E-02
I-131	#B	5.1953E-03	5.6867E-03	2.3714E-02	2.3716E-02	2.468E-02
CS-134	#B	-5.5994E-03	-5.6048E-03	2.2688E-02	2.2690E-02	2.591E-02
CS-137	#A	-3.4701E-03	-3.4703E-03	5.0215E-02	5.0215E-02	2.930E-02
CE-139	#A	-8.6854E-03	-8.7314E-03	3.0496E-02	3.0500E-02	3.380E-02
EU-152	#B	-5.1772E-03	-5.1780E-03	1.3663E-01	1.3663E-01	1.009E-01
EU-154	#B	8.5249E-03	8.5269E-03	6.5158E-02	6.5160E-02	7.323E-02
EU-155	#B	-4.7737E-02	-4.7756E-02	1.3865E-01	1.3868E-01	1.539E-01
HG-203	#B	4.4358E-03	4.5055E-03	2.6073E-02	2.6075E-02	2.904E-02
TL-208	#	7.6820E-02	7.6820E-02	3.2259E-02	3.2566E-02	2.747E-02
PB-212		2.3738E-01	2.3738E-01	7.5600E-02	7.6846E-02	
PB-214		2.5210E-01	2.5210E-01	7.9062E-02	8.0406E-02	
BI-212	#	1.7853E-01	1.7853E-01	1.7631E-01	1.7662E-01	1.757E-01
BI-214		2.1523E-01	2.1523E-01	8.0958E-02	8.1917E-02	
RA-224	#A	3.9432E-01	3.9432E-01	6.0306E-01	6.0350E-01	6.573E-01
RA-226	#A	7.1004E-01	7.1004E-01	7.2219E-01	7.2337E-01	7.800E-01
AC-228	#	2.1375E-01	2.1375E-01	8.8257E-02	8.9125E-02	7.761E-02
TH-227	#B	-6.1119E-02	-6.1119E-02	2.2570E-01	2.2572E-01	2.520E-01
PA-234	#B	1.3734E-02	1.3734E-02	1.2620E-01	1.2620E-01	1.424E-01
TH-234	#B	3.8621E-01	3.8621E-01	3.7371E+00	3.7372E+00	4.242E+00
AM-241	#A	1.3108E-02	1.3108E-02	6.8445E-01	6.8445E-01	7.769E-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 (86.9 to 2000.7 keV) 7.0719376E+00 pCi/gm
Total Decayed Activity (86.9 to 2000.7 keV) 7.0719376E+00 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
DAT

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

Sample description
FSS-OOL-10-02-003-F

Spectrum Filename: C:\GammaVision\Spectra\103F_9AUG2006_1602.An1

Acquisition information

Start time:	09-Aug-2006 16:02:55
Live time:	2000
Real time:	2002
Dead time:	0.12 %
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:	1.9620E+03
Activity scaling factor:	1.0000E+06/(1.0000E+00* 1.9620E+03) = 5.0968E+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	07-Aug-2006 10:00:00
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. 18 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.3035

***** 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	133.	22.67	0.99	9.036E-03	74.81	9.600	1.033E+00	PB212
77.27	298.	10.87	0.99	1.022E-02	77.11	17.500	1.147E+00	PB212
87.43	120.	38.86	1.50	1.472E-02	86.45	32.740	PBC<MDA	EU155
					88.04	3.790	1.486E+00	CD109
92.80	182.	24.37	0.88	1.645E-02	92.38	2.570	2.706E+00	TH234
					92.80	3.000	2.298E+00	TH234
186.32	206.	16.93	1.52	2.566E-02	185.99	3.280	1.575E+00	RA226
209.77	94.	36.69	0.98	2.469E-02				
238.83	1175.	3.47	1.09	2.319E-02	238.63	43.100	8.015E-01	PB212
241.69	170.	16.33	1.09	2.304E-02	241.00	3.900	1.302E+00	RA224
					241.92	7.470	6.814E-01	PB214
269.97	97.	30.81	1.08	2.153E-02				
295.43	345.	7.54	1.13	2.024E-02	295.22	19.200	6.040E-01	PB214
300.14	81.	25.50	1.13	2.001E-02				
327.98	63.	36.87	0.89	1.874E-02				
338.45	248.	12.73	1.23	1.830E-02	338.40	12.010	7.725E-01	AC228
352.13	595.	5.57	1.16	1.775E-02	351.99	37.100	6.163E-01	PB214
410.08	53.	40.05	1.19	1.573E-02				
463.53	115.	22.31	0.99	1.425E-02	463.51	10.000	5.492E-01	SB125
510.84	185.	12.18	1.39	1.317E-02	510.72	22.500	3.679E-01	TL208
583.37	437.	6.12	1.47	1.184E-02	583.14	86.000	2.924E-01	TL208
609.62	458.	5.40	1.30	1.143E-02	609.32	46.090	5.895E-01	BI214
727.52	69.	24.21	1.55	9.961E-03	727.17	11.800	4.013E-01	BI212
795.21	45.	26.20	1.50	9.301E-03	795.76	85.400	3.885E-02	CS134
860.86	47.	32.06	0.99	8.765E-03				
911.66	298.	7.52	1.34	8.397E-03	911.07	29.000	8.321E-01	AC228
965.08	65.	18.48	1.54	8.049E-03	964.00	14.580	3.809E-01	EU152

969.55	155.	9.73	1.54	8.022E-03	968.90	17.460	7.630E-01	AC228
1120.83	120.	14.14	1.87	7.209E-03	1120.28	15.040	7.500E-01	BI214
1238.57	63.	29.47	1.14	6.700E-03				
1461.53	1123.	3.10	1.92	5.930E-03	1460.75	10.700	1.198E+01	K40
1620.54	17.	32.77	0.78	5.488E-03	1620.56	2.750	7.693E-01	BI212
1765.37	87.	11.59	1.73	5.140E-03	1764.51	15.920	7.079E-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	
418.70	209.77	498.	94.	0.047	110.08	0.977	NP-239	
539.09	269.97	335.	97.	0.049	92.43	1.078	AC-228	s
599.33	300.09	245.	89.	0.045	84.27	0.909	PB-212	
655.09	327.98	220.	63.	0.032	110.62	0.889	AC-228	
819.29	410.08	159.	53.	0.026	120.14	1.193	AC-228	
1720.76	860.86	72.	47.	0.023	96.17	0.988	TL-208	s
1930.26	965.08	44.	62.	0.031	58.83	1.539	AC-228	D
2476.08	1238.57	88.	63.	0.032	88.40	1.141	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	395.	129.	0.064	68.96	0.993D
PB-212	153.39	77.11	377.	169.	0.084	4.35	0.995A
CD-109	174.04	87.43	1026.	120.	0.060	116.57	1.500
TH-234	185.44	93.13	1072.	129.	0.064	97.35	1.500s
TH-234	184.77	92.80	1063.	126.	0.063	98.71	1.500D
RA-226	371.80	186.32	491.	193.	0.096	50.79	1.519s
PB-212	476.75	238.80	635.	954.	0.477	15.20	0.968
RA-224	484.40	242.62	718.	131.	0.066	90.38	1.500
PB-214	482.47	241.66	440.	84.	0.042	110.89	0.905
PB-214	589.90	295.38	240.	343.	0.171	25.48	1.005s
AC-228	676.04	338.45	267.	247.	0.123	38.19	1.226
PB-214	703.41	352.13	207.	589.	0.295	16.70	1.156
SB-125	925.50	463.19	153.	80.	0.040	72.63	1.500s
TL-208	1020.80	510.84	156.	158.	0.079	36.53	1.393s
TL-208	1165.84	583.37	112.	432.	0.216	18.37	1.472
BI-214	1218.34	609.62	73.	451.	0.226	16.19	1.301
BI-212	1454.12	727.52	84.	69.	0.034	72.62	1.549
CS-134	1589.48	795.21	47.	45.	0.022	78.59	1.500s
AC-228	1822.35	911.66	74.	294.	0.147	22.57	1.339
EU-152	1929.71	965.35	91.	45.	0.023	98.37	1.538
AC-228	1936.81	968.90	42.	155.	0.077	29.91	1.541D
BI-214	2240.63	1120.83	58.	118.	0.059	42.43	1.867s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
K-40	2921.93	1461.53	44.	1104.	0.552	9.29	1.924
BI-212	3239.88	1620.54	5.	17.	0.008	98.31	0.775s
BI-214	3529.50	1765.37	8.	84.	0.042	34.76	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		-1.0548E-02					
			477.56	-1.055E-02	&(	3.328E-01 9.72E-02	G
K-40		1.1983E+01					
			1460.75	1.198E+01	(P	3.638E-01 3.78E-01	G
MN-54		-5.4099E-03					
			834.81	-5.410E-03	%(P	3.327E-02 9.65E-03	G
CO-57		-4.4101E-04					
			122.07	-4.410E-04	%(P	5.307E-02 1.58E-02	G K
			136.43	-4.695E-02	&	3.871E-01 1.16E-01	G
CO-60		-5.2914E-03					
			1332.51	-5.291E-03	%(P	3.820E-02 1.05E-02	G K
			1173.23	7.729E-03	% P	3.966E-02 1.15E-02	G K
Sr-85		-1.8402E-02					
			514.00	-1.840E-02	&(	4.487E-02 1.35E-02	G
Kr-85		-4.1472E+02					
			513.99	-4.147E+02	&(	1.011E+03 3.05E+02	G
Y-88		-8.8852E-05					
			1836.01	-8.885E-05	%(P	1.040E-02 1.41E-03	G K
			898.02	1.465E-02	& P	3.149E-02 9.51E-03	G
NB-94		-5.7991E-03					
			871.10	-5.799E-03	&(	3.394E-02 9.88E-03	G K
			702.50	-2.826E-03	&	3.199E-02 9.26E-03	G K
Ag-108M		-6.0549E-03					
			722.95	-6.055E-03	&(	3.948E-02 1.16E-02	G K
			614.37	3.649E-03	% P	2.917E-02 8.44E-03	G
			433.93	-2.886E-03	&	3.447E-02 1.01E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CD-109	1.4859E+00						
		88.04	1.486E+00	(	1.883E+00	5.77E-01	G
SN-113	-1.1625E-02						
		391.71	-1.163E-02	%(	4.944E-02	1.47E-02	G K
		255.04	-4.122E-01	%	1.539E+00	4.61E-01	G
SB-125	9.7544E-02						
		427.95	-5.725E-05	%(P	1.171E-01	3.43E-02	G K
		600.77	-3.317E-02	& P	1.651E-01	4.85E-02	G
		636.15	-4.508E-03	& P	2.504E-01	7.12E-02	G
		463.51	3.864E-01	@(P	2.926E-01	9.50E-02	G
		176.29	4.331E-02	%	5.630E-01	1.68E-01	G
I-131	-3.7367E-03						
		364.48	-3.737E-03	%(P	4.539E-02	1.33E-02	G K
		636.97	1.445E-01	%	4.500E-01	1.34E-01	G
		284.29	-9.178E-03	% P	6.219E-01	1.83E-01	G
CS-134	1.6099E-02						
		604.66	-3.812E-03	%(	3.392E-02	9.91E-03	G K
		795.76	3.885E-02	*(P	2.998E-02	1.02E-02	G
		569.29	1.851E-02	& P	1.556E-01	4.47E-02	G
		801.84	-4.890E-03	% P	4.535E-01	1.30E-01	G
CS-137	1.4178E-02						
		661.62	1.418E-02	%(P	3.658E-02	1.09E-02	G
CE-139	7.2401E-03						
		165.85	7.240E-03	%(	4.609E-02	1.38E-02	G
EU-152	7.8747E-02						
		121.78	-1.477E-02	%(P	1.467E-01	4.38E-02	G K
		344.30	2.689E-02	% P	1.114E-01	3.32E-02	G
		1408.08	4.961E-02	%	1.325E-01	3.93E-02	G
		964.00	2.663E-01	&(P	2.767E-01	8.84E-02	G
		1112.07	4.923E-02	%	2.908E-01	8.46E-02	G
		778.90	-6.086E-02	%	2.466E-01	7.26E-02	G
EU-154	1.3056E-02						
		123.10	1.306E-02	%(	1.097E-01	3.28E-02	G K
		1274.80	4.513E-02	%	1.023E-01	3.08E-02	G
		723.30	-4.144E-02	&	1.885E-01	5.57E-02	G
		1004.80	-3.522E-02	%	1.844E-01	5.35E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
EU-155	1.4301E-02						
		86.45	1.430E-02	&(	2.458E-01	7.35E-02	G K
		105.31	1.048E-01	%	2.329E-01	7.06E-02	G
HG-203	1.8163E-02						
		279.17	1.816E-02	%(P	3.923E-02	1.19E-02	G K
		72.87	-2.956E-01	& P	2.234E+00	6.69E-01	G
		70.83	1.107E-02	%	4.263E+00	1.27E+00	G
		82.50	-5.930E-01	%	3.706E+00	1.11E+00	G
TL-208	2.9243E-01						
		583.14	2.924E-01	(P	3.510E-02	1.81E-02	G
		510.72	3.679E-01	+ P	1.414E-01	5.24E-02	G
PB-212	6.5740E-01						
		238.63	6.574E-01	(P	8.274E-02	3.37E-02	G K
							Energy duplication
		77.11	6.574E-01	} P	3.628E-01	9.53E-03	G
		74.81	1.019E+00	+ P	7.560E-01	2.40E-01	G
PB-214	6.1310E-01						
		351.99	6.163E-01	(P	7.289E-02	3.47E-02	G K
		295.22	6.069E-01	@(P	1.328E-01	5.22E-02	G
							Energy duplication
		77.11	2.747E-02	} P	8.763E-01	2.27E-01	G
		241.92	3.364E-01	-	4.023E-01	1.24E-01	G
BI-212	4.7084E-01						
		727.17	4.013E-01	(P	2.668E-01	9.79E-02	G K
		1620.56	7.693E-01	*(P	6.061E-01	2.53E-01	G
		785.42	6.662E-01	%	1.682E+00	5.05E-01	G
BI-214	5.8947E-01						
		609.32	5.895E-01	(P	5.547E-02	3.23E-02	G K
		1764.51	7.079E-01	+ P	1.328E-01	8.53E-02	G
		1120.28	7.500E-01	+ P	2.424E-01	1.08E-01	G
RA-224	1.0058E+00						
		241.00	1.006E+00	(	9.764E-01	3.03E-01	G
RA-226	1.5753E+00						
		185.99	1.575E+00	*(P	8.674E-01	2.85E-01	G
AC-228	7.9874E-01						
		911.07	8.321E-01	(P	1.207E-01	6.33E-02	G K
		968.90	7.614E-01	(P	1.619E-01	7.60E-02	G
		338.40	7.725E-01	(P	2.473E-01	9.88E-02	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments

TH-227      -2.4617E-01
                          236.00-2.462E-01 %(  3.862E-01 1.18E-01 G K
                          256.25 1.571E-02 % P 3.281E-01 9.62E-02 G

PA-234       2.8955E-02
                           98.44 2.895E-02 &(P 2.240E-01 6.71E-02 G K
                          946.00-3.719E-02 % P 1.528E-01 4.47E-02 G
                          131.28-1.911E-04 % P 1.820E-01 5.41E-02 G
                           94.67-1.581E-01 % P 4.267E-01 1.29E-01 G
                          883.24-1.804E-03 %   2.624E-01 7.42E-02 G
                          926.70 1.462E-01 &   2.456E-01 7.60E-02 G
                          569.26-1.765E-02 & P 3.103E-01 8.93E-02 G

TH-234       1.2723E+00
                           63.29 3.429E-01 %(P 6.147E+00 1.83E+00 G K
                                                          Energy duplication
                           92.80 1.759E+00 *(P 2.158E+00 6.60E-01 G
                           92.38 2.115E+00 *(P 2.552E+00 7.80E-01 G

AM-241      -7.3115E-03
                           59.54-7.311E-03 %(P 1.058E+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

- -

***** 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	-1.0244E-02	-1.0548E-02	2.9161E-01	2.9161E-01	3.232E-01
K-40		1.1983E+01	1.1983E+01	1.1326E+00	1.3292E+00	
MN-54	#A	-5.3829E-03	-5.4099E-03	3.2059E-02	3.2061E-02	3.311E-02
CO-57	#B	-4.3847E-04	-4.4101E-04	9.5789E-02	9.5789E-02	5.276E-02
CO-60	#B	-5.2871E-03	-5.2914E-03	1.0670E-01	1.0670E-01	3.817E-02
Sr-85	#A	-1.7964E-02	-1.8402E-02	4.0630E-02	4.0644E-02	4.380E-02
Kr-85	#A	-4.1472E+02	-4.1472E+02	9.1569E+02	9.1600E+02	1.011E+03
Y-88	#B	-8.7561E-05	-8.8852E-05	5.3311E-04	5.3314E-04	1.025E-02
NB-94	#B	-5.7991E-03	-5.7991E-03	2.9653E-02	2.9655E-02	3.394E-02
Ag-108M	#B	-6.0547E-03	-6.0549E-03	3.4667E-02	3.4668E-02	3.947E-02
CD-109	#A	1.4808E+00	1.4859E+00	1.7321E+00	1.7341E+00	1.876E+00
SN-113	#B	-1.1469E-02	-1.1625E-02	4.4164E-02	4.4169E-02	4.877E-02
SB-125	#B	9.7394E-02	9.7544E-02	7.1976E-02	7.2198E-02	1.170E-01
I-131	#B	-3.0773E-03	-3.7367E-03	4.9831E-02	4.9832E-02	3.738E-02
CS-134	#B	1.6066E-02	1.6099E-02	1.2677E-02	1.2711E-02	3.385E-02
CS-137	#A	1.4176E-02	1.4178E-02	3.2826E-02	3.2836E-02	3.657E-02
CE-139	#A	7.1584E-03	7.2401E-03	4.1402E-02	4.1404E-02	4.557E-02
EU-152	#B	7.8721E-02	7.8747E-02	7.8396E-02	7.8517E-02	1.467E-01
EU-154	#B	1.3049E-02	1.3056E-02	9.8506E-02	9.8509E-02	1.096E-01
EU-155	#B	1.4289E-02	1.4301E-02	2.2055E-01	2.2055E-01	2.456E-01
HG-203	#B	1.7564E-02	1.8163E-02	3.5659E-02	3.5675E-02	3.794E-02
TL-208		2.9243E-01	2.9243E-01	5.4260E-02	5.6854E-02	
PB-212		6.5740E-01	6.5740E-01	1.0121E-01	1.0817E-01	
PB-214		6.1310E-01	6.1310E-01	9.4442E-02	1.0093E-01	
BI-212		4.7084E-01	4.7084E-01	2.8896E-01	2.9025E-01	
BI-214		5.8947E-01	5.8947E-01	9.6810E-02	1.0268E-01	
RA-224		1.0058E+00	1.0058E+00	9.0903E-01	9.1091E-01	9.764E-01
RA-226	#	1.5753E+00	1.5753E+00	8.5390E-01	8.5878E-01	
AC-228		7.9874E-01	7.9874E-01	1.4310E-01	1.5042E-01	
TH-227	#B	-2.4617E-01	-2.4617E-01	3.5348E-01	3.5377E-01	3.862E-01
PA-234	#B	2.8955E-02	2.8955E-02	2.0117E-01	2.0118E-01	2.240E-01
TH-234	#B	1.2723E+00	1.2723E+00	1.4084E+00	1.4102E+00	6.147E+00
AM-241	#A	-7.3114E-03	-7.3115E-03	1.5038E+00	1.5038E+00	1.058E+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) 1.7986029E+01 pCi/gm
Total Decayed Activity (1120.0 to 2000.7 keV) 1.7986032E+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_9AUG2006_1643.An1

Sample description
FSS-OOL-10-02-005-F

Spectrum Filename: C:\GammaVision\Spectra\103F_9AUG2006_1643.An1

Acquisition information
Start time: 09-Aug-2006 16:43:08
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: 1.5670E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.5670E+03) =
6.3816E+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	04-Aug-2006 13:15:00
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. 16 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.2774

***** 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	114.	21.38	0.99	9.052E-03	74.81	9.600	1.134E+00	PB212
77.16	108.	19.68	0.99	1.011E-02	77.11	17.500	7.349E-01	PB212
					77.11	10.700	1.202E+00	PB214
186.24	100.	34.95	0.90	2.566E-02	185.99	3.280	PBC<MDA	RA226
209.56	79.	35.03	1.09	2.470E-02				
238.87	909.	3.94	1.09	2.319E-02	238.63	43.100	7.741E-01	PB212
241.45	97.	31.24	1.09	2.305E-02	241.00	3.900	9.309E-01	RA224
					241.92	7.470	4.871E-01	PB214
270.31	76.	27.03	1.28	2.151E-02				
295.45	189.	10.77	1.13	2.024E-02	295.22	19.200	4.097E-01	PB214
299.85	49.	30.97	1.13	2.003E-02				
338.35	197.	14.70	1.09	1.830E-02	338.40	12.010	7.686E-01	AC228
352.02	366.	7.18	1.11	1.775E-02	351.99	37.100	4.713E-01	PB214
409.45	48.	40.05	0.96	1.575E-02				
462.69	119.	17.71	0.80	1.427E-02				
462.69	119.	17.71	0.80	1.427E-02	463.51	10.000	7.139E-01	SB125
511.20	173.	14.63	0.94	1.316E-02	510.72	22.500	4.269E-01	TL208
583.36	340.	7.98	1.28	1.184E-02	583.14	86.000	2.838E-01	TL208
609.60	264.	8.39	1.85	1.144E-02	609.32	46.090	4.212E-01	BI214
662.10	56.	19.76	1.35	1.071E-02	661.62	84.620	5.201E-02	CS137
666.24	27.	34.76	1.35	1.066E-02				
727.75	72.	22.32	1.42	9.959E-03	727.17	11.800	5.266E-01	BI212
795.52	43.	35.14	1.43	9.303E-03				
795.52	43.	35.14	1.43	9.303E-03	795.76	85.400	4.714E-02	CS134
911.69	232.	11.18	1.45	8.397E-03	911.07	29.000	8.093E-01	AC228
969.16	178.	11.44	1.39	8.024E-03	968.90	17.460	1.093E+00	AC228
1120.26	86.	20.91	1.72	7.212E-03	1120.28	15.040	6.663E-01	BI214

1461.52	1143.	3.03	1.86	5.930E-03	1460.75	10.700	1.527E+01	K40
1765.58	40.	19.26	2.39	5.142E-03	1764.51	15.920	4.249E-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	
418.29	209.56	316.	79.	0.040	105.10	1.089	AC-228	s
539.77	270.31	173.	76.	0.038	81.09	1.282	AC-228	
598.58	299.72	120.	49.	0.024	104.08	0.873	TH-227	M
818.03	409.45	125.	48.	0.024	120.16	0.956	AC-228	
924.51	462.69	155.	65.	0.033	89.15	0.799	CS-138	s
1021.52	511.20	244.	72.	0.036	99.23	0.940	TL-208	s
1331.57	666.35	32.	27.	0.014	104.28	1.355	SB-126	lD

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	259.	114.	0.057	64.15	0.993D
PB-212	153.39	77.11	268.	108.	0.054	59.03	0.995A
RA-226	371.97	186.40	568.	90.	0.045	101.56	1.500
PB-212	476.95	238.90	527.	857.	0.428	16.23	1.010
RA-224	482.85	241.85	547.	95.	0.047	109.25	1.500
PB-214	589.78	295.31	149.	184.	0.092	35.46	1.104
AC-228	675.84	338.35	215.	196.	0.098	44.11	1.093
PB-214	703.19	352.02	140.	360.	0.180	21.53	1.108
SB-125	925.63	463.25	113.	52.	0.026	93.01	1.500s
TL-208	1021.16	511.02	167.	93.	0.047	49.98	1.500s
TL-208	1166.01	583.46	108.	292.	0.146	22.73	1.500s
BI-214	1218.30	609.60	87.	258.	0.129	25.18	1.855s
CS-137	1323.50	662.21	105.	96.	0.048	68.26	1.102
BI-212	1454.57	727.75	70.	72.	0.036	66.97	1.420
CS-134	1590.13	795.54	63.	39.	0.019	99.30	1.500
AC-228	1822.40	911.69	101.	229.	0.114	33.55	1.447
AC-228	1937.33	969.16	71.	178.	0.089	34.31	1.394
BI-214	2239.48	1120.26	73.	84.	0.042	62.72	1.715s
K-40	2921.92	1461.52	32.	1124.	0.562	9.09	1.861
BI-214	3529.92	1765.58	10.	40.	0.020	57.77	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	MDA Value pCi/gm	COMMENTS
BE-7		1.2448E-01					
			477.56	1.245E-01	&(	3.470E-01 1.04E-01	G
K-40		1.5273E+01					
			1460.75	1.527E+01	(P	3.945E-01 4.71E-01	G
MN-54		-2.4888E-03					
			834.81	-2.489E-03	%(P	3.668E-02 1.04E-02	G
CO-57		-6.5070E-04					
			122.07	-6.507E-04	&(P	5.466E-02 1.62E-02	G K
			136.43	-1.362E-01	%	4.217E-01 1.27E-01	G
CO-60		1.6192E-03					
			1332.51	1.619E-03	%(P	2.937E-02 7.62E-03	G K
			1173.23	-3.429E-03	% P	5.157E-02 1.45E-02	G K
Sr-85		-1.2803E-02					
			514.00	-1.280E-02	&(	4.962E-02 1.48E-02	G
Kr-85		-2.7977E+02					
			513.99	-2.798E+02	&(	1.084E+03 3.23E+02	G
Y-88		-1.1336E-04					
			1836.01	-1.134E-04	&(P	1.327E-02 1.80E-03	G K
			898.02	4.902E-03	& P	3.767E-02 1.07E-02	G
NB-94		-6.4361E-03					
			871.10	-6.436E-03	%(	3.442E-02 9.95E-03	G K
			702.50	-1.221E-02	%	3.709E-02 1.10E-02	G K
Ag-108M		2.2999E-03					
			722.95	2.300E-03	&(	3.374E-02 9.57E-03	G K
			614.37	-4.966E-03	& P	4.264E-02 1.24E-02	G
			433.93	5.357E-04	%	3.442E-02 9.94E-03	G
CD-109		1.7290E-01					
			88.04	1.729E-01	%(	1.593E+00 4.74E-01	G
SN-113		-2.0957E-02					
			391.71	-2.096E-02	%(	6.285E-02 1.89E-02	G K
			255.04	2.392E-01	%	1.734E+00 5.15E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	9.2001E-02						
		427.95	1.561E-02	%(P	1.078E-01	3.16E-02	G K
		600.77	-1.601E-03	& P	1.749E-01	4.98E-02	G
		636.15	-3.419E-03	% P	3.361E-01	9.60E-02	G
		463.51	3.181E-01	*(P	3.171E-01	1.01E-01	G
		176.29	-5.849E-02	%	5.986E-01	1.78E-01	G
I-131	-8.8159E-04						
		364.48	-8.816E-04	%(P	5.772E-02	1.67E-02	G K
		636.97	-9.412E-02	%	8.220E-01	2.39E-01	G
		284.29	1.933E-02	& P	9.467E-01	2.79E-01	G
CS-134	1.9749E-02						
		604.66	0.000E+00	&(	6.587E-02	1.94E-02	G K
		795.76	4.232E-02	(P	4.345E-02	1.40E-02	G
		569.29	2.480E-02	& P	1.984E-01	5.71E-02	G
		801.84	-5.246E-03	& P	4.565E-01	1.29E-01	G
CS-137	9.1287E-02						
		661.62	9.129E-02	(P	4.797E-02	2.11E-02	G
CE-139	2.0738E-02						
		165.85	2.074E-02	&(	4.178E-02	1.27E-02	G
EU-152	-2.5455E-03						
		121.78	-2.546E-03	%(P	1.538E-01	4.56E-02	G K
		344.30	2.975E-03	& P	1.054E-01	3.06E-02	G
		1408.08	4.594E-02	%	1.300E-01	3.82E-02	G
		964.00	-1.202E-02	& P	4.289E-01	1.24E-01	G
		1112.07	-7.829E-02	&	4.412E-01	1.29E-01	G
		778.90	3.551E-03	%	2.218E-01	6.17E-02	G
EU-154	-1.4550E-03						
		123.10	-1.455E-03	&(	1.051E-01	3.12E-02	G K
		1274.80	-1.539E-02	%	1.276E-01	3.65E-02	G
		723.30	4.042E-02	&	1.861E-01	5.45E-02	G
		1004.80	-6.767E-02	%	2.297E-01	6.78E-02	G
EU-155	-4.8510E-02						
		86.45	-4.851E-02	%(	2.325E-01	6.97E-02	G K
		105.31	4.061E-02	%	2.476E-01	7.41E-02	G
HG-203	1.9690E-02						
		279.17	1.969E-02	&(P	4.250E-02	1.29E-02	G K
		72.87	-7.312E-01	& P	2.404E+00	7.23E-01	G
		70.83	0.000E+00	&	5.283E+00	1.57E+00	G
		82.50	-6.452E-01	&	3.236E+00	9.66E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	2.5247E-01						
		583.14	2.474E-01	@(P	4.336E-02	1.90E-02	G
		510.72	2.719E-01	*(P	1.830E-01	5.82E-02	G
PB-212	7.3783E-01						
		238.63	7.390E-01	(P	9.462E-02	4.06E-02	G K
							Energy duplication
		77.11	5.285E-01	} P	3.850E-01	1.04E-01	G
		74.81	1.134E+00	+ P	7.716E-01	2.49E-01	G
PB-214	4.4958E-01						
		351.99	4.713E-01	(P	7.575E-02	3.44E-02	G K
		295.22	4.076E-01	(P	1.323E-01	4.93E-02	G
							Energy duplication
		77.11	3.058E-01	} P	9.546E-01	2.25E-01	G
		241.92	3.591E-01	%	5.680E-01	1.74E-01	G
BI-212	5.2663E-01						
		727.17	5.266E-01	(P	3.062E-01	1.18E-01	G K
		1620.56	1.479E-01	% P	1.099E+00	3.01E-01	G
		785.42	7.799E-01	%	1.927E+00	5.79E-01	G
BI-214	4.2216E-01						
		609.32	4.212E-01	@(P	7.572E-02	3.62E-02	G K
		1764.51	4.249E-01	(P	1.812E-01	8.85E-02	G
		1120.28	6.663E-01	+ P	3.385E-01	1.42E-01	G
RA-224	9.0743E-01						
		241.00	9.074E-01	&(	1.071E+00	3.30E-01	G
RA-226	9.2154E-01						
		185.99	9.215E-01	(P	1.166E+00	3.57E-01	G
AC-228	7.9738E-01						
		911.07	8.093E-01	(P	1.757E-01	9.19E-02	G K
		968.90	1.093E+00	+ P	2.591E-01	1.25E-01	G
		338.40	7.686E-01	(P	2.788E-01	1.14E-01	G
TH-227	-1.5453E-01						
		236.00	-1.545E-01	&(	3.941E-01	1.19E-01	G K
		256.25	-1.975E-04	& P	5.156E-01	1.52E-01	G
PA-234	2.1408E-03						
		98.44	2.141E-03	%(P	2.451E-01	7.28E-02	G K
		946.00	3.198E-02	% P	1.782E-01	5.14E-02	G
		131.28	6.487E-02	& P	1.885E-01	5.68E-02	G
		94.67	-1.126E-01	% P	3.943E-01	1.18E-01	G
		883.24	9.954E-02	%	2.753E-01	8.19E-02	G
		926.70	-7.417E-02	&	3.630E-01	1.06E-01	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26 3.468E-02 & P 2.935E-01 8.44E-02 G

TH-234       2.4207E+00
                           63.29 2.421E+00 &(P 6.644E+00 2.00E+00 G K
                           92.80 1.266E+00 % P 2.230E+00 6.75E-01 G
                           92.38 1.429E+00 & P 2.654E+00 8.02E-01 G

AM-241       3.2753E-01
                           59.54 3.275E-01 %(P 1.067E+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	1.1644E-01	1.2448E-01	3.1186E-01	3.1195E-01	3.246E-01
K-40		1.5273E+01	1.5273E+01	1.4117E+00	1.6671E+00	
MN-54	#A	-2.4606E-03	-2.4888E-03	4.1342E-02	4.1342E-02	3.627E-02
CO-57	#B	-6.4217E-04	-6.5070E-04	8.8169E-02	8.8169E-02	5.395E-02
CO-60	#B	1.6162E-03	1.6192E-03	2.2852E-02	2.2852E-02	2.931E-02

Sr-85	#A	-1.2118E-02	-1.2803E-02	4.4364E-02	4.4371E-02	4.696E-02
Kr-85	#A	-2.7976E+02	-2.7977E+02	9.6941E+02	9.6955E+02	1.084E+03
Y-88	#B	-1.0963E-04	-1.1336E-04	6.8017E-04	6.8020E-04	1.283E-02
NB-94	#B	-6.4361E-03	-6.4361E-03	2.9863E-02	2.9865E-02	3.442E-02
Ag-108M	#B	2.2997E-03	2.2999E-03	2.8711E-02	2.8711E-02	3.373E-02
CD-109	#A	1.7155E-01	1.7290E-01	1.4209E+00	1.4209E+00	1.581E+00
SN-113	#B	-2.0318E-02	-2.0957E-02	5.6558E-02	5.6571E-02	6.093E-02
SB-125	#B	9.1678E-02	9.2001E-02	8.7657E-02	8.7819E-02	1.075E-01
I-131	#B	-5.6578E-04	-8.8159E-04	3.3991E-01	3.3991E-01	3.704E-02
CS-134	#B	1.9655E-02	1.9749E-02	1.9655E-02	1.9688E-02	6.556E-02
CS-137		9.1257E-02	9.1287E-02	6.3209E-02	6.3431E-02	
CE-139	#A	2.0208E-02	2.0738E-02	3.8046E-02	3.8065E-02	4.071E-02
EU-152	#B	-2.5435E-03	-2.5455E-03	3.8258E-01	3.8258E-01	1.537E-01
EU-154	#B	-1.4533E-03	-1.4550E-03	9.3509E-02	9.3509E-02	1.050E-01
EU-155	#B	-4.8415E-02	-4.8510E-02	2.0899E-01	2.0901E-01	2.320E-01
HG-203	#B	1.8239E-02	1.9690E-02	3.8623E-02	3.8640E-02	3.937E-02
TL-208	#	2.5247E-01	2.5247E-01	5.8226E-02	6.0043E-02	4.336E-02
PB-212		7.3783E-01	7.3783E-01	1.2140E-01	1.2873E-01	
PB-214		4.4958E-01	4.4958E-01	9.5144E-02	9.8659E-02	
BI-212		5.2663E-01	5.2663E-01	3.5511E-01	3.5643E-01	
BI-214		4.2216E-01	4.2216E-01	1.0895E-01	1.1167E-01	
RA-224	#A	9.0743E-01	9.0743E-01	9.9136E-01	9.9276E-01	1.071E+00
RA-226	#A	9.2153E-01	9.2154E-01	1.0707E+00	1.0721E+00	1.166E+00
AC-228		7.9738E-01	7.9738E-01	2.2292E-01	2.2767E-01	
TH-227	#B	-1.5453E-01	-1.5453E-01	3.5719E-01	3.5730E-01	3.941E-01
PA-234	#B	2.1408E-03	2.1408E-03	2.1851E-01	2.1851E-01	2.451E-01
TH-234	#B	2.4207E+00	2.4207E+00	5.9973E+00	5.9988E+00	6.644E+00
AM-241	#A	3.2752E-01	3.2753E-01	9.6119E-01	9.6136E-01	1.067E+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) 1.8297375E+01 pCi/gm
Total Decayed Activity (86.4 to 2000.7 keV) 1.8297403E+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_9AUG2006_1720.An1

Sample description
FSS-OOL-10-02-020-F

Spectrum Filename: C:\GammaVision\Spectra\103F_9AUG2006_1720.An1

Acquisition information

Start time:	09-Aug-2006 17:20:13
Live time:	2000
Real time:	2003
Dead time:	0.13 %
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:	1.8700E+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	04-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. 16 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.3366

***** 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	143.	21.74	0.99	9.052E-03	72.87	6.400	PBC<MDA	HG203
					74.81	9.600	1.187E+00	PB212
77.23	248.	12.59	0.99	1.011E-02	77.11	17.500	1.089E+00	PB212
93.25	100.	39.66	1.14	1.660E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
129.05	139.	32.74	0.96	2.437E-02				
186.59	152.	25.89	1.34	2.565E-02	185.99	3.280	1.196E+00	RA226
209.30	162.	24.61	1.00	2.471E-02				
238.85	1644.	2.83	1.09	2.319E-02	238.63	43.100	1.179E+00	PB212
270.30	148.	24.60	1.34	2.151E-02				
277.69	62.	36.99	0.79	2.113E-02				
277.69	62.	36.99	0.79	2.113E-02	279.17	81.500	PBC<MDA	HG203
295.35	234.	13.96	1.20	2.024E-02	295.22	19.200	4.274E-01	PB214
300.48	88.	32.27	0.84	1.999E-02				
328.24	102.	23.01	1.28	1.873E-02				
338.55	310.	8.93	1.20	1.829E-02	338.40	12.010	1.014E+00	AC228
352.14	440.	8.00	1.12	1.775E-02	351.99	37.100	4.761E-01	PB214
464.01	118.	21.24	1.18	1.423E-02	463.51	10.000	5.963E-01	SB125
510.81	241.	13.40	1.19	1.317E-02	510.72	22.500	5.221E-01	TL208
583.51	508.	6.50	1.29	1.184E-02	583.14	86.000	3.576E-01	TL208
609.53	359.	8.05	1.35	1.144E-02	609.32	46.090	4.828E-01	BI214
727.70	170.	15.47	1.36	9.959E-03	727.17	11.800	1.044E+00	BI212
786.64	70.	28.00	1.64	9.394E-03	785.42	2.000	2.708E+00	BI212
795.11	65.	22.22	0.91	9.307E-03				
795.11	65.	22.22	0.91	9.307E-03	795.76	85.400	5.898E-02	CS134
860.29	88.	19.14	0.89	8.770E-03				
911.62	356.	7.24	1.89	8.398E-03	911.07	29.000	1.047E+00	AC228

965.25	68.	20.29	1.54	8.048E-03				
969.51	196.	8.72	1.54	8.022E-03	968.90	17.460	1.008E+00	AC228
1121.11	125.	17.72	1.67	7.208E-03	1120.28	15.040	8.175E-01	BI214
1461.60	1564.	2.57	1.83	5.929E-03	1460.75	10.700	1.759E+01	K40
1589.72	64.	20.99	1.58	5.568E-03				
1622.40	22.	32.78	0.63	5.488E-03	1620.56	2.750	1.051E+00	BI212
1765.48	63.	13.72	2.40	5.142E-03	1764.51	15.920	5.555E-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
257.26	129.05	791.	153.	0.076	81.72	0.962	AC-228 s
417.75	209.30	595.	162.	0.081	73.84	1.003	AC-228
483.09	241.90	316.	144.	0.072	57.93	1.095	PB-214 lD
539.74	270.30	437.	148.	0.074	73.81	1.336	AC-228 s
600.10	300.48	309.	88.	0.044	96.82	0.839	PB-212
655.62	328.24	212.	102.	0.051	69.02	1.276	AC-228 s
1719.62	860.29	66.	88.	0.044	57.41	0.895	TL-208 s
1930.64	965.28	70.	58.	0.029	73.36	1.539	AC-228 D
3178.27	1589.72	23.	64.	0.032	62.98	1.584	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	432.	143.	0.071	65.21	0.993D
PB-212	153.39	77.11	440.	248.	0.124	37.78	0.995A
TH-234	185.33	93.08	1154.	131.	0.066	99.11	1.500s
TH-234	185.35	93.09	1151.	127.	0.063	101.86	1.500s
RA-226	372.33	186.59	623.	139.	0.070	77.67	1.336s
PB-212	476.86	238.85	828.	1602.	0.801	11.48	1.021
HG-203	554.60	277.72	343.	70.	0.035	117.15	1.500s
PB-214	589.85	295.35	337.	230.	0.115	41.87	1.195
AC-228	676.25	338.55	207.	309.	0.154	26.78	1.200
PB-214	703.42	352.14	290.	434.	0.217	23.99	1.118
SB-125	925.69	463.28	196.	73.	0.036	87.26	1.500s
TL-208	1020.74	510.81	262.	214.	0.107	40.19	1.185s
TL-208	1166.13	583.51	187.	504.	0.252	19.51	1.286
BI-214	1218.17	609.53	160.	352.	0.176	24.15	1.352
BI-212	1454.31	727.62	162.	188.	0.094	44.07	1.371
BI-212	1572.33	786.64	94.	70.	0.035	84.01	1.642s
CS-134	1590.13	795.54	38.	62.	0.031	57.06	1.500s
AC-228	1822.27	911.62	100.	353.	0.176	21.73	1.889s
AC-228	1936.81	968.90	51.	196.	0.098	26.48	1.541D
BI-214	2241.20	1121.11	88.	123.	0.061	53.16	1.670s
K-40	2922.06	1461.60	35.	1545.	0.773	7.71	1.834

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
BI-212	3243.61	1622.40	10.	22.	0.011	98.33	0.632s
BI-214	3529.71	1765.48	8.	63.	0.031	41.17	2.400s

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		-1.1433E-01					
			477.56	-1.143E-01	%(	3.251E-01 9.74E-02	G
K-40		1.7592E+01					
			1460.75	1.759E+01	(P	3.439E-01 4.58E-01	G
MN-54		-8.3797E-03					
			834.81	-8.380E-03	&(P	3.784E-02 1.11E-02	G
CO-57		5.0490E-03					
			122.07	5.049E-03	%(P	5.392E-02 1.61E-02	G K
			136.43	9.880E-02	&	4.195E-01 1.26E-01	G
CO-60		-9.5329E-03					
			1332.51	-9.533E-03	&(P	4.370E-02 1.23E-02	G K
			1173.23	7.693E-03	% P	4.664E-02 1.35E-02	G K
Sr-85		-1.4886E-02					
			514.00	-1.489E-02	%(	4.828E-02 1.45E-02	G
Kr-85		-3.2460E+02					
			513.99	-3.246E+02	%(	1.054E+03 3.16E+02	G
Y-88		-1.4213E-03					
			1836.01	-1.421E-03	%(P	2.710E-02 7.11E-03	G K
			898.02	-5.740E-03	% P	4.213E-02 1.22E-02	G
NB-94		6.3609E-03					
			871.10	6.361E-03	&(	3.511E-02 1.02E-02	G K
			702.50	3.501E-04	&	3.530E-02 1.01E-02	G K
Ag-108M		1.9549E-04					
			722.95	1.955E-04	&(	3.882E-02 1.11E-02	G K
			614.37	-7.578E-03	% P	4.348E-02 1.28E-02	G
			433.93	-6.794E-03	%	3.766E-02 1.12E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CD-109	-9.7287E-02						
		88.04	-9.729E-02	%(	2.244E+00	6.71E-01	G
SN-113	7.9683E-03						
		391.71	7.968E-03	%(	5.272E-02	1.56E-02	G K
		255.04	8.583E-02	&	1.697E+00	5.03E-01	G
SB-125	1.2163E-01						
		427.95	3.769E-02	%(P	1.000E-01	3.00E-02	G K
		600.77	-2.909E-03	& P	1.829E-01	5.28E-02	G
		636.15	-6.129E-02	& P	3.210E-01	9.42E-02	G
		463.51	3.701E-01	*(P	3.457E-01	1.10E-01	G
		176.29	-8.304E-02	%	6.285E-01	1.88E-01	G
I-131	3.0825E-04						
		364.48	3.083E-04	%(P	6.286E-02	1.84E-02	G K
		636.97	1.389E-01	&	7.607E-01	2.24E-01	G
		284.29	-1.403E-01	% P	8.964E-01	2.67E-01	G
CS-134	3.0338E-02						
		604.66	7.478E-03	&(	3.089E-02	9.11E-03	G K
		795.76	5.646E-02	(P	2.886E-02	1.08E-02	G
		569.29	6.078E-02	& P	2.102E-01	6.23E-02	G
		801.84	-1.759E-02	% P	3.673E-01	1.03E-01	G
CS-137	-7.2883E-04						
		661.62	-7.288E-04	&(P	4.630E-02	1.33E-02	G
CE-139	-4.6838E-03						
		165.85	-4.684E-03	%(	4.679E-02	1.40E-02	G
EU-152	1.4114E-02						
		121.78	1.411E-02	%(P	1.562E-01	4.67E-02	G K
		344.30	3.138E-02	% P	1.264E-01	3.78E-02	G
		1408.08	-7.586E-03	%	1.669E-01	4.65E-02	G
		964.00	3.455E-02	% P	3.213E-01	9.35E-02	G
		1112.07	-3.432E-02	%	3.139E-01	9.06E-02	G
		778.90	1.088E-03	%	2.309E-01	6.53E-02	G
EU-154	2.7895E-02						
		123.10	2.790E-02	&(	1.144E-01	3.44E-02	G K
		1274.80	-3.428E-02	%	1.413E-01	4.16E-02	G
		723.30	7.814E-03	&	3.965E-01	1.17E-01	G
		1004.80	-2.116E-02	&	2.342E-01	6.76E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
EU-155	1.2825E-01						
		86.45	1.283E-01	%(	2.602E-01	7.90E-02	G K
		105.31	8.527E-02	&	2.198E-01	6.64E-02	G
HG-203	3.2080E-02						
		279.17	3.208E-02	&(P	4.057E-02	1.25E-02	G K
		72.87	-3.473E-01	% P	2.603E+00	7.81E-01	G
		70.83	0.000E+00	%	5.448E+00	1.63E+00	G
		82.50	0.000E+00	&	4.720E+00	1.41E+00	G
TL-208	3.5761E-01						
		583.14	3.576E-01	(P	4.712E-02	2.35E-02	G
		510.72	5.221E-01	+ P	1.905E-01	7.87E-02	G
PB-212	1.1446E+00						
		238.63	1.158E+00	(P	9.887E-02	4.47E-02	G K
							Energy duplication
		77.11	1.011E+00	} P	4.103E-01	1.27E-01	G
		74.81	1.187E+00	(P	8.283E-01	2.64E-01	G
PB-214	4.5953E-01						
		351.99	4.761E-01	(P	9.005E-02	3.86E-02	G K
		295.22	4.274E-01	(P	1.641E-01	6.07E-02	G
							Energy duplication
		77.11	0.000E+00	} P	9.512E-01	0.00E+00	G
		241.92	1.868E-01	%	6.049E-01	1.82E-01	G
BI-212	1.1373E+00						
		727.17	1.157E+00	(P	3.808E-01	1.71E-01	G K
		1620.56	1.051E+00	(P	8.370E-01	3.46E-01	G
		785.42	2.708E+00	+	1.838E+00	7.59E-01	G
BI-214	5.0146E-01						
		609.32	4.828E-01	(P	8.445E-02	3.96E-02	G K
		1764.51	5.555E-01	@(P	1.408E-01	8.02E-02	G
		1120.28	8.175E-01	+ P	3.098E-01	1.47E-01	G
RA-224	7.2238E-01						
		241.00	7.224E-01	%(	1.182E+00	3.60E-01	G
RA-226	1.1961E+00						
		185.99	1.196E+00	(P	1.021E+00	3.39E-01	G
AC-228	1.0286E+00						
		911.07	1.047E+00	(P	1.464E-01	7.66E-02	G K
		968.90	1.008E+00	(P	1.863E-01	8.91E-02	G
		338.40	1.014E+00	(P	2.296E-01	9.09E-02	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments

TH-227      -1.3923E-01
                          236.00-1.392E-01 %(  3.954E-01 1.19E-01 G K
                          256.25-6.901E-02 & P 5.091E-01 1.52E-01 G

PA-234      -6.4594E-03
                           98.44-6.459E-03 %(P 2.409E-01 7.18E-02 G K
                          946.00-3.627E-02 % P 1.978E-01 5.78E-02 G
                          131.28-6.476E-02 % P 2.352E-01 7.08E-02 G
                           94.67 1.941E-02 % P 4.441E-01 1.33E-01 G
                          883.24 3.421E-03 %   3.004E-01 8.55E-02 G
                          926.70 0.000E+00 &   3.716E-01 1.06E-01 G
                          569.26 9.002E-02 & P 3.104E-01 9.20E-02 G

TH-234       1.7862E+00
                           63.29 1.415E+00 %(P 6.970E+00 2.09E+00 G K
                           92.80 1.859E+00 *(P 2.354E+00 7.19E-01 G
                           92.38 2.265E+00 *(P 2.777E+00 8.49E-01 G

AM-241       7.6626E-03
                           59.54 7.663E-03 &(P 1.311E+00 3.91E-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	-1.0678E-01	-1.1433E-01	2.9230E-01	2.9238E-01	3.036E-01
K-40		1.7592E+01	1.7592E+01	1.3735E+00	1.7116E+00	
MN-54	#A	-8.2824E-03	-8.3797E-03	3.5682E-02	3.5685E-02	3.740E-02
CO-57	#B	4.9812E-03	5.0490E-03	4.8358E-02	4.8359E-02	5.320E-02
CO-60	#B	-9.5148E-03	-9.5329E-03	7.1373E-02	7.1375E-02	4.362E-02
Sr-85	#A	-1.4071E-02	-1.4886E-02	4.3423E-02	4.3431E-02	4.564E-02
Kr-85	#A	-3.2458E+02	-3.2460E+02	9.4754E+02	9.4773E+02	1.054E+03
Y-88	#B	-1.3735E-03	-1.4213E-03	2.4371E-02	2.4371E-02	2.619E-02
NB-94	#B	6.3609E-03	6.3609E-03	3.0699E-02	3.0701E-02	3.511E-02
Ag-108M	#B	1.9547E-04	1.9549E-04	3.3397E-02	3.3397E-02	3.882E-02
CD-109	#A	-9.6507E-02	-9.7287E-02	2.0136E+00	2.0136E+00	2.226E+00
SN-113	#B	7.7197E-03	7.9683E-03	4.6793E-02	4.6795E-02	5.108E-02
SB-125	#F	1.2119E-01	1.2163E-01	1.0799E-01	1.0822E-01	9.964E-02
I-131	#B	1.9580E-04	3.0825E-04	5.5217E-02	5.5217E-02	3.993E-02
CS-134	#B	3.0191E-02	3.0338E-02	1.7334E-02	1.7423E-02	3.074E-02
CS-137	#A	-7.2859E-04	-7.2883E-04	1.9477E-01	1.9477E-01	4.628E-02
CE-139	#A	-4.5612E-03	-4.6838E-03	4.1903E-02	4.1903E-02	4.557E-02
EU-152	#B	1.4102E-02	1.4114E-02	1.4003E-01	1.4004E-01	1.561E-01
EU-154	#B	2.7862E-02	2.7895E-02	1.0321E-01	1.0322E-01	1.143E-01
EU-155	#B	1.2799E-01	1.2825E-01	2.3685E-01	2.3696E-01	2.596E-01
HG-203	#A	2.9664E-02	3.2080E-02	3.7602E-02	3.7648E-02	3.751E-02
TL-208		3.5761E-01	3.5761E-01	7.0352E-02	7.3352E-02	
PB-212		1.1446E+00	1.1446E+00	1.3243E-01	1.4816E-01	
PB-214		4.5953E-01	4.5953E-01	1.1168E-01	1.1482E-01	
BI-212		1.1373E+00	1.1373E+00	5.0248E-01	5.0680E-01	
BI-214		5.0146E-01	5.0146E-01	1.2334E-01	1.2673E-01	
RA-224	#A	7.2238E-01	7.2238E-01	1.0805E+00	1.0813E+00	1.182E+00
RA-226		1.1961E+00	1.1961E+00	1.0154E+00	1.0177E+00	
AC-228		1.0286E+00	1.0286E+00	1.4967E-01	1.6114E-01	
TH-227	#B	-1.3923E-01	-1.3923E-01	3.5807E-01	3.5816E-01	3.954E-01
PA-234	#B	-6.4594E-03	-6.4594E-03	3.5281E-01	3.5281E-01	2.409E-01
TH-234	#B	1.7862E+00	1.7862E+00	2.0081E+00	2.0106E+00	6.970E+00
AM-241	#A	7.6624E-03	7.6626E-03	1.1723E+00	1.1723E+00	1.311E+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) 2.3417347E+01 pCi/gm
Total Decayed Activity (1120.0 to 2000.7 keV) 2.3417355E+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_9AUG2006_1758.An1

Sample description
FSS-OOL-10-02-017-F

Spectrum Filename: C:\GammaVision\Spectra\103F_9AUG2006_1758.An1

Acquisition information

Start time:	09-Aug-2006 17:58:53
Live time:	2000
Real time:	2001
Dead time:	0.04 %
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:	9.0500E+02
Activity scaling factor:	1.0000E+06/(1.0000E+00* 9.0500E+02) = 1.1050E+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	04-Aug-2006 12:50:00
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. 10 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.2974

***** 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
76.51	77.	32.10	0.83	9.839E-03	72.87	6.400	2.356E+00	HG203
					77.11	17.500	6.226E-01	PB212
					77.11	10.700	1.018E+00	PB214
185.95	71.	36.39	1.11	2.567E-02				
185.95	71.	36.39	1.11	2.567E-02	185.99	3.280	PBC<MDA	RA226
209.32	66.	33.30	0.72	2.471E-02				
238.85	299.	6.92	1.09	2.318E-02	238.63	43.100	4.286E-01	PB212
242.06	79.	19.48	1.10	2.301E-02	241.00	3.900	1.316E+00	RA224
					241.92	7.470	6.886E-01	PB214
295.39	94.	17.45	1.33	2.024E-02	295.22	19.200	3.447E-01	PB214
300.46	33.	35.47	1.38	2.000E-02				
338.65	71.	20.53	0.96	1.829E-02	338.40	12.010	4.763E-01	AC228
352.04	152.	12.12	1.10	1.775E-02	351.99	37.100	3.318E-01	PB214
583.64	114.	13.76	1.57	1.184E-02	583.14	86.000	1.608E-01	TL208
609.68	143.	13.44	1.27	1.143E-02	609.32	46.090	3.867E-01	BI214
661.91	202.	8.74	1.23	1.072E-02	661.62	84.620	3.309E-01	CS137
727.75	56.	22.81	0.89	9.959E-03	727.17	11.800	7.023E-01	BI212
911.74	69.	15.21	1.33	8.397E-03	911.07	29.000	3.998E-01	AC228
968.75	72.	17.48	1.44	8.027E-03				
968.75	72.	17.48	1.44	8.027E-03	968.90	17.460	7.614E-01	AC228
1461.57	410.	5.07	2.18	5.930E-03	1460.75	10.700	9.210E+00	K40
1765.39	14.	28.58	2.03	5.142E-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

152.19	76.51	221.	77.	0.038	96.29	0.829	BI-207	l
417.80	209.32	170.	66.	0.033	99.89	0.723	AC-228	s

Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM	Suspected	
600.06	300.46	52.	33.	0.016	106.41	1.379	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	476.97	238.91	292.	247.	0.123	36.99	0.939
RA-224	483.10	241.97	160.	89.	0.044	68.35	1.500
PB-214	483.09	241.96	172.	85.	0.042	73.10	1.500
PB-214	589.94	295.39	83.	90.	0.045	52.36	1.335
AC-228	676.23	338.55	90.	66.	0.033	69.52	1.500s
PB-214	703.21	352.04	81.	146.	0.073	36.37	1.101s
TL-208	1166.22	583.56	30.	97.	0.049	36.59	1.500s
BI-214	1218.41	609.66	41.	117.	0.058	33.81	1.500s
CS-137	1322.90	661.91	41.	201.	0.101	26.23	1.227
BI-212	1454.58	727.75	33.	55.	0.028	68.44	0.892s
AC-228	1822.37	911.67	20.	56.	0.028	48.82	1.505
AC-228	1937.81	969.40	27.	38.	0.019	75.30	1.541s
K-40	2922.02	1461.57	25.	391.	0.196	15.22	2.177
BI-214	3529.53	1765.39	6.	14.	0.007	85.75	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	Peak MDA Value pCi/gm	COMMENTS
BE-7		-3.0404E-02					
			477.56	-3.040E-02	%(	3.839E-01 1.09E-01	G
K-40		9.2097E+00					
			1460.75	9.210E+00	(P	6.066E-01 4.90E-01	G
MN-54		2.3929E-03					
			834.81	2.393E-03	&(P	4.186E-02 1.15E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CO-57	6.2758E-03						
		122.07	6.276E-03	&(P	5.862E-02	1.73E-02	G K
		136.43	-4.860E-02	%	4.631E-01	1.37E-01	G
CO-60	1.7296E-02						
		1332.51	1.730E-02	%(P	5.352E-02	1.52E-02	G K
		1173.23	-1.081E-02	% P	5.315E-02	1.42E-02	G K
Sr-85	-1.7760E-02						
		514.00	-1.776E-02	&(	6.379E-02	1.89E-02	G
Kr-85	-3.8781E+02						
		513.99	-3.878E+02	&(	1.393E+03	4.14E+02	G
Y-88	-2.7643E-03						
		1836.01	-2.764E-03	%(P	5.004E-02	1.29E-02	G K
		898.02	-2.710E-03	% P	4.085E-02	1.07E-02	G
NB-94	1.1994E-03						
		871.10	1.199E-03	%(	3.801E-02	1.02E-02	G K
		702.50	1.415E-02	&	3.630E-02	1.08E-02	G K
Ag-108M	1.4825E-02						
		722.95	1.483E-02	&(	4.238E-02	1.25E-02	G K
		614.37	-6.495E-05	& P	4.455E-02	1.23E-02	G
		433.93	1.141E-04	%	4.464E-02	1.26E-02	G
CD-109	5.9072E-01						
		88.04	5.907E-01	%(	2.239E+00	6.69E-01	G
SN-113	-1.5665E-03						
		391.71	-1.567E-03	%(	6.591E-02	1.89E-02	G K
		255.04	3.049E-01	&	1.665E+00	4.88E-01	G
SB-125	1.4954E-02						
		427.95	1.495E-02	%(P	1.455E-01	4.20E-02	G K
		600.77	-5.061E-02	% P	2.027E-01	5.88E-02	G
		636.15	-4.138E-02	& P	3.936E-01	1.11E-01	G
		463.51	2.870E-01	% P	4.172E-01	1.30E-01	G
		176.29	-1.954E-02	&	7.001E-01	2.05E-01	G
I-131	1.1937E-02						
		364.48	1.194E-02	%(P	6.598E-02	1.91E-02	G K
		636.97	-1.453E-01	%	9.570E-01	2.74E-01	G
		284.29	1.031E-01	% P	9.286E-01	2.70E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CS-134	5.7967E-04						
		604.66	5.797E-04	&(	4.549E-02	1.27E-02	G K
		795.76	1.486E-02	& P	3.543E-02	1.06E-02	G
		569.29	-1.192E-02	& P	2.730E-01	7.49E-02	G
		801.84	-7.876E-02	% P	4.400E-01	1.17E-01	G
CS-137	3.3092E-01						
		661.62	3.309E-01	(P	5.358E-02	2.91E-02	G
CE-139	6.2306E-05						
		165.85	6.231E-05	%(	5.323E-02	1.55E-02	G
EU-152	1.6811E-02						
		121.78	1.681E-02	&(P	1.653E-01	4.87E-02	G K
		344.30	3.152E-03	% P	1.511E-01	4.34E-02	G
		1408.08	0.000E+00	%	1.882E-01	4.76E-02	G
		964.00	1.357E-01	% P	3.280E-01	9.78E-02	G
		1112.07	5.332E-02	&	4.039E-01	1.14E-01	G
		778.90	3.516E-03	%	3.082E-01	8.38E-02	G
EU-154	2.1478E-02						
		123.10	2.148E-02	%(	1.199E-01	3.56E-02	G K
		1274.80	1.613E-03	&	1.071E-01	2.74E-02	G
		723.30	6.422E-02	&	2.029E-01	5.96E-02	G
		1004.80	-3.838E-02	%	2.968E-01	8.37E-02	G
EU-155	-1.3199E-03						
		86.45	-1.320E-03	&(	2.835E-01	8.34E-02	G K
		105.31	-2.053E-02	&	2.687E-01	7.92E-02	G
HG-203	3.0059E-02						
		279.17	3.006E-02	&(P	4.778E-02	1.47E-02	G K
		72.87	-1.529E-01	% P	2.339E+00	6.86E-01	G
		70.83	-4.398E-01	&	5.230E+00	1.54E+00	G
		82.50	-3.891E-01	&	4.632E+00	1.37E+00	G
TL-208	1.4281E-01						
		583.14	1.428E-01	(P	4.165E-02	1.82E-02	G
		510.72	1.651E-02	% P	2.428E-01	6.51E-02	G
PB-212	4.0497E-01						
		238.63	3.682E-01	(P	1.231E-01	4.76E-02	G K
							Energy duplication
		77.11	2.935E-01	} P	4.281E-01	1.33E-01	G
		74.81	3.645E-01	% P	1.365E+00	4.07E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
PB-214	3.3621E-01						
		351.99	3.318E-01	@(P	1.010E-01	4.18E-02	G K
		295.22	3.447E-01	(P	1.737E-01	6.29E-02	G
							Energy duplication
		77.11	2.512E-01	} P	9.778E-01	2.44E-01	G
		241.92	7.379E-01	+	5.541E-01	1.80E-01	G
BI-212	7.0233E-01						
		727.17	7.023E-01	(P	3.728E-01	1.62E-01	G K
		1620.56	1.336E-01	& P	1.417E+00	3.67E-01	G
		785.42	-4.016E-03	%	2.417E+00	6.68E-01	G
BI-214	3.3100E-01						
		609.32	3.310E-01	@(P	9.261E-02	3.94E-02	G K
		1764.51	2.467E-01	- P	2.645E-01	8.76E-02	G
		1120.28	1.765E-01	% P	4.044E-01	1.20E-01	G
RA-224	1.4741E+00						
		241.00	1.474E+00	&(	1.024E+00	3.36E-01	G
RA-226	9.4985E-01						
		185.99	9.498E-01	%(P	1.334E+00	4.06E-01	G
AC-228	3.8342E-01						
		911.07	3.427E-01	(P	1.452E-01	5.91E-02	G K
		968.90	4.044E-01	*(P	2.860E-01	1.02E-01	G
		338.40	4.511E-01	@(P	3.182E-01	1.06E-01	G
TH-227	-1.5278E-02						
		236.00	-1.528E-02	%(	3.354E-01	9.75E-02	G K
		256.25	3.525E-02	% P	5.746E-01	1.67E-01	G
PA-234	4.1544E-02						
		98.44	4.154E-02	%(P	2.528E-01	7.49E-02	G K
		946.00	3.838E-02	% P	2.111E-01	5.96E-02	G
		131.28	-4.503E-02	& P	2.447E-01	7.26E-02	G
		94.67	-7.924E-03	% P	4.688E-01	1.38E-01	G
		883.24	-5.331E-02	&	3.622E-01	1.02E-01	G
		926.70	2.871E-04	%	3.695E-01	9.87E-02	G
		569.26	-1.617E-02	& P	4.026E-01	1.10E-01	G
TH-234	-1.1149E+00						
		63.29	-1.115E+00	%(P	7.195E+00	2.09E+00	G K
		92.80	1.128E+00	% P	2.502E+00	7.46E-01	G
		92.38	1.408E+00	% P	2.963E+00	8.86E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
AM-241	1.9874E-01						
		59.54	1.987E-01	%(P	1.074E+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	

- -

***** 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	-2.8415E-02	-3.0404E-02	3.2672E-01	3.2673E-01	3.588E-01
K-40		9.2097E+00	9.2097E+00	1.4683E+00	1.5626E+00	
MN-54	#A	2.3654E-03	2.3929E-03	3.4351E-02	3.4352E-02	4.138E-02
CO-57	#B	6.1924E-03	6.2758E-03	5.1900E-02	5.1901E-02	5.784E-02
CO-60	#B	1.7263E-02	1.7296E-02	4.5561E-02	4.5572E-02	5.342E-02
Sr-85	#A	-1.6797E-02	-1.7760E-02	5.6820E-02	5.6829E-02	6.034E-02
Kr-85	#A	-3.8779E+02	-3.8781E+02	1.2407E+03	1.2409E+03	1.393E+03
Y-88	#B	-2.6722E-03	-2.7643E-03	4.4578E-02	4.4578E-02	4.837E-02
NB-94	#B	1.1994E-03	1.1994E-03	3.0670E-02	3.0670E-02	3.801E-02
Ag-108M	#B	1.4824E-02	1.4825E-02	3.7568E-02	3.7578E-02	4.238E-02
CD-109	#A	5.8603E-01	5.9072E-01	2.0080E+00	2.0082E+00	2.221E+00

SN-113	#B	-1.5181E-03	-1.5665E-03	5.6556E-02	5.6556E-02	6.387E-02
SB-125	#B	1.4901E-02	1.4954E-02	1.2599E-01	1.2599E-01	1.449E-01
I-131	#B	7.6149E-03	1.1937E-02	5.7385E-02	5.7389E-02	4.209E-02
CS-134	#B	5.7690E-04	5.7967E-04	3.8208E-02	3.8208E-02	4.527E-02
CS-137		3.3081E-01	3.3092E-01	8.7416E-02	8.9503E-02	
CE-139	#A	6.0689E-05	6.2306E-05	4.6649E-02	4.6649E-02	5.185E-02
EU-152	#B	1.6798E-02	1.6811E-02	1.4606E-01	1.4607E-01	1.651E-01
EU-154	#B	2.1453E-02	2.1478E-02	1.0674E-01	1.0674E-01	1.198E-01
EU-155	#B	-1.3173E-03	-1.3199E-03	2.5016E-01	2.5016E-01	2.829E-01
HG-203	#B	2.7815E-02	3.0059E-02	4.4157E-02	4.4192E-02	4.421E-02
TL-208	#	1.4281E-01	1.4281E-01	5.4565E-02	5.5191E-02	4.165E-02
PB-212		4.0497E-01	4.0497E-01	1.5707E-01	1.5882E-01	
PB-214		3.3621E-01	3.3621E-01	1.1178E-01	1.1347E-01	
BI-212		7.0233E-01	7.0233E-01	4.8499E-01	4.8670E-01	
BI-214	#	3.3100E-01	3.3100E-01	1.1811E-01	1.1966E-01	9.261E-02
RA-224	#	1.4741E+00	1.4741E+00	1.0075E+00	1.0111E+00	1.024E+00
RA-226	#A	9.4984E-01	9.4985E-01	1.2186E+00	1.2198E+00	1.334E+00
AC-228	#	3.8342E-01	3.8342E-01	1.4787E-01	1.4954E-01	1.452E-01
TH-227	#B	-1.5278E-02	-1.5278E-02	2.9263E-01	2.9263E-01	3.354E-01
PA-234	#B	4.1544E-02	4.1544E-02	2.2460E-01	2.2462E-01	2.528E-01
TH-234	#B	-1.1149E+00	-1.1149E+00	1.7102E+01	1.7103E+01	7.195E+00
AM-241	#A	1.9873E-01	1.9874E-01	9.5009E-01	9.5016E-01	1.074E+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 (92.9 to 2000.7 keV) 1.0983986E+01 pCi/gm
Total Decayed Activity (92.9 to 2000.7 keV) 1.0984095E+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_14AUG2006_1128.An1

Sample description
FSS-OOL-10-02-025-F-I

Spectrum Filename: C:\GammaVision\Spectra\103F_14AUG2006_1128.An1

Acquisition information
Start time: 14-Aug-2006 11:28:58
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: 1.4950E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.4950E+03) =
6.6890E+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	10-Aug-2006 07:10:00
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. 17 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.0650

***** 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	117.	21.81	0.99	9.052E-03	74.81	9.600	1.222E+00	PB212
77.16	160.	13.54	0.99	1.011E-02	77.11	17.500	1.016E+00	PB212
					77.11	10.700	1.662E+00	PB214
86.93	81.	31.57	1.00	1.422E-02	86.45	32.740	1.585E-01	EU155
					88.04	3.790	1.318E+00	CD109
90.09	67.	38.31	1.00	1.542E-02				
93.65	77.	34.45	1.00	1.668E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
185.52	165.	21.13	1.05	2.568E-02				
185.52	165.	21.13	1.05	2.568E-02	185.99	3.280	1.628E+00	RA226
209.30	108.	31.60	0.93	2.471E-02				
238.73	1011.	3.63	1.09	2.320E-02	238.63	43.100	9.036E-01	PB212
241.86	107.	20.59	1.10	2.303E-02	241.00	3.900	1.078E+00	RA224
270.41	71.	31.58	1.51	2.150E-02				
295.27	223.	11.65	1.09	2.025E-02	295.22	19.200	5.100E-01	PB214
300.34	54.	34.84	1.09	2.000E-02				
328.55	73.	28.52	1.05	1.872E-02				
338.52	216.	13.16	0.92	1.830E-02	338.40	12.010	8.826E-01	AC228
351.99	368.	7.71	1.00	1.775E-02	351.99	37.100	4.973E-01	PB214
410.27	52.	33.16	1.18	1.572E-02				
462.89	78.	26.50	1.15	1.426E-02				
462.89	78.	26.50	1.15	1.426E-02	463.51	10.000	4.850E-01	SB125
511.09	181.	14.31	1.59	1.316E-02	510.72	22.500	4.707E-01	TL208
583.16	293.	8.56	1.29	1.184E-02	583.14	86.000	2.563E-01	TL208
609.42	272.	8.65	1.15	1.144E-02	609.32	46.090	4.552E-01	BI214
662.01	41.	41.22	0.88	1.072E-02	661.62	84.620	PBC<MDA	CS137
727.06	88.	19.36	1.36	9.966E-03	727.17	11.800	6.719E-01	BI212

795.03	32.	32.12	1.50	9.301E-03	795.76	85.400	3.668E-02	CS134
911.24	203.	8.17	1.28	8.400E-03	911.07	29.000	7.392E-01	AC228
968.76	140.	13.74	1.62	8.027E-03	968.90	17.460	8.989E-01	AC228
1120.08	76.	24.96	1.33	7.213E-03	1120.28	15.040	6.209E-01	BI214
1407.11	18.	36.83	1.81	6.096E-03	1408.08	21.210	PBC<MDA	EU152
1460.82	1091.	3.17	1.98	5.932E-03	1460.75	10.700	1.527E+01	K40
1764.54	59.	12.70	0.90	5.142E-03	1764.51	15.920	6.485E-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
173.04	86.75	285.	81.	0.040	94.71	1.001	BI-207 lD
179.36	89.91	294.	67.	0.033	114.93	1.003	PB-214 lD
417.76	209.30	410.	108.	0.054	94.80	0.935	AC-228
482.87	241.79	191.	107.	0.054	61.77	1.095	PB-214 lD
539.97	270.41	207.	71.	0.036	94.73	1.510	AC-228 s
599.83	300.34	150.	54.	0.027	104.53	1.085	PB-212
656.24	328.55	159.	73.	0.037	85.56	1.049	RH-106M s
819.67	410.27	105.	52.	0.026	99.48	1.180	EU-152 s
1323.10	662.01	90.	41.	0.020	123.65	0.885	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	148.79	74.81	289.	117.	0.059	65.42	0.993D
PB-212	153.39	77.11	280.	160.	0.080	40.61	0.995A
TH-234	185.56	93.20	726.	95.	0.048	104.03	1.500s
TH-234	185.54	93.18	715.	96.	0.048	102.26	1.500s
RA-226	371.62	186.23	604.	111.	0.056	87.38	1.500s
PB-212	476.57	238.71	576.	929.	0.464	15.83	1.047
PB-214	589.69	295.27	202.	219.	0.110	34.96	1.088
AC-228	676.18	338.52	204.	215.	0.107	39.47	0.924s
PB-214	703.11	351.99	174.	362.	0.181	23.13	1.004
SB-125	925.12	463.00	114.	76.	0.038	67.68	1.500
TL-208	1021.30	511.09	171.	154.	0.077	42.92	1.592s
TL-208	1165.41	583.16	120.	289.	0.144	25.67	1.286
BI-214	1217.93	609.42	100.	266.	0.133	25.96	1.155
BI-212	1453.18	727.06	66.	87.	0.044	58.09	1.355
CS-134	1589.12	795.03	37.	32.	0.016	96.35	1.500
AC-228	1821.50	911.24	36.	199.	0.100	24.51	1.279
AC-228	1936.53	968.76	74.	139.	0.070	41.22	1.617
BI-214	2239.13	1120.08	77.	75.	0.037	74.88	1.335
EU-152	2813.11	1407.11	13.	18.	0.009	110.49	1.812s
K-40	2920.51	1460.82	41.	1072.	0.536	9.51	1.981
BI-214	3527.84	1764.54	3.	59.	0.029	38.10	0.900s

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		1.3299E-01					
			477.56	1.330E-01	%(	3.525E-01 1.06E-01	G
K-40		1.5268E+01					
			1460.75	1.527E+01	(P	4.631E-01 4.92E-01	G
MN-54		7.1895E-04					
			834.81	7.189E-04	%(P	4.706E-02 1.35E-02	G
CO-57		1.3693E-02					
			122.07	1.369E-02	%(P	5.557E-02 1.67E-02	G K
			136.43	-1.857E-02	%	4.312E-01 1.28E-01	G
CO-60		7.2255E-03					
			1332.51	7.225E-03	&(P	4.131E-02 1.16E-02	G K
			1173.23	1.079E-02	& P	5.276E-02 1.53E-02	G K
Sr-85		-8.2392E-03					
			514.00	-8.239E-03	%(	4.857E-02 1.44E-02	G
Kr-85		-1.8189E+02					
			513.99	-1.819E+02	%(	1.072E+03 3.17E+02	G
Y-88		-1.1808E-04					
			1836.01	-1.181E-04	%(P	1.382E-02 1.88E-03	G K
			898.02	1.781E-04	% P	4.165E-02 1.17E-02	G
NB-94		-5.9522E-03					
			871.10	-5.952E-03	%(	4.073E-02 1.18E-02	G K
			702.50	9.764E-05	&	3.748E-02 1.07E-02	G K
Ag-108M		-2.0075E-02					
			722.95	-2.008E-02	%(	5.391E-02 1.62E-02	G K
			614.37	-1.466E-02	% P	4.595E-02 1.37E-02	G
			433.93	2.180E-03	%	3.550E-02 1.03E-02	G
CD-109		5.7639E-01					
			88.04	5.764E-01	&(	2.076E+00 6.24E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SN-113	-5.0771E-03						
		391.71	-5.077E-03	%(	5.837E-02	1.71E-02	G K
		255.04	1.646E-01	&	1.780E+00	5.27E-01	G
SB-125	1.2209E-01						
		427.95	2.076E-04	&(P	1.053E-01	3.03E-02	G K
		600.77	5.302E-02	% P	1.941E-01	5.74E-02	G
		636.15	-3.657E-02	& P	3.044E-01	8.74E-02	G
		463.51	4.829E-01	(P	3.341E-01	1.11E-01	G
		176.29	4.698E-02	&	5.847E-01	1.74E-01	G
I-131	9.7842E-03						
		364.48	9.784E-03	&(P	5.006E-02	1.47E-02	G K
		636.97	-1.191E-01	&	7.931E-01	2.32E-01	G
		284.29	6.429E-02	% P	7.837E-01	2.31E-01	G
CS-134	1.2710E-02						
		604.66	-8.259E-03	%(	4.395E-02	1.29E-02	G K
		795.76	3.668E-02	(P	3.567E-02	1.18E-02	G
		569.29	-3.572E-02	% P	2.053E-01	5.88E-02	G
		801.84	-3.984E-03	% P	3.937E-01	1.09E-01	G
CS-137	2.2907E-02						
		661.62	2.291E-02	%(P	4.888E-02	1.48E-02	G
CE-139	-1.1080E-02						
		165.85	-1.108E-02	%(	5.427E-02	1.63E-02	G
EU-152	7.5915E-02						
		121.78	3.872E-02	%(P	1.614E-01	4.84E-02	G K
		344.30	-1.471E-02	& P	1.245E-01	3.66E-02	G
		1408.08	1.272E-01	(	1.380E-01	4.68E-02	G
		964.00	2.127E-01	% P	3.433E-01	1.06E-01	G
		1112.07	-5.006E-02	&	3.323E-01	9.57E-02	G
		778.90	-1.144E-01	%	3.250E-01	9.70E-02	G
EU-154	3.1503E-02						
		123.10	3.150E-02	&(	1.124E-01	3.38E-02	G K
		1274.80	6.376E-02	%	8.207E-02	2.68E-02	G
		723.30	5.949E-03	%	2.048E-01	5.86E-02	G
		1004.80	7.271E-02	%	1.917E-01	5.71E-02	G
EU-155	1.7706E-01						
		86.45	1.771E-01	%(	2.468E-01	7.56E-02	G K
		105.31	8.002E-02	%	2.584E-01	7.78E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
HG-203	-4.7238E-03						
		279.17	-4.724E-03	%(P	4.842E-02	1.43E-02	G K
		72.87	-1.279E+00	% P	2.598E+00	7.88E-01	G
		70.83	2.293E-01	&	5.091E+00	1.52E+00	G
		82.50	-4.295E-01	&	3.447E+00	1.03E+00	G
TL-208	2.5627E-01						
		583.14	2.563E-01	(P	4.774E-02	2.23E-02	G
		510.72	4.707E-01	+ P	1.939E-01	7.90E-02	G
PB-212	8.3952E-01						
		238.63	8.395E-01	(P	1.036E-01	4.49E-02	G K
							Energy duplication
		77.11	8.147E-01	} P	4.120E-01	1.10E-01	G
		74.81	1.222E+00	+ P	8.516E-01	2.74E-01	G
PB-214	5.0163E-01						
		351.99	4.973E-01	(P	8.799E-02	3.89E-02	G K
		295.22	5.100E-01	(P	1.602E-01	6.05E-02	G
							Energy duplication
		77.11	9.825E-02	} P	1.000E+00	2.47E-01	G
		241.92	-1.249E-03	%	4.570E-01	1.34E-01	G
BI-212	6.7192E-01						
		727.17	6.719E-01	(P	3.110E-01	1.31E-01	G K
		1620.56	2.723E-01	% P	1.071E+00	3.04E-01	G
		785.42	3.766E-01	%	2.172E+00	6.34E-01	G
BI-214	4.5523E-01						
		609.32	4.552E-01	(P	8.473E-02	4.04E-02	G K
		1764.51	6.485E-01	+ P	1.230E-01	8.70E-02	G
		1120.28	6.209E-01	+ P	3.644E-01	1.59E-01	G
RA-224	7.8171E-01						
		241.00	7.817E-01	%(	1.128E+00	3.46E-01	G
RA-226	1.1928E+00						
		185.99	1.193E+00	*(P	1.258E+00	3.88E-01	G
AC-228	8.1633E-01						
		911.07	7.392E-01	(P	1.135E-01	6.14E-02	G K
		968.90	8.989E-01	(P	2.754E-01	1.24E-01	G
		338.40	8.826E-01	@(P	2.851E-01	1.17E-01	G
TH-227	-1.1408E-01						
		236.00	-1.141E-01	%(	4.392E-01	1.32E-01	G K
		256.25	4.287E-02	% P	5.273E-01	1.56E-01	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments

PA-234       5.8890E-02
                            98.44 5.889E-02 %(P 2.493E-01 7.48E-02 G K
                           946.00-2.536E-02 % P 2.022E-01 5.80E-02 G
                           131.28-7.125E-02 % P 2.422E-01 7.29E-02 G
                            94.67 3.914E-02 & P 3.261E-01 9.68E-02 G
                           883.24 0.000E+00 &   3.885E-01 1.11E-01 G
                           926.70-3.756E-03 %   2.702E-01 7.41E-02 G
                           569.26-3.682E-03 % P 2.899E-01 8.14E-02 G

TH-234       1.5482E+00
                            63.29 1.051E+00 %(P 7.066E+00 2.10E+00 G K
                            92.80 1.764E+00 *(P 2.332E+00 7.11E-01 G
                            92.38 2.052E+00 &(P 2.766E+00 8.43E-01 G

AM-241       1.2563E-03
                            59.54 1.256E-03 %(P 1.263E+00 3.74E-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	1.2596E-01	1.3299E-01	3.1728E-01	3.1738E-01	3.339E-01
K-40		1.5268E+01	1.5268E+01	1.4770E+00	1.7225E+00	
MN-54	#A	7.1230E-04	7.1895E-04	4.0374E-02	4.0374E-02	4.662E-02
CO-57	#B	1.3547E-02	1.3693E-02	5.0023E-02	5.0028E-02	5.497E-02
CO-60	#B	7.2146E-03	7.2255E-03	3.4739E-02	3.4741E-02	4.125E-02
Sr-85	#A	-7.8791E-03	-8.2392E-03	4.3060E-02	4.3062E-02	4.645E-02
Kr-85	#A	-1.8189E+02	-1.8189E+02	9.5065E+02	9.5071E+02	1.072E+03
Y-88	#B	-1.1491E-04	-1.1808E-04	7.0847E-04	7.0850E-04	1.345E-02
NB-94	#B	-5.9522E-03	-5.9522E-03	3.5310E-02	3.5312E-02	4.073E-02
Ag-108M	#B	-2.0074E-02	-2.0075E-02	4.8513E-02	4.8527E-02	5.390E-02
CD-109	#A	5.7272E-01	5.7639E-01	1.8726E+00	1.8728E+00	2.063E+00
SN-113	#B	-4.9509E-03	-5.0771E-03	5.1356E-02	5.1356E-02	5.692E-02
SB-125	#F	1.2174E-01	1.2209E-01	8.4017E-02	8.4315E-02	1.050E-01
I-131	#B	6.8238E-03	9.7842E-03	4.4167E-02	4.4170E-02	3.491E-02
CS-134	#B	1.2662E-02	1.2710E-02	1.2279E-02	1.2301E-02	4.378E-02
CS-137	#A	2.2901E-02	2.2907E-02	4.4282E-02	4.4302E-02	4.887E-02
CE-139	#A	-1.0849E-02	-1.1080E-02	4.8771E-02	4.8775E-02	5.314E-02
EU-152	#B	7.5868E-02	7.5915E-02	8.3875E-02	8.3981E-02	1.613E-01
EU-154	#B	3.1473E-02	3.1503E-02	1.0129E-01	1.0131E-01	1.123E-01
EU-155	#B	1.7678E-01	1.7706E-01	2.2687E-01	2.2709E-01	2.464E-01
HG-203	#B	-4.4390E-03	-4.7238E-03	4.3372E-02	4.3372E-02	4.550E-02
TL-208		2.5627E-01	2.5627E-01	6.6776E-02	6.8414E-02	
PB-212		8.3952E-01	8.3952E-01	1.3464E-01	1.4319E-01	
PB-214		5.0163E-01	5.0163E-01	1.0699E-01	1.1089E-01	
BI-212		6.7192E-01	6.7192E-01	3.9254E-01	3.9447E-01	
BI-214		4.5523E-01	4.5523E-01	1.2106E-01	1.2391E-01	
RA-224	#A	7.8171E-01	7.8171E-01	1.0372E+00	1.0382E+00	1.128E+00
RA-226	#A	1.1928E+00	1.1928E+00	1.1638E+00	1.1658E+00	1.258E+00
AC-228		8.1633E-01	8.1633E-01	1.6987E-01	1.7636E-01	
TH-227	#B	-1.1408E-01	-1.1408E-01	3.9582E-01	3.9587E-01	4.392E-01
PA-234	#B	5.8890E-02	5.8890E-02	2.2436E-01	2.2439E-01	2.493E-01
TH-234	#B	1.5482E+00	1.5482E+00	1.8734E+00	1.8754E+00	7.066E+00
AM-241	#A	1.2563E-03	1.2563E-03	1.1228E+00	1.1228E+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

YAEC Chemistry Lab Spectrum name: 103F_14AUG2006_1128.An1

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

Total Activity (86.4 to 2000.7 keV) 1.8808424E+01 pCi/gm
Total Decayed Activity (86.4 to 2000.7 keV) 1.8808424E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JJM

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

Sample description
FSS-OOL-10-02-023-F-I

Spectrum Filename: C:\GammaVision\Spectra\103F_14AUG2006_1714.An1

Acquisition information

Start time:	14-Aug-2006 17:14:47
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:	1.1550E+03
Activity scaling factor:	1.0000E+06/(1.0000E+00* 1.1550E+03) = 8.6580E+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-Aug-2006 16:30:00
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. 15 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.0986

***** 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	94.	22.94	0.99	9.052E-03	74.81	9.600	1.271E+00	PB212
77.22	128.	15.16	0.99	1.011E-02	77.11	17.500	9.512E-01	PB212
92.43	110.	29.75	1.13	1.632E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
186.47	130.	21.70	1.05	2.565E-02	185.99	3.280	1.628E+00	RA226
238.75	759.	4.17	1.09	2.320E-02	238.63	43.100	8.737E-01	PB212
241.71	102.	24.94	1.09	2.304E-02	241.00	3.900	1.327E+00	RA224
					241.92	7.470	6.944E-01	PB214
277.17	52.	35.19	0.97	2.115E-02				
295.21	170.	14.12	1.25	2.025E-02	295.22	19.200	5.009E-01	PB214
300.23	60.	30.21	1.04	2.001E-02				
338.40	148.	16.01	1.13	1.830E-02	338.40	12.010	7.820E-01	AC228
352.04	315.	9.32	1.12	1.775E-02	351.99	37.100	5.503E-01	PB214
463.13	63.	29.20	1.04	1.426E-02				
463.13	63.	29.20	1.04	1.426E-02	463.51	10.000	5.087E-01	SB125
510.71	129.	19.58	1.25	1.317E-02	510.72	22.500	4.024E-01	TL208
583.37	224.	8.97	1.14	1.184E-02	583.14	86.000	2.520E-01	TL208
609.30	235.	10.17	1.58	1.144E-02	609.32	46.090	5.080E-01	BI214
661.75	32.	36.22	1.50	1.072E-02	661.62	84.620	PBC<MDA	CS137
727.40	46.	27.71	1.50	9.965E-03	727.17	11.800	4.607E-01	BI212
796.09	50.	31.42	1.08	9.298E-03	795.76	85.400	7.460E-02	CS134
911.36	161.	8.92	1.85	8.399E-03	911.07	29.000	7.589E-01	AC228
968.14	133.	12.69	1.66	8.030E-03	968.90	17.460	1.109E+00	AC228
1120.59	60.	30.77	1.57	7.210E-03	1120.28	15.040	6.268E-01	BI214
1461.09	882.	3.54	1.93	5.931E-03	1460.75	10.700	1.592E+01	K40
1764.47	38.	15.62	1.42	5.142E-03	1764.51	15.920	5.393E-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	
482.58	241.52	273.	102.	0.051	74.82	1.095	PB-214	lD
553.48	277.17	131.	59.	0.029	91.70	0.965	TL-208	
599.61	300.23	121.	60.	0.030	90.64	1.043	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	148.79	74.81	205.	94.	0.047	68.81	0.993D
PB-212	153.39	77.11	218.	128.	0.064	45.47	0.995A
RA-226	372.10	186.47	303.	117.	0.059	65.09	1.051s
PB-212	476.72	238.78	430.	725.	0.363	17.37	1.060
PB-214	589.56	295.21	168.	166.	0.083	42.35	1.246
AC-228	675.94	338.40	154.	147.	0.073	48.02	1.129
PB-214	703.23	352.04	177.	310.	0.155	27.97	1.121
SB-125	925.08	462.98	90.	46.	0.023	95.09	1.500s
TL-208	1020.53	510.71	167.	102.	0.051	58.74	1.255s
TL-208	1165.84	583.37	71.	219.	0.110	26.91	1.143
BI-214	1217.70	609.30	112.	229.	0.114	30.51	1.582
CS-137	1322.59	661.75	57.	32.	0.016	108.66	1.500
BI-212	1453.88	727.40	61.	46.	0.023	83.12	1.500s
CS-134	1589.11	795.03	44.	28.	0.014	114.43	1.500s
AC-228	1821.76	911.36	21.	158.	0.079	26.75	1.845s
AC-228	1935.29	968.14	46.	133.	0.066	38.07	1.660s
BI-214	2240.14	1120.59	80.	58.	0.029	92.30	1.573
K-40	2921.04	1461.09	38.	864.	0.432	10.63	1.926
BI-214	3527.70	1764.47	3.	38.	0.019	46.85	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		1.1195E-01					
			477.56	1.120E-01	&(	3.931E-01 1.16E-01	G
K-40		1.5922E+01					
			1460.75	1.592E+01	(P	5.810E-01 5.77E-01	G
MN-54		2.6567E-02					
			834.81	2.657E-02	%(P	3.700E-02 1.17E-02	G
CO-57		3.7353E-04					
			122.07	3.735E-04	%(P	6.756E-02 2.00E-02	G K
			136.43	-1.675E-01	%	4.733E-01 1.43E-01	G
CO-60		1.2180E-02					
			1332.51	1.218E-02	%(P	4.671E-02 1.32E-02	G K
			1173.23	2.133E-02	% P	5.886E-02 1.74E-02	G K
Sr-85		-8.8535E-03					
			514.00	-8.854E-03	%(	5.734E-02 1.69E-02	G
Kr-85		-1.9335E+02					
			513.99	-1.933E+02	%(	1.255E+03 3.69E+02	G
Y-88		-2.5652E-03					
			1836.01	-2.565E-03	%(P	3.378E-02 8.55E-03	G K
			898.02	-2.288E-03	% P	4.855E-02 1.35E-02	G
NB-94		1.7108E-04					
			871.10	1.711E-04	%(	4.223E-02 1.17E-02	G K
			702.50	6.453E-03	&	4.715E-02 1.36E-02	G K
Ag-108M		-1.1147E-02					
			722.95	-1.115E-02	&(	6.437E-02 1.89E-02	G K
			614.37	-4.436E-02	& P	6.296E-02 1.95E-02	G
			433.93	0.000E+00	%	4.250E-02 1.22E-02	G
CD-109		-1.3685E-03					
			88.04	-1.368E-03	%(	2.148E+00 6.35E-01	G
SN-113		-7.5937E-04					
			391.71	-7.594E-04	%(	6.749E-02 1.96E-02	G K
			255.04	9.535E-02	%	2.070E+00 6.09E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	1.1968E-01						
		427.95	3.193E-02	%(P	7.645E-02	2.29E-02	G K
		600.77	5.461E-02	% P	1.992E-01	5.85E-02	G
		636.15	-3.853E-03	& P	3.357E-01	9.36E-02	G
		463.51	3.794E-01	*(P	3.868E-01	1.24E-01	G
		176.29	1.125E-01	%	6.779E-01	2.02E-01	G
I-131	6.5245E-04						
		364.48	6.524E-04	%(P	5.918E-02	1.69E-02	G K
		636.97	-1.783E-01	%	9.075E-01	2.65E-01	G
		284.29	-2.363E-01	% P	9.858E-01	2.93E-01	G
CS-134	1.9462E-02						
		604.66	0.000E+00	&(	9.899E-02	2.92E-02	G K
		795.76	4.170E-02	@(P	4.980E-02	1.60E-02	G
		569.29	7.161E-02	& P	2.737E-01	8.03E-02	G
		801.84	-1.074E-01	% P	5.461E-01	1.55E-01	G
CS-137	4.1112E-02						
		661.62	4.111E-02	(P	4.900E-02	1.55E-02	G
CE-139	8.9774E-03						
		165.85	8.977E-03	%(	5.723E-02	1.70E-02	G
EU-152	1.8594E-04						
		121.78	1.859E-04	%(P	1.906E-01	5.64E-02	G K
		344.30	-2.295E-02	% P	1.554E-01	4.58E-02	G
		1408.08	0.000E+00	%	2.225E-01	6.01E-02	G
		964.00	6.953E-02	% P	2.560E-01	7.39E-02	G
		1112.07	5.962E-03	%	3.952E-01	1.10E-01	G
		778.90	-1.893E-03	%	3.554E-01	1.00E-01	G
EU-154	1.5888E-02						
		123.10	1.589E-02	%(	1.297E-01	3.86E-02	G K
		1274.80	-3.367E-02	&	1.829E-01	5.30E-02	G
		723.30	-5.179E-02	&	2.945E-01	8.63E-02	G
		1004.80	4.316E-02	%	1.588E-01	4.54E-02	G
EU-155	1.4854E-01						
		86.45	1.485E-01	%(	2.931E-01	8.90E-02	G K
		105.31	-8.861E-02	%	2.810E-01	8.45E-02	G
HG-203	-9.9105E-03						
		279.17	-9.910E-03	&(P	5.573E-02	1.65E-02	G K
		72.87	-8.627E-01	& P	2.918E+00	8.77E-01	G
		70.83	-1.190E+00	&	5.561E+00	1.66E+00	G
		82.50	-1.225E+00	%	4.820E+00	1.45E+00	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments

TL-208       2.5199E-01
                          583.14 2.520E-01  (P 4.809E-02 2.31E-02 G
                          510.72 4.024E-01 + P 2.485E-01 9.95E-02 G

PB-212       8.7842E-01
                          238.63 8.489E-01  (P 1.162E-01 5.00E-02 G K
                                                          Energy duplication
                           77.11 8.457E-01 } P 4.728E-01 1.28E-01 G
                           74.81 1.271E+00 + P 9.339E-01 3.01E-01 G

PB-214       5.3343E-01
                          351.99 5.503E-01  (P 1.150E-01 5.22E-02 G K
                          295.22 5.009E-01  (P 1.897E-01 7.24E-02 G
                                                          Energy duplication
                           77.11 0.000E+00 } P 1.077E+00 0.00E+00 G
                          241.92 1.640E-02 %   8.414E-01 2.50E-01 G

BI-212       4.6069E-01
                          727.17 4.607E-01 *(P 3.895E-01 1.29E-01 G K
                         1620.56 3.868E-01 % P 1.092E+00 3.18E-01 G
                          785.42 3.214E-01 %   2.501E+00 7.22E-01 G

BI-214       5.3766E-01
                          609.32 5.080E-01  (P 1.155E-01 5.31E-02 G K
                         1764.51 5.393E-01  (P 1.592E-01 9.15E-02 G
                         1120.28 6.268E-01  (P 4.785E-01 1.99E-01 G

RA-224       9.6802E-01
                          241.00 9.680E-01 %(  1.382E+00 4.24E-01 G

RA-226       1.6281E+00
                          185.99 1.628E+00 *(P 1.165E+00 3.93E-01 G

AC-228       7.6567E-01
                          911.07 7.589E-01  (P 1.155E-01 6.91E-02 G K
                          968.90 1.109E+00 + P 2.869E-01 1.41E-01 G
                          338.40 7.820E-01  (P 3.224E-01 1.26E-01 G

TH-227       5.8009E-02
                          236.00 5.801E-02 %(  4.012E-01 1.19E-01 G K
                          256.25 8.371E-03 % P 5.673E-01 1.66E-01 G

PA-234       3.1506E-02
                           98.44 3.151E-02 %(P 2.789E-01 8.30E-02 G K
                          946.00-5.430E-02 & P 2.606E-01 7.58E-02 G
                          131.28-1.543E-02 % P 2.598E-01 7.71E-02 G
                           94.67-1.823E-01 % P 5.226E-01 1.57E-01 G
                          883.24 1.372E-02 %   3.322E-01 9.23E-02 G
                          926.70 0.000E+00 %   4.742E-01 1.33E-01 G
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 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26 1.078E-01 & P 4.030E-01 1.18E-01 G

TH-234       3.9211E+00
                           63.29 3.921E+00 &(P 7.559E+00 2.29E+00 G K
                           92.80 1.812E+00 % P 2.515E+00 7.66E-01 G
                           92.38 2.067E+00 % P 3.079E+00 9.35E-01 G

AM-241      -4.3019E-01
                           59.54-4.302E-01 %(P 1.524E+00 4.57E-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:                      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	1.0488E-01	1.1195E-01	3.4920E-01	3.4926E-01	3.683E-01
K-40		1.5922E+01	1.5922E+01	1.7294E+00	1.9610E+00	
MN-54	#A	2.6272E-02	2.6567E-02	3.5158E-02	3.5192E-02	3.659E-02
CO-57	#B	3.6874E-04	3.7353E-04	6.0061E-02	6.0061E-02	6.670E-02
CO-60	#B	1.2158E-02	1.2180E-02	3.9534E-02	3.9540E-02	4.662E-02

Sr-85	#A	-8.3899E-03	-8.8535E-03	5.0620E-02	5.0623E-02	5.434E-02
Kr-85	#A	-1.9334E+02	-1.9335E+02	1.1074E+03	1.1074E+03	1.254E+03
Y-88	#B	-2.4827E-03	-2.5652E-03	2.8925E-02	2.8925E-02	3.270E-02
NB-94	#B	1.7108E-04	1.7108E-04	3.5153E-02	3.5153E-02	4.223E-02
Ag-108M	#B	-1.1146E-02	-1.1147E-02	5.6575E-02	5.6578E-02	6.436E-02
CD-109	#A	-1.3580E-03	-1.3685E-03	1.9038E+00	1.9038E+00	2.132E+00
SN-113	#B	-7.3671E-04	-7.5937E-04	5.8667E-02	5.8667E-02	6.547E-02
SB-125	#F	1.1927E-01	1.1968E-01	1.1695E-01	1.1716E-01	7.618E-02
I-131	#B	4.2284E-04	6.5245E-04	5.0680E-02	5.0680E-02	3.835E-02
CS-134	#B	1.9372E-02	1.9462E-02	2.2339E-02	2.2368E-02	9.853E-02
CS-137	#A	4.1099E-02	4.1112E-02	4.6617E-02	4.6678E-02	4.899E-02
CE-139	#A	8.7525E-03	8.9774E-03	5.1140E-02	5.1142E-02	5.580E-02
EU-152	#B	1.8580E-04	1.8594E-04	1.6923E-01	1.6923E-01	1.904E-01
EU-154	#B	1.5871E-02	1.5888E-02	1.1581E-01	1.1581E-01	1.295E-01
EU-155	#B	1.4825E-01	1.4854E-01	2.6698E-01	2.6711E-01	2.925E-01
HG-203	#B	-9.1957E-03	-9.9105E-03	4.9866E-02	4.9869E-02	5.171E-02
TL-208		2.5199E-01	2.5199E-01	6.9148E-02	7.0679E-02	
PB-212		8.7842E-01	8.7842E-01	1.5511E-01	1.6328E-01	
PB-214		5.3343E-01	5.3343E-01	1.3840E-01	1.4182E-01	
BI-212	#	4.6069E-01	4.6069E-01	3.8701E-01	3.8793E-01	3.895E-01
BI-214		5.3766E-01	5.3766E-01	1.6870E-01	1.7157E-01	
RA-224	A	9.6802E-01	9.6802E-01	1.2711E+00	1.2723E+00	1.382E+00
RA-226	#	1.6281E+00	1.6281E+00	1.1770E+00	1.1808E+00	
AC-228		7.6567E-01	7.6567E-01	2.0920E-01	2.1387E-01	
TH-227	#B	5.8009E-02	5.8009E-02	3.5753E-01	3.5755E-01	4.012E-01
PA-234	#B	3.1506E-02	3.1506E-02	2.4895E-01	2.4895E-01	2.789E-01
TH-234	#B	3.9211E+00	3.9211E+00	6.8711E+00	6.8745E+00	7.559E+00
AM-241	#A	-4.3018E-01	-4.3019E-01	1.3903E+00	1.3905E+00	1.524E+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) 2.0517467E+01 pCi/gm
Total Decayed Activity (86.9 to 2000.7 keV) 2.0517477E+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_8AUG2006_1431.An1

Sample description
FSS-OOL-10-02-009-F-A

Spectrum Filename: C:\GammaVision\Spectra\107F_8AUG2006_1431.An1

Acquisition information
Start time: 08-Aug-2006 14:31:54
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: 1.7580E+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	07-Aug-2006 11:30:00
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. 9 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
74.97	121.	32.99	1.50	2.849E-02	74.81	9.600	PBC<MDA	PB212
77.19	200.	20.30	1.50	2.957E-02	77.11	10.700	4.847E-01	PB214
					77.11	17.500	PBC<MDA	PB212
77.19	204.	20.30	1.50	2.957E-02	77.11	10.700	4.847E-01	PB214
					77.11	17.500	3.034E-01	PB212
87.18	88.	40.75	1.50	3.284E-02	86.45	32.740	PBC<MDA	EU155
					88.04	3.790	PBC<MDA	CD109
92.70	118.	33.23	1.58	3.436E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
186.15	145.	23.25	1.57	3.609E-02	185.99	3.280	9.413E-01	RA226
238.75	393.	6.73	1.30	3.189E-02	238.63	43.100	2.109E-01	PB212
241.86	107.	20.34	1.30	3.164E-02	241.00	3.900	6.509E-01	RA224
					241.92	7.470	3.432E-01	PB214
270.67	42.	39.70	1.75	2.941E-02				
295.41	174.	10.92	1.34	2.768E-02				
295.41	174.	10.92	1.34	2.768E-02	295.22	19.200	2.455E-01	PB214
300.83	57.	30.67	0.81	2.730E-02				
338.82	113.	20.49	1.34	2.498E-02	338.40	12.010	2.815E-01	AC228
352.11	347.	8.08	1.46	2.425E-02	351.99	37.100	2.922E-01	PB214
510.81	29.	22.75	1.50	1.808E-02	510.72	22.500	PBC<MDA	TL208
583.39	132.	15.17	1.67	1.628E-02	583.14	86.000	6.999E-02	TL208
609.30	244.	10.43	1.93	1.574E-02				
609.30	244.	10.43	1.93	1.574E-02	609.32	46.090	2.539E-01	BI214
727.54	32.	34.25	1.64	1.374E-02	727.17	11.800	PBC<MDA	BI212
785.75	20.	40.75	1.68	1.297E-02	785.42	2.000	PBC<MDA	BI212
911.28	121.	13.34	1.97	1.161E-02	911.07	29.000	2.657E-01	AC228
968.64	97.	18.59	1.66	1.109E-02	968.90	17.460	3.761E-01	AC228

1120.69	46.	25.02	1.90	9.970E-03	1120.28	15.040	2.349E-01	BI214
1461.05	721.	3.78	2.57	8.190E-03	1460.75	10.700	6.286E+00	K40
1765.08	35.	20.26	2.29	7.084E-03	1764.51	15.920	2.355E-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	
477.13	238.71	153.	393.	0.196	20.20	1.297	PB-212	D
483.36	241.82	183.	107.	0.053	61.02	1.299	PB-214	D
540.97	270.67	118.	42.	0.021	119.10	1.753	AC-228	s
601.28	300.83	122.	57.	0.028	92.02	0.812	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	149.62	74.97	792.	121.	0.061	98.96	1.500s
PB-214	153.89	77.11	762.	200.	0.100	60.90	1.500D
PB-212	153.89	77.11	758.	204.	0.102	60.90	1.500D
EU-155	174.03	87.18	601.	88.	0.044	122.26	1.500s
RA-226	371.69	186.02	341.	93.	0.047	89.42	1.500s
PB-212	477.14	238.75	405.	372.	0.186	26.42	1.500s
RA-224	483.19	241.78	391.	74.	0.037	114.89	1.500s
PB-214	590.34	295.36	150.	178.	0.089	35.73	1.500
AC-228	677.25	338.82	132.	110.	0.055	61.48	1.341s
PB-214	703.82	352.10	113.	282.	0.141	23.40	1.500s
TL-208	1166.50	583.46	60.	98.	0.049	42.88	1.540
BI-214	1218.36	609.39	64.	194.	0.097	26.90	1.558s
Ag-108M	1223.06	611.74	140.	-50.	-0.025	108.91	1.561s
BI-212	1454.65	727.54	50.	32.	0.016	102.76	1.638
AC-228	1822.12	911.28	41.	116.	0.058	40.03	1.970s
AC-228	1936.85	968.64	59.	95.	0.047	55.76	1.658s
BI-214	2240.95	1120.69	46.	46.	0.023	75.07	1.897s
K-40	2921.70	1461.05	10.	717.	0.358	11.33	2.566s
BI-214	3529.81	1765.08	9.	35.	0.017	60.79	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		3.1706E-02					
			477.56	3.171E-02	&(	1.292E-01 3.77E-02	G
K-40		6.2857E+00					
			1460.75	6.286E+00	(P	1.551E-01 2.39E-01	G
MN-54		-1.5506E-03					
			834.81	-1.551E-03	&(P	2.396E-02 6.79E-03	G
CO-57		-3.1222E-03					
			122.07	-3.122E-03	%(P	2.342E-02 6.96E-03	G K
			136.43	7.918E-02	% P	1.682E-01 5.10E-02	G
CO-60		1.4410E-03					
			1332.51	1.441E-03	%(P	2.421E-02 6.50E-03	G K
			1173.23	-2.984E-03	% P	2.894E-02 7.81E-03	G K
Sr-85		-9.1842E-03					
			514.00	-9.184E-03	&(	2.479E-02 7.44E-03	G
Kr-85		-2.3920E+02					
			513.99	-2.392E+02	&(P	5.714E+02 1.70E+02	G
Y-88		-9.2347E-04					
			1836.01	-9.235E-04	%(P	2.592E-02 6.78E-03	G K
			898.02	-2.721E-03	& P	2.317E-02 6.42E-03	G
NB-94		-2.9313E-04					
			871.10	-2.931E-04	%(P	2.097E-02 5.84E-03	G K
			702.50	7.254E-03	% P	1.844E-02 5.50E-03	G K
Ag-108M		-3.0415E-05					
			722.95	-3.041E-05	&(	2.406E-02 6.80E-03	G K
			614.37	-2.725E-02	+	3.150E-02 9.89E-03	G
			433.93	4.698E-03	% P	1.620E-02 4.75E-03	G
CD-109		4.4889E-01					
			88.04	4.489E-01	%(P	7.138E-01 2.18E-01	G
SN-113		-6.5264E-04					
			391.71	-6.526E-04	%(P	2.245E-02 6.30E-03	G K
			255.04	-1.135E-01	%	7.395E-01 2.18E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	-1.6111E-03						
		427.95	-1.611E-03	%(P	4.770E-02	1.33E-02	G K
		600.77	-7.498E-03	% P	8.418E-02	2.32E-02	G
		636.15	5.056E-02	% P	1.325E-01	3.93E-02	G
		463.51	8.598E-02	% P	1.694E-01	5.11E-02	G
		176.29	-3.954E-02	% P	2.805E-01	8.28E-02	G
I-131	-3.4554E-03						
		364.48	-3.455E-03	%(	2.128E-02	6.22E-03	G K
		636.97	-3.700E-02	&	2.736E-01	7.86E-02	G
		284.29	4.789E-02	%	3.040E-01	8.95E-02	G
CS-134	3.1307E-03						
		604.66	3.131E-03	%(P	1.289E-02	3.70E-03	G K
		795.76	9.310E-03	% P	2.287E-02	6.84E-03	G
		569.29	-2.491E-02	%	1.226E-01	3.58E-02	G
		801.84	1.852E-02	& P	2.411E-01	6.83E-02	G
CS-137	-2.3779E-03						
		661.62	-2.378E-03	%(P	2.231E-02	6.06E-03	G
CE-139	-1.8340E-03						
		165.85	-1.834E-03	%(P	2.202E-02	6.50E-03	G
EU-152	-6.4850E-03						
		121.78	-6.485E-03	%(P	6.936E-02	2.06E-02	G K
		344.30	-7.360E-04	% P	5.291E-02	1.50E-02	G
		1408.08	8.506E-04	% P	8.157E-02	2.10E-02	G
		964.00	-3.876E-02	& P	2.058E-01	6.00E-02	G
		1112.07	-2.775E-02	% P	1.843E-01	5.23E-02	G
		778.90	2.271E-02	% P	1.258E-01	3.58E-02	G
EU-154	-1.0496E-02						
		123.10	-1.050E-02	%(P	4.567E-02	1.36E-02	G K
		1274.80	2.517E-03	& P	6.107E-02	1.67E-02	G
		723.30	2.095E-03	% P	1.112E-01	3.15E-02	G
		1004.80	-8.254E-04	% P	1.275E-01	3.53E-02	G
EU-155	6.3028E-02						
		86.45	6.303E-02	(	8.364E-02	2.57E-02	G K
		105.31	-1.328E-02	& P	8.650E-02	2.57E-02	G
HG-203	-4.8954E-03						
		279.17	-4.895E-03	%(P	2.331E-02	6.89E-03	G K
		72.87	-1.974E-01	% P	6.254E-01	1.88E-01	G
		70.83	5.331E-03	&	1.056E+00	3.14E-01	G
		82.50	-3.317E-01	%	1.363E+00	4.09E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	5.3632E-02						
		583.14	5.363E-02	(P	2.134E-02	8.02E-03	G
		510.72	5.535E-02	% P	9.522E-02	2.71E-02	G
PB-212	2.0802E-01						
		238.63	2.080E-01	*(P	5.396E-02	1.91E-02	G K
							Energy duplication
		77.11	3.034E-01	+	1.945E-01	6.16E-02	G
		74.81	3.405E-01	+ P	3.761E-01	1.16E-01	G
PB-214	2.4700E-01						
		351.99	2.412E-01	*(P	4.459E-02	1.92E-02	G K
		295.22	2.581E-01	(P	8.661E-02	3.15E-02	G
							Energy duplication
		77.11	4.847E-01	+ P	3.191E-01	1.01E-01	G
		241.92	1.644E-01	& P	3.281E-01	9.95E-02	G
BI-212	1.5260E-01						
		727.17	1.526E-01	(P	1.695E-01	5.44E-02	G K
		1620.56	-9.814E-02	% P	6.596E-01	1.74E-01	G
		785.42	5.785E-01	% P	7.946E-01	2.51E-01	G
BI-214	2.1771E-01						
		609.32	2.060E-01	*(P	4.228E-02	1.89E-02	G K
		1764.51	2.355E-01	*(P	1.136E-01	4.90E-02	G
		1120.28	2.349E-01	(P	1.756E-01	5.99E-02	G
RA-224	4.6072E-01						
		241.00	4.607E-01	&(P	5.900E-01	1.82E-01	G
RA-226	6.0613E-01						
		185.99	6.061E-01	*(	5.759E-01	1.81E-01	G
AC-228	3.0192E-01						
		911.07	2.657E-01	*(P	7.402E-02	3.67E-02	G K
		968.90	3.761E-01	*(P	1.531E-01	7.15E-02	G
		338.40	2.815E-01	@(P	1.440E-01	5.94E-02	G
TH-227	-1.0436E-01						
		236.00	-1.044E-01	&(P	2.372E-01	7.18E-02	G K
		256.25	5.503E-02	% P	2.339E-01	6.92E-02	G
PA-234	1.8410E-02						
		98.44	1.841E-02	%(	8.219E-02	2.46E-02	G K
		946.00	7.827E-03	&	1.051E-01	2.96E-02	G
		131.28	-7.898E-04	&	1.031E-01	3.05E-02	G
		94.67	-3.647E-02	%	1.685E-01	5.05E-02	G
		883.24	6.620E-03	&	1.453E-01	4.01E-02	G
		926.70	-1.528E-02	&	1.819E-01	5.11E-02	G

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 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26-3.710E-02 %   1.818E-01 5.31E-02 G

TH-234       8.9632E-02
                           63.29 8.963E-02 %(P 1.031E+00 3.04E-01 G K
                           92.80 4.880E-01 % P 8.746E-01 2.64E-01 G
                           92.38 6.402E-01 % P 1.039E+00 3.16E-01 G

AM-241      -7.8563E-03
                           59.54-7.856E-03 %(P 1.254E-01 3.71E-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	3.1246E-02	3.1706E-02	1.1297E-01	1.1298E-01	1.273E-01
K-40	#	6.2857E+00	6.2857E+00	7.1706E-01	8.0746E-01	
MN-54	#A	-1.5468E-03	-1.5506E-03	2.8854E-02	2.8854E-02	2.390E-02
CO-57	#B	-3.1132E-03	-3.1222E-03	2.1785E-02	2.1786E-02	2.336E-02
CO-60	#B	1.4404E-03	1.4410E-03	1.9506E-02	1.9506E-02	2.420E-02

Sr-85	#A	-9.0743E-03	-9.1842E-03	2.2316E-02	2.2323E-02	2.449E-02
Kr-85	#A	-2.3920E+02	-2.3920E+02	6.5349E+02	6.5365E+02	5.713E+02
Y-88	#B	-9.1674E-04	-9.2347E-04	3.3090E-02	3.3090E-02	2.574E-02
NB-94	#B	-2.9313E-04	-2.9313E-04	3.2334E-02	3.2334E-02	2.097E-02
Ag-108M	#B	-3.0414E-05	-3.0415E-05	2.0390E-02	2.0390E-02	2.406E-02
CD-109	#A	4.4812E-01	4.4889E-01	6.5387E-01	6.5435E-01	7.126E-01
SN-113	#B	-6.4823E-04	-6.5264E-04	9.4233E-02	9.4233E-02	2.230E-02
SB-125	#B	-1.6099E-03	-1.6111E-03	9.4780E-01	9.4780E-01	4.767E-02
I-131	#B	-3.1357E-03	-3.4554E-03	1.8655E-02	1.8656E-02	1.931E-02
CS-134	#B	3.1275E-03	3.1307E-03	1.1105E-02	1.1106E-02	1.288E-02
CS-137	#A	-2.3777E-03	-2.3779E-03	4.0302E-01	4.0302E-01	2.231E-02
CE-139	#A	-1.8236E-03	-1.8340E-03	2.1472E-02	2.1472E-02	2.189E-02
EU-152	#B	-6.4839E-03	-6.4850E-03	6.3598E-02	6.3599E-02	6.934E-02
EU-154	#B	-1.0494E-02	-1.0496E-02	4.3049E-02	4.3053E-02	4.566E-02
EU-155	#A	6.3001E-02	6.3028E-02	7.7059E-02	7.7138E-02	8.360E-02
HG-203	#B	-4.8141E-03	-4.8954E-03	2.4662E-02	2.4663E-02	2.293E-02
TL-208	#	5.3632E-02	5.3632E-02	2.4065E-02	2.4273E-02	2.134E-02
PB-212	#	2.0802E-01	2.0802E-01	5.7290E-02	5.8593E-02	5.396E-02
PB-214	#	2.4700E-01	2.4700E-01	5.3969E-02	5.5906E-02	4.459E-02
BI-212	#A	1.5260E-01	1.5260E-01	1.6308E-01	1.6333E-01	1.695E-01
BI-214	#	2.1771E-01	2.1771E-01	5.9866E-02	6.1231E-02	4.228E-02
RA-224	#A	4.6072E-01	4.6072E-01	5.4525E-01	5.4593E-01	5.900E-01
RA-226	#	6.0613E-01	6.0613E-01	5.4203E-01	5.4321E-01	5.759E-01
AC-228	#	3.0192E-01	3.0192E-01	9.5389E-02	9.7042E-02	
TH-227	#B	-1.0436E-01	-1.0436E-01	2.1770E-01	2.1779E-01	2.372E-01
PA-234	#B	1.8410E-02	1.8410E-02	7.3676E-02	7.3683E-02	8.219E-02
TH-234	#B	8.9632E-02	8.9632E-02	9.1138E-01	9.1139E-01	1.031E+00
AM-241	#A	-7.8563E-03	-7.8563E-03	1.3796E-01	1.3796E-01	1.254E-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) 6.5875773E+00 pCi/gm
Total Decayed Activity (270.2 to 2000.1 keV) 6.5875773E+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: 107F_9AUG2006_1619.An1

Sample description
FSS-OOL-10-02-008-F

Spectrum Filename: C:\GammaVision\Spectra\107F_9AUG2006_1619.An1

Acquisition information

Start time:	09-Aug-2006 16:19:59
Live time:	2000
Real time:	2003
Dead time:	0.16 %
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:	1.6850E+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	04-Aug-2006 13:20:00
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. 21 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.1070

***** 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
69.38	123.	41.48	1.50	2.625E-02	70.83	3.520	PBC<MDA	HG203
74.83	388.	11.39	1.18	2.849E-02	74.81	9.600	1.137E+00	PB212
77.13	425.	9.36	1.18	2.957E-02	77.11	17.500	9.902E-01	PB212
					77.11	10.700	1.608E+00	PB214
77.19	208.	25.63	1.50	2.957E-02	77.11	17.500	PBC<MDA	PB212
					77.11	10.700	PBC<MDA	PB214
87.22	187.	32.10	1.50	3.284E-02	86.45	32.740	PBC<MDA	EU155
					88.04	3.790	PBC<MDA	CD109
87.27	181.	31.72	1.50	3.327E-02	86.45	32.740	PBC<MDA	EU155
					88.04	3.790	PBC<MDA	CD109
93.22	161.	31.74	1.50	3.438E-02	92.80	3.000	PBC<MDA	TH234
153.00	137.	34.12	1.08	3.800E-02				
186.39	286.	17.06	1.99	3.607E-02	185.99	3.280	1.940E+00	RA226
209.40	90.	34.14	1.11	3.428E-02				
238.77	1446.	3.30	1.30	3.188E-02	238.63	43.100	8.345E-01	PB212
241.75	267.	13.33	1.30	3.164E-02	241.00	3.900	1.720E+00	RA224
					241.92	7.470	9.026E-01	PB214
270.17	130.	23.26	1.03	2.945E-02				
295.37	333.	8.19	1.34	2.767E-02	295.22	19.200	4.960E-01	PB214
300.61	66.	32.01	1.34	2.732E-02				
328.30	147.	24.04	1.50	2.559E-02				
338.50	353.	8.75	1.88	2.500E-02	338.40	12.010	9.331E-01	AC228
352.04	676.	6.55	1.47	2.426E-02	351.99	37.100	5.983E-01	PB214
462.83	108.	21.61	0.87	1.955E-02				
462.83	108.	21.61	0.87	1.955E-02	463.51	10.000	4.335E-01	SB125
510.89	227.	14.94	1.48	1.808E-02	510.72	22.500	3.804E-01	TL208
583.33	484.	6.37	1.70	1.629E-02	583.14	86.000	2.745E-01	TL208

609.49	474.	7.46	1.66	1.574E-02	609.32	46.090	5.196E-01	BI214
727.19	165.	15.57	2.00	1.374E-02	727.17	11.800	8.106E-01	BI212
785.49	45.	38.05	0.69	1.297E-02	785.42	2.000	PBC<MDA	BI212
795.22	81.	25.78	1.27	1.285E-02				
795.22	81.	25.78	1.27	1.285E-02	795.76	85.400	5.943E-02	CS134
911.40	397.	7.48	1.63	1.160E-02	911.07	29.000	9.353E-01	AC228
964.91	54.	24.27	1.80	1.112E-02				

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
969.13	237.	7.91	1.80	1.109E-02	968.90	17.460	9.740E-01	AC228
1120.57	168.	16.22	2.25	9.968E-03	1120.28	15.040	8.960E-01	BI214
1378.35	57.	23.96	1.57	8.555E-03				
1461.03	1738.	2.44	2.22	8.190E-03	1460.75	10.700	1.586E+01	K40
1621.16	27.	35.40	0.72	7.569E-03	1620.56	2.750	1.044E+00	BI212
1764.78	119.	10.31	1.98	7.083E-03	1764.51	15.920	8.399E-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
305.65	153.00	819.	137.	0.068	102.35	1.078	CS-136 s
418.45	209.40	427.	90.	0.045	102.42	1.106	AC-228
539.96	270.17	339.	130.	0.065	69.78	1.034	AC-228 s
600.85	300.48	190.	66.	0.033	96.02	1.341	PB-212 lD
656.21	328.30	343.	147.	0.073	72.11	1.496	RH-106M s
1930.07	965.04	63.	51.	0.025	79.01	1.797	AC-228 D
2756.29	1378.35	39.	57.	0.028	71.89	1.573	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
HG-203	138.42	69.38	1236.	123.	0.061	124.45	1.500s
PB-212	149.29	74.81	803.	388.	0.194	34.18	1.178D
PB-212	153.89	77.11	880.	425.	0.213	28.07	1.179A
PB-214	153.89	77.11	1517.	208.	0.104	76.89	1.500A
EU-155	174.10	87.22	1703.	187.	0.093	96.29	1.500s
CD-109	174.20	87.27	1558.	181.	0.090	95.16	1.500s
TH-234	186.11	93.22	1573.	161.	0.080	95.21	1.500
RA-226	372.43	186.39	779.	286.	0.143	51.19	1.991s
TH-227	471.93	236.15	1293.	-138.	-0.069	113.60	1.500s
PB-212	476.89	238.63	379.	1419.	0.709	9.72	1.297D
RA-224	480.87	240.62	243.	162.	0.081	46.39	1.500
PB-214	483.47	241.92	527.	242.	0.121	44.27	1.299D
PB-214	590.15	295.26	441.	410.	0.205	30.01	1.612s
AC-228	676.61	338.50	234.	349.	0.175	26.25	1.879s
PB-214	703.69	352.04	373.	671.	0.336	19.65	1.471
SB-125	925.94	463.17	184.	74.	0.037	81.66	1.500s
TL-208	1021.38	510.89	282.	193.	0.096	44.81	1.483s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
TL-208	1166.24	583.33	161.	479.	0.240	19.12	1.702
BI-214	1218.55	609.49	215.	470.	0.235	22.39	1.656
Ag-108M	1224.77	612.60	237.	-55.	-0.028	124.65	1.561s
BI-212	1453.94	727.19	139.	164.	0.082	46.70	1.996s
BI-212	1570.55	785.49	98.	45.	0.022	114.16	0.689s
CS-134	1589.74	795.09	101.	46.	0.023	101.55	1.684s
AC-228	1822.36	911.40	119.	393.	0.196	22.44	1.628
EU-152	1933.57	967.00	368.	-87.	-0.043	99.44	1.796s
AC-228	1937.36	968.90	62.	235.	0.118	23.87	1.799D
BI-214	2240.71	1120.57	138.	168.	0.084	48.67	2.253s
K-40	2921.65	1461.03	18.	1733.	0.867	7.31	2.222
BI-212	3241.93	1621.16	18.	27.	0.014	106.20	0.722s
BI-214	3529.21	1764.78	8.	118.	0.059	30.93	1.979

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		5.6647E-02					
			477.56	5.665E-02	%(	2.815E-01 8.33E-02	G
K-40		1.5859E+01					
			1460.75	1.586E+01	(P	2.054E-01 3.88E-01	G
MN-54		2.1688E-02					
			834.81	2.169E-02	%(P	3.136E-02 9.73E-03	G
CO-57		-1.1787E-02					
			122.07	-1.179E-02	%(P	4.137E-02 1.25E-02	G K
			136.43	3.287E-02	% P	3.070E-01 9.19E-02	G
CO-60		1.3323E-02					
			1332.51	1.332E-02	%(P	2.911E-02 8.62E-03	G K
			1173.23	2.199E-02	% P	4.223E-02 1.28E-02	G K
Sr-85		-1.6807E-02					
			514.00	-1.681E-02	%(	4.048E-02 1.22E-02	G
Kr-85		-3.9849E+02					
			513.99	-3.985E+02	%(P	8.888E+02 2.67E+02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
Y-88	2.5558E-03						
		1836.01	2.556E-03	&(P	2.229E-02	5.93E-03	G K
		898.02	5.418E-03	% P	3.048E-02	8.82E-03	G
NB-94	-3.2513E-03						
		871.10	-3.251E-03	%(P	2.939E-02	8.49E-03	G K
		702.50	-3.032E-04	& P	3.689E-02	1.07E-02	G K
Ag-108M	-2.7410E-02						
		722.95	-2.741E-02	%(	4.722E-02	1.44E-02	G K
		614.37	-3.142E-02	&	4.225E-02	1.31E-02	G
		433.93	-1.074E-02	% P	2.990E-02	8.93E-03	G
CD-109	1.1582E+00						
		88.04	1.158E+00	(P	1.196E+00	3.68E-01	G
SN-113	-4.1091E-03						
		391.71	-4.109E-03	%(P	4.266E-02	1.25E-02	G K
		255.04	3.509E-01	%	1.269E+00	3.80E-01	G
SB-125	7.8979E-02						
		427.95	2.355E-03	%(P	8.765E-02	2.55E-02	G K
		600.77	-1.487E-03	& P	1.612E-01	4.65E-02	G
		636.15	1.144E-02	% P	2.163E-01	6.21E-02	G
		463.51	3.058E-01	*(P	2.717E-01	8.64E-02	G
		176.29	-1.747E-01	% P	4.869E-01	1.47E-01	G
I-131	2.7683E-03						
		364.48	2.768E-03	%(	4.837E-02	1.42E-02	G K
		636.97	0.000E+00	&	6.044E-01	1.74E-01	G
		284.29	-5.872E-02	%	6.645E-01	1.97E-01	G
CS-134	1.4082E-02						
		604.66	-3.149E-03	&(P	7.076E-02	2.11E-02	G K
		795.76	3.377E-02	*(P	3.642E-02	1.16E-02	G
		569.29	-1.069E-03	&	1.748E-01	5.05E-02	G
		801.84	-4.946E-03	& P	2.484E-01	6.94E-02	G
CS-137	9.6598E-03						
		661.62	9.660E-03	%(P	3.768E-02	1.11E-02	G
CE-139	-3.5896E-04						
		165.85	-3.590E-04	%(P	3.970E-02	1.18E-02	G
EU-152	-3.5126E-02						
		121.78	-3.513E-02	%(P	1.230E-01	3.71E-02	G K
		344.30	2.397E-02	% P	9.703E-02	2.89E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
		1408.08	2.681E-02	% P	1.169E-01	3.34E-02	G
		964.00	-4.283E-01	+ P	4.554E-01	1.42E-01	G
		1112.07	-9.370E-03	% P	2.131E-01	5.98E-02	G
		778.90	7.871E-02	& P	2.318E-01	6.91E-02	G
EU-154	-2.8249E-04						
		123.10	-2.825E-04	&(P	8.514E-02	2.54E-02	G K
		1274.80	3.376E-02	% P	8.885E-02	2.65E-02	G
		723.30	-5.568E-02	% P	1.069E-01	3.25E-02	G
		1004.80	-3.446E-03	& P	2.078E-01	5.96E-02	G
EU-155	1.3956E-01						
		86.45	1.396E-01	(	1.457E-01	4.48E-02	G K
		105.31	5.845E-02	% P	1.597E-01	4.82E-02	G
HG-203	4.7906E-02						
		279.17	3.002E-04	&(P	3.744E-02	1.11E-02	G K
		72.87	-3.914E-01	% P	1.151E+00	3.48E-01	G
		70.83	1.150E+00	&(	1.560E+00	4.77E-01	G
		82.50	-7.379E-01	%	2.249E+00	6.79E-01	G
TL-208	2.7447E-01						
		583.14	2.745E-01	(P	3.535E-02	1.77E-02	G
		510.72	3.804E-01	+ P	1.596E-01	6.67E-02	G
PB-212	8.2782E-01						
		238.63	8.278E-01	(P	5.451E-02	2.71E-02	G K
							Energy duplication
		77.11	6.589E-01	}	2.184E-01	6.17E-02	G
		74.81	1.137E+00	+ P	3.952E-01	1.31E-01	G
PB-214	6.0552E-01						
		351.99	5.983E-01	(P	8.257E-02	3.95E-02	G K
		295.22	6.195E-01	(P	1.517E-01	6.27E-02	G
							Energy duplication
		77.11	5.261E-01	} P	4.669E-01	1.35E-01	G
		241.92	8.226E-01	+ P	3.722E-01	1.22E-01	G
BI-212	8.5476E-01						
		727.17	8.106E-01	(P	2.852E-01	1.27E-01	G K
		1620.56	1.044E+00	(P	8.641E-01	3.77E-01	G
		785.42	1.387E+00	+ P	1.512E+00	5.43E-01	G
BI-214	5.1960E-01						
		609.32	5.196E-01	(P	7.851E-02	3.91E-02	G K
		1764.51	8.399E-01	+ P	1.124E-01	8.73E-02	G
		1120.28	8.960E-01	+ P	3.078E-01	1.46E-01	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments

RA-224       1.0512E+00
                          241.00 1.051E+00  (P 4.885E-01 1.65E-01 G

RA-226       1.9397E+00
                          185.99 1.940E+00 *(  8.990E-01 3.31E-01 G

AC-228       9.4625E-01
                          911.07 9.353E-01  (P 1.278E-01 7.07E-02 G K
                          968.90 9.736E-01  (P 1.630E-01 7.82E-02 G
                          338.40 9.331E-01 *(P 1.975E-01 8.24E-02 G

TH-227      -3.0795E-01
                          236.00-3.080E-01 ?(P 3.798E-01 1.16E-01 G K
                          256.25-1.679E-02 % P 4.114E-01 1.22E-01 G

PA-234      -4.2924E-02
                           98.44-4.292E-02 &(  1.448E-01 4.36E-02 G K
                          946.00-1.870E-02 %   1.889E-01 5.50E-02 G
                          131.28-2.775E-02 &   1.682E-01 5.05E-02 G
                           94.67-6.165E-05 %   2.742E-01 8.20E-02 G
                          883.24-2.711E-02 %   2.710E-01 7.86E-02 G
                          926.70 6.577E-02 &   2.854E-01 8.39E-02 G
                          569.26 5.916E-04 &   2.670E-01 7.72E-02 G

TH-234       1.0556E+00
                           63.29 9.051E-01 %(P 1.834E+00 5.55E-01 G K
                           92.80 1.251E+00  (P 1.458E+00 4.46E-01 G
                           92.38 2.577E-01 & P 1.624E+00 4.87E-01 G

AM-241      -5.4465E-02
                           59.54-5.447E-02 %(P 2.508E-01 7.54E-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	

- -

***** 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	5.3001E-02	5.6647E-02	2.4999E-01	2.5001E-01	2.634E-01
K-40		1.5859E+01	1.5859E+01	1.1629E+00	1.4932E+00	
MN-54	#A	2.1443E-02	2.1688E-02	2.9188E-02	2.9216E-02	3.101E-02
CO-57	#B	-1.1633E-02	-1.1787E-02	3.7836E-02	3.7841E-02	4.083E-02
CO-60	#B	1.3298E-02	1.3323E-02	2.5871E-02	2.5883E-02	2.906E-02
Sr-85	#A	-1.5911E-02	-1.6807E-02	3.6675E-02	3.6689E-02	3.832E-02
Kr-85	#A	-3.9847E+02	-3.9849E+02	9.3691E+02	9.3720E+02	8.888E+02
Y-88	#B	2.4721E-03	2.5558E-03	1.7785E-02	1.7785E-02	2.156E-02
NB-94	#B	-3.2513E-03	-3.2513E-03	2.6924E-02	2.6925E-02	2.939E-02
Ag-108M	#B	-2.7408E-02	-2.7410E-02	4.3276E-02	4.3306E-02	4.721E-02
CD-109	#A	1.1491E+00	1.1582E+00	1.1041E+00	1.1060E+00	1.187E+00
SN-113	#B	-3.9842E-03	-4.1091E-03	6.3127E-02	6.3127E-02	4.136E-02
SB-125	#B	7.8703E-02	7.8979E-02	6.6937E-02	6.7100E-02	8.734E-02
I-131	#B	1.7796E-03	2.7683E-03	4.2621E-02	4.2622E-02	3.109E-02
CS-134	#B	1.4015E-02	1.4082E-02	1.4465E-02	1.4489E-02	7.042E-02
CS-137	#A	9.6567E-03	9.6598E-03	3.3369E-02	3.3374E-02	3.767E-02
CE-139	#A	-3.4980E-04	-3.5896E-04	6.0579E-02	6.0579E-02	3.869E-02
EU-152	#B	-3.5099E-02	-3.5126E-02	1.1189E-01	1.1190E-01	1.229E-01
EU-154	#B	-2.8217E-04	-2.8249E-04	8.2376E-02	8.2376E-02	8.504E-02
EU-155	#A	1.3928E-01	1.3956E-01	1.3439E-01	1.3461E-01	1.455E-01
HG-203	#F	4.4389E-02	4.7906E-02	5.9620E-02	5.9687E-02	3.469E-02
TL-208		2.7447E-01	2.7447E-01	5.2990E-02	5.5414E-02	
PB-212		8.2782E-01	8.2782E-01	8.1368E-02	9.4927E-02	
PB-214		6.0552E-01	6.0552E-01	1.0968E-01	1.1536E-01	
BI-212		8.5476E-01	8.5476E-01	4.0229E-01	4.0545E-01	
BI-214		5.1960E-01	5.1960E-01	1.1741E-01	1.2135E-01	
RA-224		1.0512E+00	1.0512E+00	4.9433E-01	4.9821E-01	4.885E-01
RA-226	#	1.9397E+00	1.9397E+00	9.9304E-01	9.9962E-01	
AC-228		9.4625E-01	9.4625E-01	1.3370E-01	1.4491E-01	
TH-227	#A	-3.0795E-01	-3.0795E-01	3.5054E-01	3.5101E-01	3.798E-01

PA-234 #B	-4.2924E-02	-4.2924E-02	1.3090E-01	1.3092E-01	1.448E-01

TH-234 #B	1.0556E+00	1.0556E+00	1.1233E+00	1.1248E+00	1.834E+00
AM-241 #A	-5.4464E-02	-5.4465E-02	2.3377E-01	2.3379E-01	2.508E-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 (1120.2 to 2000.1 keV) 2.2877985E+01 pCi/gm
Total Decayed Activity (1120.2 to 2000.1 keV) 2.2877996E+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_9AUG2006_1657.An1

Sample description
FSS-OOL-10-02-002-F

Spectrum Filename: C:\GammaVision\Spectra\107F_9AUG2006_1657.An1

Acquisition information

Start time:	09-Aug-2006 16:57:50
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:	1.7300E+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	04-Aug-2006 14:30:00
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. 16 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.1229

***** 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	236.	14.62	1.18	2.842E-02				
74.63	236.	14.62	1.18	2.842E-02	74.81	9.600	6.615E-01	PB212
77.19	328.	11.03	1.18	2.962E-02	77.11	17.500	4.953E-01	PB212
					77.11	10.700	7.983E-01	PB214
93.37	158.	25.46	1.64	3.450E-02	92.38	2.570	1.325E+00	TH234
					92.80	3.000	PBC<MDA	TH234
185.50	177.	23.37	1.74	3.614E-02				
185.50	177.	23.37	1.74	3.614E-02	185.99	3.280	1.165E+00	RA226
239.01	926.	5.79	1.47	3.186E-02	238.63	43.100	5.170E-01	PB212
270.39	91.	34.70	1.65	2.943E-02				
295.34	231.	9.95	1.34	2.766E-02	295.22	19.200	3.325E-01	PB214
300.46	55.	32.98	1.34	2.732E-02				
338.61	167.	15.93	1.23	2.499E-02	338.40	12.010	4.260E-01	AC228
351.95	382.	7.13	1.72	2.426E-02				
351.95	382.	7.13	1.72	2.426E-02	351.99	37.100	3.271E-01	PB214
462.65	57.	39.74	0.97	1.956E-02				
477.88	118.	14.75	2.00	1.906E-02	477.56	10.300	5.014E-01	BE7
510.36	198.	13.67	2.15	1.809E-02	510.72	22.500	3.152E-01	TL208
583.25	235.	12.36	1.70	1.629E-02	583.14	86.000	1.287E-01	TL208
609.50	291.	7.42	1.60	1.574E-02	609.32	46.090	3.084E-01	BI214
661.83	136.	17.51	1.66	1.477E-02	661.62	84.620	8.269E-02	CS137
727.51	90.	22.71	1.64	1.374E-02	727.17	11.800	4.249E-01	BI212
911.31	192.	12.58	1.59	1.161E-02	911.07	29.000	4.366E-01	AC228
969.08	124.	16.93	1.71	1.109E-02	968.90	17.460	4.911E-01	AC228
1119.98	104.	22.43	1.61	9.970E-03	1120.28	15.040	5.398E-01	BI214
1173.53	305.	8.96	2.27	9.636E-03	1173.23	99.860	2.450E-01	CO60
1332.63	205.	8.11	2.09	8.772E-03	1332.51	99.980	1.798E-01	CO60

1461.10	1251.	2.87	2.22	8.189E-03	1460.75	10.700	1.111E+01	K40
1764.93	55.	13.36	2.00	7.084E-03	1764.51	15.920	3.817E-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	
148.93	74.67	475.	236.	0.118	43.87	1.178	BI-207	D
154.04	77.22	491.	328.	0.164	33.09	1.179	BI-207	D
477.65	239.01	1215.	237.	0.119	65.32	1.475	PB-212	s
540.41	270.39	322.	91.	0.045	104.11	1.646	AC-228	s
600.54	300.51	136.	55.	0.027	98.93	1.341	PB-212	lD
924.90	462.65	161.	48.	0.024	119.49	0.965	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	149.36	74.85	1140.	210.	0.105	70.03	1.500s
PB-212	153.89	77.11	1068.	272.	0.136	54.20	1.500D
PB-214	153.89	77.11	1072.	267.	0.133	54.20	1.500D
TH-234	185.53	92.93	888.	185.	0.092	68.74	1.500s
TH-234	185.53	92.94	894.	157.	0.079	74.36	1.500s
RA-226	371.78	186.07	520.	138.	0.069	74.63	1.500s
PB-212	477.12	238.74	573.	661.	0.331	18.76	1.500s
PB-214	590.33	295.35	276.	238.	0.119	34.72	1.500s
AC-228	676.83	338.61	211.	164.	0.082	47.79	1.232s
PB-214	703.67	352.03	178.	360.	0.180	21.92	1.500s
BE-7	955.35	477.88	84.	118.	0.059	44.24	1.999s
TL-208	1020.30	510.36	182.	164.	0.082	41.02	2.153s
TL-208	1166.08	583.25	161.	231.	0.115	37.07	1.702
BI-214	1218.57	609.50	72.	286.	0.143	22.26	1.599s
Ag-108M	1223.92	612.17	196.	-56.	-0.028	113.39	1.561s
CS-137	1323.23	661.83	114.	132.	0.066	52.54	1.655s
BI-212	1454.58	727.51	94.	88.	0.044	68.14	1.638
AC-228	1822.18	911.31	108.	188.	0.094	37.75	1.589
AC-228	1937.73	969.08	101.	122.	0.061	50.79	1.714
BI-214	2239.53	1119.98	109.	104.	0.052	67.29	1.610s
CO-60	2346.62	1173.53	110.	301.	0.151	26.88	2.274s
CO-60	2664.85	1332.63	28.	202.	0.101	24.32	2.092
K-40	2921.79	1461.10	18.	1246.	0.623	8.62	2.220
BI-214	3529.51	1764.93	1.	55.	0.028	40.09	2.000s

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		5.0141E-01					
			477.56	5.014E-01	(	1.930E-01 7.40E-02	G
K-40		1.1106E+01					
			1460.75	1.111E+01	(P	2.000E-01 3.21E-01	G
MN-54		2.6766E-03					
			834.81	2.677E-03	%(P	2.523E-02 7.24E-03	G
CO-57		6.4221E-03					
			122.07	6.422E-03	%(P	3.079E-02 9.23E-03	G K
			136.43	7.491E-02	% P	2.326E-01 7.00E-02	G
CO-60		1.7981E-01					
			1332.51	1.798E-01	(P	2.460E-02 1.48E-02	G K
			1173.23	2.450E-01	+ P	4.190E-02 2.23E-02	G K
Sr-85		-8.1902E-03					
			514.00	-8.190E-03	%(	3.116E-02 9.28E-03	G
Kr-85		-2.0922E+02					
			513.99	-2.092E+02	%(P	6.863E+02 2.03E+02	G
Y-88		-3.7183E-03					
			1836.01	-3.718E-03	%(P	2.449E-02 6.53E-03	G K
			898.02	-1.918E-03	% P	3.249E-02 9.20E-03	G
NB-94		-1.7812E-03					
			871.10	-1.781E-03	&(P	2.961E-02 8.51E-03	G K
			702.50	-4.133E-03	% P	2.834E-02 8.26E-03	G K
Ag-108M		-1.5364E-02					
			722.95	-1.536E-02	%(	3.619E-02 1.09E-02	G K
			614.37	-3.094E-02	&	3.755E-02 1.17E-02	G
			433.93	2.493E-03	% P	2.393E-02 6.97E-03	G
CD-109		1.1296E-02					
			88.04	1.130E-02	%(P	1.001E+00 2.99E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SN-113	7.7232E-03						
		391.71	7.723E-03	%(P	3.117E-02	9.20E-03	G K
		255.04	2.692E-01	%	1.159E+00	3.46E-01	G
SB-125	-1.7859E-03						
		427.95	-1.786E-03	%(P	7.603E-02	2.19E-02	G K
		600.77	-6.379E-03	% P	9.956E-02	2.78E-02	G
		636.15	-4.394E-03	% P	1.885E-01	5.33E-02	G
		463.51	2.373E-02	% P	2.350E-01	6.84E-02	G
		176.29	3.399E-02	& P	3.885E-01	1.16E-01	G
I-131	-1.3155E-03						
		364.48	-1.315E-03	%(	3.850E-02	1.12E-02	G K
		636.97	1.555E-02	%	3.893E-01	1.10E-01	G
		284.29	-1.340E-01	&	5.981E-01	1.78E-01	G
CS-134	-1.3714E-02						
		604.66	-1.371E-02	%(P	3.004E-02	9.07E-03	G K
		795.76	1.884E-02	% P	3.286E-02	1.01E-02	G
		569.29	-5.912E-03	%	1.358E-01	3.89E-02	G
		801.84	-6.768E-02	% P	3.457E-01	1.01E-01	G
CS-137	8.2685E-02						
		661.62	8.269E-02	*(P	3.276E-02	1.49E-02	G
CE-139	5.0259E-03						
		165.85	5.026E-03	%(P	2.777E-02	8.29E-03	G
EU-152	1.9027E-02						
		121.78	1.903E-02	%(P	9.112E-02	2.73E-02	G K
		344.30	-1.815E-02	% P	8.090E-02	2.40E-02	G
		1408.08	-8.438E-03	% P	1.205E-01	3.29E-02	G
		964.00	-2.496E-04	& P	3.070E-01	8.92E-02	G
		1112.07	1.040E-01	% P	2.151E-01	6.52E-02	G
		778.90	-1.839E-02	% P	2.031E-01	5.83E-02	G
EU-154	1.1150E-04						
		123.10	1.115E-04	&(P	6.804E-02	2.02E-02	G K
		1274.80	-5.380E-03	& P	9.135E-02	2.59E-02	G
		723.30	7.391E-02	% P	9.959E-02	3.14E-02	G
		1004.80	6.749E-02	& P	1.338E-01	4.07E-02	G
EU-155	6.1120E-02						
		86.45	6.112E-02	%(	1.051E-01	3.20E-02	G K
		105.31	2.757E-02	% P	1.301E-01	3.90E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
HG-203	1.2696E-02						
		279.17	1.270E-02	%(P	2.778E-02	8.40E-03	G K
		72.87	-1.613E-01	& P	6.568E-01	1.97E-01	G
		70.83	-2.164E-01	%	1.407E+00	4.22E-01	G
		82.50	-5.159E-01	%	1.742E+00	5.25E-01	G
TL-208	1.2872E-01						
		583.14	1.287E-01	(P	3.449E-02	1.62E-02	G
		510.72	3.152E-01	+ P	1.259E-01	5.19E-02	G
PB-212	3.8551E-01						
		238.63	3.756E-01	*(P	6.493E-02	2.40E-02	G K
							Energy duplication
		77.11	4.099E-01	*(	2.339E-01	7.40E-02	G
		74.81	5.988E-01	+ P	4.570E-01	1.42E-01	G
PB-214	3.2473E-01						
		351.99	3.121E-01	@(P	5.629E-02	2.31E-02	G K
		295.22	3.492E-01	*(P	1.178E-01	4.12E-02	G
							Energy duplication
		77.11	6.586E-01	+ P	3.834E-01	1.21E-01	G
		241.92	-1.202E-01	% P	4.112E-01	1.23E-01	G
BI-212	4.2491E-01						
		727.17	4.249E-01	(P	2.304E-01	9.80E-02	G K
		1620.56	-8.155E-02	% P	7.630E-01	2.03E-01	G
		785.42	6.479E-01	% P	1.355E+00	4.10E-01	G
BI-214	3.0842E-01						
		609.32	3.084E-01	*(P	4.535E-02	2.32E-02	G K
		1764.51	3.817E-01	+ P	5.105E-02	5.18E-02	G
		1120.28	5.398E-01	+ P	2.680E-01	1.22E-01	G
RA-224	5.9039E-02						
		241.00	5.904E-02	%(P	7.667E-01	2.28E-01	G
RA-226	9.1020E-01						
		185.99	9.102E-01	(	7.190E-01	2.26E-01	G
AC-228	4.5071E-01						
		911.07	4.366E-01	(P	1.186E-01	5.62E-02	G K
		968.90	4.911E-01	(P	2.000E-01	8.47E-02	G
		338.40	4.260E-01	@(P	1.832E-01	6.92E-02	G
TH-227	-1.0248E-01						
		236.00	-1.025E-01	%(P	2.753E-01	8.31E-02	G K
		256.25	8.211E-02	% P	3.217E-01	9.60E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
PA-234	1.9867E-02						
		98.44	1.987E-02	%(	1.183E-01	3.54E-02	G K
		946.00	-1.344E-02	%	1.510E-01	4.35E-02	G
		131.28	-1.637E-02	&	1.415E-01	4.23E-02	G
		94.67	-2.779E-02	&	1.800E-01	5.38E-02	G
		883.24	-5.624E-02	%	2.408E-01	7.08E-02	G
		926.70	-5.764E-02	%	2.381E-01	6.98E-02	G
		569.26	-9.279E-03	%	2.006E-01	5.75E-02	G
TH-234	1.0302E+00						
		63.29	5.052E-01	%(P	1.368E+00	4.11E-01	G K
		92.80	1.191E+00	@(P	1.076E+00	3.32E-01	G
		92.38	1.639E+00	@(P	1.255E+00	3.92E-01	G
AM-241	6.8278E-04						
		59.54	6.828E-04	&(P	1.426E-01	4.22E-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	

- -

***** 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	#	4.6928E-01	5.0141E-01	2.2183E-01	2.2379E-01	
K-40		1.1106E+01	1.1106E+01	9.6146E-01	1.1639E+00	
MN-54	#A	2.6465E-03	2.6766E-03	2.1721E-02	2.1721E-02	2.495E-02
CO-57	#B	6.3385E-03	6.4221E-03	2.7685E-02	2.7687E-02	3.039E-02
CO-60		1.7948E-01	1.7981E-01	4.4541E-02	4.5790E-02	
Sr-85	#A	-7.7554E-03	-8.1902E-03	2.7852E-02	2.7856E-02	2.951E-02
Kr-85	#A	-2.0921E+02	-2.0922E+02	8.1431E+02	8.1441E+02	6.863E+02
Y-88	#B	-3.5969E-03	-3.7183E-03	3.3309E-02	3.3310E-02	2.369E-02
NB-94	#B	-1.7812E-03	-1.7812E-03	2.8194E-02	2.8194E-02	2.961E-02
Ag-108M	#B	-1.5363E-02	-1.5364E-02	3.2749E-02	3.2762E-02	3.618E-02
CD-109	#A	1.1208E-02	1.1296E-02	8.9587E-01	8.9587E-01	9.928E-01
SN-113	#B	7.4895E-03	7.7232E-03	2.7612E-02	2.7615E-02	3.023E-02
SB-125	#B	-1.7797E-03	-1.7859E-03	1.8457E-01	1.8457E-01	7.577E-02
I-131	#B	-8.4729E-04	-1.3155E-03	3.3601E-02	3.3601E-02	2.480E-02
CS-134	#B	-1.3650E-02	-1.3714E-02	2.8282E-02	2.8293E-02	2.990E-02
CS-137	#	8.2659E-02	8.2685E-02	4.4601E-02	4.4867E-02	
CE-139	#A	4.8983E-03	5.0259E-03	2.4863E-02	2.4865E-02	2.707E-02
EU-152	#B	1.9013E-02	1.9027E-02	8.1955E-02	8.1962E-02	9.105E-02
EU-154	#B	1.1137E-04	1.1150E-04	6.0684E-02	6.0684E-02	6.796E-02
EU-155	#B	6.1001E-02	6.1120E-02	9.6032E-02	9.6092E-02	1.049E-01
HG-203	#B	1.1768E-02	1.2696E-02	2.5206E-02	2.5217E-02	2.575E-02
TL-208		1.2872E-01	1.2872E-01	4.8657E-02	4.9247E-02	
PB-212	#	3.8551E-01	3.8551E-01	7.4050E-02	7.7472E-02	6.493E-02
PB-214	#	3.2473E-01	3.2473E-01	6.7852E-02	7.0510E-02	5.629E-02
BI-212		4.2491E-01	4.2491E-01	2.9376E-01	2.9483E-01	
BI-214	#	3.0842E-01	3.0842E-01	6.9686E-02	7.2028E-02	
RA-224	#A	5.9039E-02	5.9039E-02	6.8429E-01	6.8430E-01	7.667E-01
RA-226	#	9.1019E-01	9.1020E-01	6.7932E-01	6.8144E-01	7.190E-01
AC-228		4.5071E-01	4.5071E-01	1.2150E-01	1.2439E-01	
TH-227	#B	-1.0248E-01	-1.0248E-01	2.5218E-01	2.5225E-01	2.753E-01
PA-234	#B	1.9867E-02	1.9867E-02	1.0624E-01	1.0625E-01	1.183E-01
TH-234	#B	1.0302E+00	1.0302E+00	7.3874E-01	7.4095E-01	1.368E+00
AM-241	#A	6.8276E-04	6.8278E-04	1.2653E-01	1.2653E-01	1.426E-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 (87.2 to 2000.1 keV) 1.3149884E+01 pCi/gm
Total Decayed Activity (87.2 to 2000.1 keV) 1.3182375E+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_9AUG2006_1734.An1

Sample description
FSS-OOL-10-02-001-F

Spectrum Filename: C:\GammaVision\Spectra\107F_9AUG2006_1734.An1

Acquisition information
Start time: 09-Aug-2006 17:34:41
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: 1.8650E+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	04-Aug-2006 13:45:00
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. 25 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
62.87	157.	30.69	1.22	1.971E-02				
62.87	157.	30.69	1.22	1.971E-02	63.29	3.900	PBC<MDA	TH234
74.81	391.	11.61	1.18	2.849E-02	74.81	9.600	1.037E+00	PB212
77.11	553.	6.76	1.18	2.957E-02	77.11	10.700	1.356E+00	PB214
					77.11	17.500	8.360E-01	PB212
83.99	118.	32.02	1.18	3.217E-02				
87.13	257.	15.30	1.19	3.307E-02	86.45	32.740	1.738E-01	EU155
					88.04	3.790	1.489E+00	CD109
89.63	185.	21.25	1.19	3.370E-02				
93.24	236.	16.90	1.19	3.451E-02	92.38	2.570	1.877E+00	TH234
					92.80	3.000	1.521E+00	TH234
186.24	301.	17.36	1.90	3.608E-02	185.99	3.280	1.842E+00	RA226
209.46	120.	27.26	1.38	3.427E-02				
238.74	1439.	3.27	1.30	3.188E-02	238.63	43.100	7.502E-01	PB212
241.70	285.	12.37	1.30	3.164E-02	241.00	3.900	1.656E+00	RA224
					241.92	7.470	8.692E-01	PB214
270.20	141.	23.84	2.02	2.945E-02				
295.34	405.	6.92	1.34	2.767E-02	295.22	19.200	5.461E-01	PB214
300.39	98.	21.41	1.34	2.733E-02				
328.62	114.	25.32	1.64	2.557E-02				
338.65	336.	11.41	1.53	2.499E-02	338.40	12.010	8.025E-01	AC228
352.17	713.	5.69	1.49	2.425E-02	351.99	37.100	5.697E-01	PB214
409.75	67.	28.79	1.11	2.153E-02				
462.85	101.	23.71	1.67	1.955E-02				
462.85	101.	23.71	1.67	1.955E-02	463.51	10.000	3.641E-01	SB125
510.91	229.	10.82	1.89	1.808E-02	510.72	22.500	3.483E-01	TL208
583.34	554.	5.45	1.81	1.629E-02	583.14	86.000	2.843E-01	TL208

609.45	528.	6.03	1.54	1.574E-02	609.32	46.090	5.232E-01	BI214
727.26	122.	16.74	1.35	1.374E-02	727.17	11.800	5.412E-01	BI212
794.50	105.	20.41	1.65	1.285E-02				
794.50	105.	20.41	1.65	1.285E-02	795.76	85.400	6.950E-02	CS134
911.48	410.	5.93	2.00	1.160E-02	911.07	29.000	8.738E-01	AC228
968.44	289.	10.34	2.10	1.110E-02	968.90	17.460	1.073E+00	AC228
1120.45	152.	15.16	1.59	9.969E-03	1120.28	15.040	7.278E-01	BI214
1461.07	1508.	2.66	2.21	8.190E-03	1460.75	10.700	1.243E+01	K40
1621.30	20.	30.79	0.75	7.569E-03	1620.56	2.750	7.136E-01	BI212

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
1764.95	115.	10.03	1.60	7.082E-03	1764.51	15.920	7.344E-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
167.64	84.15	652.	118.	0.059	96.06	1.184	TA-182 lD
178.92	89.79	682.	185.	0.093	63.75	1.189	PB-214 lD
418.55	209.46	456.	120.	0.060	81.79	1.381	AC-228
540.02	270.20	379.	141.	0.070	71.52	2.015	AC-228 s
600.42	300.40	300.	96.	0.048	90.89	1.299	PB-212 M
656.86	328.62	267.	114.	0.057	75.96	1.643	RH-106M s
819.11	409.75	131.	67.	0.033	86.36	1.111	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	859.	391.	0.196	34.83	1.178D
PB-212	153.89	77.11	881.	553.	0.276	20.29	1.179A
EU-155	174.13	87.23	1748.	154.	0.077	117.45	1.500s
TH-234	185.73	93.03	1471.	195.	0.098	77.89	1.500s
RA-226	372.13	186.24	838.	301.	0.151	52.07	1.902s
TH-227	471.50	235.93	1293.	-149.	-0.075	105.39	1.500s
PB-212	476.89	238.63	337.	1420.	0.710	9.53	1.297D
RA-224	480.69	240.53	407.	85.	0.043	102.74	1.500
PB-214	483.47	241.92	477.	286.	0.143	36.67	1.299D
PB-214	590.32	295.35	249.	404.	0.202	22.61	1.397
AC-228	676.92	338.65	357.	333.	0.166	34.24	1.534s
PB-214	703.95	352.17	305.	708.	0.354	17.07	1.489
SB-125	925.81	463.11	170.	79.	0.039	75.08	1.500s
TL-208	1021.41	510.91	176.	196.	0.098	32.45	1.892s
TL-208	1166.25	583.34	132.	550.	0.275	16.35	1.805
BI-214	1218.49	609.45	156.	524.	0.262	18.09	1.538
BI-212	1454.08	727.26	104.	121.	0.061	50.23	1.346
CS-134	1589.92	795.18	80.	65.	0.033	68.60	1.684s
AC-228	1822.52	911.48	69.	406.	0.203	17.79	2.005
AC-228	1936.45	968.44	146.	287.	0.143	31.03	2.095s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
BI-214	2240.48	1120.45	108.	151.	0.075	45.49	1.589
K-40	2921.74	1461.07	33.	1503.	0.752	7.99	2.210
BI-212	3242.21	1621.30	9.	20.	0.010	92.36	0.749s
BI-214	3529.56	1764.95	5.	114.	0.057	30.08	1.596s

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		-3.2930E-02					
			477.56	-3.293E-02	&(	2.341E-01 6.88E-02	G
K-40		1.2428E+01					
			1460.75	1.243E+01	(P	2.428E-01 3.32E-01	G
MN-54		5.0754E-03					
			834.81	5.075E-03	&(P	2.536E-02 7.41E-03	G
CO-57		-7.4616E-03					
			122.07	-7.462E-03	%(P	3.745E-02 1.13E-02	G K
			136.43	7.697E-03	% P	2.802E-01 8.36E-02	G
CO-60		8.5292E-03					
			1332.51	8.529E-03	%(P	2.526E-02 7.30E-03	G K
			1173.23	6.302E-03	& P	3.454E-02 9.98E-03	G K
Sr-85		-1.8841E-02					
			514.00	-1.884E-02	&(	3.787E-02 1.15E-02	G
Kr-85		-4.3963E+02					
			513.99	-4.396E+02	&(P	8.309E+02 2.51E+02	G
Y-88		3.1031E-03					
			1836.01	3.103E-03	&(P	1.663E-02 4.43E-03	G K
			898.02	-1.217E-04	& P	3.512E-02 1.01E-02	G
NB-94		4.9229E-04					
			871.10	4.923E-04	&(P	2.181E-02 6.14E-03	G K
			702.50	4.991E-03	& P	3.002E-02 8.83E-03	G K
Ag-108M		-1.3972E-02					
			722.95	-1.397E-02	%(	3.988E-02 1.20E-02	G K
			614.37	-1.178E-02	%	3.375E-02 1.01E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
		433.93	8.784E-03	& P	2.544E-02	7.61E-03	G
CD-109	5.3642E-02						
		88.04	5.364E-02	%(P	1.203E+00	3.61E-01	G
SN-113	-7.4182E-03						
		391.71	-7.418E-03	%(P	4.168E-02	1.23E-02	G K
		255.04	3.021E-01	%	1.337E+00	4.01E-01	G
SB-125	8.3254E-02						
		427.95	1.234E-02	&(P	7.625E-02	2.25E-02	G K
		600.77	5.845E-02	% P	1.203E-01	3.64E-02	G
		636.15	-2.549E-03	% P	2.257E-01	6.48E-02	G
		463.51	2.932E-01	*(P	2.365E-01	7.60E-02	G
		176.29	8.912E-02	& P	4.047E-01	1.21E-01	G
I-131	8.1349E-03						
		364.48	8.135E-03	&(	4.160E-02	1.23E-02	G K
		636.97	6.698E-03	%	5.730E-01	1.66E-01	G
		284.29	-1.551E-01	%	6.429E-01	1.92E-01	G
CS-134	1.9751E-02						
		604.66	-7.664E-04	&(P	6.807E-02	2.03E-02	G K
		795.76	4.320E-02	*(P	2.951E-02	9.96E-03	G
		569.29	-3.087E-03	%	1.848E-01	5.38E-02	G
		801.84	-3.441E-02	& P	2.967E-01	8.58E-02	G
CS-137	1.3248E-03						
		661.62	1.325E-03	&(P	3.221E-02	9.27E-03	G
CE-139	7.0658E-03						
		165.85	7.066E-03	%(P	3.626E-02	1.09E-02	G
EU-152	-4.3011E-03						
		121.78	-4.301E-03	%(P	1.063E-01	3.18E-02	G K
		344.30	-1.686E-02	& P	9.693E-02	2.88E-02	G
		1408.08	7.589E-02	% P	1.063E-01	3.37E-02	G
		964.00	1.297E-02	% P	2.762E-01	8.05E-02	G
		1112.07	7.921E-02	& P	2.145E-01	6.40E-02	G
		778.90	1.820E-02	& P	2.132E-01	6.17E-02	G
EU-154	-1.1123E-02						
		123.10	-1.112E-02	%(P	7.496E-02	2.25E-02	G K
		1274.80	-1.959E-02	% P	8.892E-02	2.59E-02	G
		723.30	-6.682E-02	% P	1.920E-01	5.75E-02	G
		1004.80	-1.751E-02	% P	1.826E-01	5.28E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
EU-155	1.0421E-01						
		86.45	1.042E-01	(	1.334E-01	4.08E-02	G K
		105.31	4.078E-02	& P	1.522E-01	4.58E-02	G
HG-203	-7.7722E-04						
		279.17	-7.772E-04	&(P	3.330E-02	9.82E-03	G K
		72.87	-2.423E-01	% P	8.944E-01	2.70E-01	G
		70.83	2.905E-02	&	1.551E+00	4.64E-01	G
		82.50	-6.702E-01	%	1.887E+00	5.70E-01	G
TL-208	2.8429E-01						
		583.14	2.843E-01	(P	2.913E-02	1.56E-02	G
		510.72	3.483E-01	+ P	1.151E-01	4.42E-02	G
PB-212	7.7374E-01						
		238.63	7.484E-01	(P	4.652E-02	2.40E-02	G K
							Energy duplication
		77.11	7.737E-01	}	1.974E-01	5.23E-02	G
		74.81	1.037E+00	+ P	3.689E-01	1.22E-01	G
PB-214	5.6312E-01						
		351.99	5.697E-01	(P	6.775E-02	3.27E-02	G K
		295.22	5.504E-01	(P	1.040E-01	4.20E-02	G
							Energy duplication
		77.11	8.783E-02	} P	4.199E-01	1.24E-01	G
		241.92	8.783E-01	+ P	3.203E-01	1.08E-01	G
BI-212	5.7374E-01						
		727.17	5.412E-01	(P	2.243E-01	9.16E-02	G K
		1620.56	7.136E-01	(P	5.674E-01	2.25E-01	G
		785.42	8.026E-01	% P	1.298E+00	3.99E-01	G
BI-214	5.2318E-01						
		609.32	5.232E-01	(P	6.086E-02	3.18E-02	G K
		1764.51	7.344E-01	+ P	8.230E-02	7.42E-02	G
		1120.28	7.278E-01	+ P	2.475E-01	1.11E-01	G
RA-224	4.9923E-01						
		241.00	4.992E-01	(P	5.666E-01	1.75E-01	G
RA-226	1.8425E+00						
		185.99	1.842E+00	*(	8.420E-01	3.20E-01	G
AC-228	8.5294E-01						
		911.07	8.738E-01	(P	8.917E-02	5.24E-02	G K
		968.90	1.073E+00	+ P	2.210E-01	1.12E-01	G
		338.40	8.025E-01	*(P	2.191E-01	9.25E-02	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments

TH-227      -3.0046E-01
                          236.00-3.005E-01 &(P 3.431E-01 1.05E-01 G K
                          256.25 1.140E-01 % P 3.797E-01 1.14E-01 G

PA-234       2.9930E-02
                           98.44 2.993E-02 &(  1.306E-01 3.93E-02 G K
                          946.00 0.000E+00 %   1.590E-01 4.56E-02 G
                          131.28-5.395E-02 %   1.579E-01 4.77E-02 G
                           94.67-1.298E-01 %   2.441E-01 7.42E-02 G
                          883.24 2.680E-02 %   1.939E-01 5.59E-02 G
                          926.70-4.377E-02 %   2.866E-01 8.38E-02 G
                          569.26-4.558E-03 %   2.728E-01 7.95E-02 G

TH-234       1.1894E+00
                           63.29 1.049E+00 %(P 1.573E+00 4.79E-01 G K
                           92.80 1.372E+00  (P 1.274E+00 3.92E-01 G
                           92.38-1.268E-01 % P 1.519E+00 4.53E-01 G

AM-241      -3.8211E-02
                           59.54-3.821E-02 %(P 1.749E-01 5.25E-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	-3.0797E-02	-3.2930E-02	2.0626E-01	2.0627E-01	2.189E-01
K-40		1.2428E+01	1.2428E+01	9.9655E-01	1.2377E+00	
MN-54	#A	5.0176E-03	5.0754E-03	2.2218E-02	2.2220E-02	2.508E-02
CO-57	#B	-7.3634E-03	-7.4616E-03	3.4323E-02	3.4325E-02	3.695E-02
CO-60	#B	8.5133E-03	8.5292E-03	2.1893E-02	2.1899E-02	2.521E-02
Sr-85	#A	-1.7830E-02	-1.8841E-02	3.4489E-02	3.4507E-02	3.584E-02
Kr-85	#A	-4.3961E+02	-4.3963E+02	8.5609E+02	8.5649E+02	8.308E+02
Y-88	#B	3.0007E-03	3.1031E-03	1.3277E-02	1.3279E-02	1.608E-02
NB-94	#B	4.9229E-04	4.9229E-04	1.8426E-02	1.8426E-02	2.181E-02
Ag-108M	#B	-1.3971E-02	-1.3972E-02	3.5905E-02	3.5914E-02	3.987E-02
CD-109	#A	5.3221E-02	5.3642E-02	1.0825E+00	1.0825E+00	1.194E+00
SN-113	#B	-7.1912E-03	-7.4182E-03	4.7760E-02	4.7762E-02	4.040E-02
SB-125	#F	8.2960E-02	8.3254E-02	6.4742E-02	6.4928E-02	7.598E-02
I-131	#B	5.2140E-03	8.1349E-03	3.7004E-02	3.7007E-02	2.666E-02
CS-134	#B	1.9657E-02	1.9751E-02	1.3659E-02	1.3709E-02	6.775E-02
CS-137	#A	1.3243E-03	1.3248E-03	2.7823E-02	2.7823E-02	3.220E-02
CE-139	#A	6.8844E-03	7.0658E-03	3.2638E-02	3.2641E-02	3.533E-02
EU-152	#B	-4.2978E-03	-4.3011E-03	9.9350E-02	9.9350E-02	1.062E-01
EU-154	#B	-1.1111E-02	-1.1123E-02	7.0577E-02	7.0580E-02	7.488E-02
EU-155	#A	1.0401E-01	1.0421E-01	1.2240E-01	1.2253E-01	1.331E-01
HG-203	#B	-7.1979E-04	-7.7722E-04	1.0314E-01	1.0314E-01	3.084E-02
TL-208		2.8429E-01	2.8429E-01	4.6860E-02	4.9777E-02	
PB-212		7.7374E-01	7.7374E-01	7.4526E-02	8.7420E-02	
PB-214		5.6312E-01	5.6312E-01	8.0547E-02	8.7143E-02	
BI-212		5.7374E-01	5.7374E-01	2.9123E-01	2.9320E-01	
BI-214		5.2318E-01	5.2318E-01	9.5402E-02	1.0028E-01	
RA-224	A	4.9923E-01	4.9923E-01	5.2637E-01	5.2720E-01	5.666E-01
RA-226	#	1.8425E+00	1.8425E+00	9.5934E-01	9.6549E-01	
AC-228		8.5294E-01	8.5294E-01	1.5331E-01	1.6138E-01	
TH-227	#A	-3.0046E-01	-3.0046E-01	3.1723E-01	3.1773E-01	3.431E-01
PA-234	#B	2.9930E-02	2.9930E-02	1.1779E-01	1.1780E-01	1.306E-01
TH-234	#B	1.1894E+00	1.1894E+00	9.6054E-01	9.6280E-01	1.573E+00
AM-241	#A	-3.8210E-02	-3.8211E-02	1.6412E-01	1.6413E-01	1.749E-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) 1.8340900E+01 pCi/gm
Total Decayed Activity (270.2 to 2000.1 keV) 1.8340912E+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_9AUG2006_1811.An1

Sample description
FSS-OOL-10-02-014-F

Spectrum Filename: C:\GammaVision\Spectra\107F_9AUG2006_1811.An1

Acquisition information
Start time: 09-Aug-2006 18:11:27
Live time: 2000
Real time: 2004
Dead time: 0.20 %
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: 1.8230E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.8230E+03) =
5.4855E+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	07-Aug-2006 13:25:00
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. 22 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.1934

***** 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
63.44	205.	31.53	1.30	2.029E-02	63.29	3.900	PBC<MDA	TH234
74.94	366.	19.33	1.50	2.849E-02				
74.94	366.	19.33	1.50	2.849E-02	74.81	9.600	9.928E-01	PB212
77.02	669.	10.27	1.50	2.957E-02	77.11	17.500	9.583E-01	PB212
					77.11	10.700	1.556E+00	PB214
77.02	664.	10.27	1.50	2.957E-02	77.11	17.500	9.515E-01	PB212
					77.11	10.700	1.556E+00	PB214
87.39	276.	15.13	1.19	3.321E-02	86.45	32.740	1.905E-01	EU155
					88.04	3.790	1.627E+00	CD109
89.73	196.	20.50	1.19	3.379E-02				
93.18	209.	19.40	1.19	3.456E-02	92.38	2.570	1.687E+00	TH234
					92.80	3.000	PBC<MDA	TH234
					94.67	15.500	2.869E-01	PA234
128.98	115.	38.95	0.59	3.818E-02				
186.31	294.	15.73	1.73	3.608E-02	185.99	3.280	1.840E+00	RA226
209.49	143.	23.81	1.29	3.427E-02				
238.78	1600.	3.12	1.30	3.189E-02	238.63	43.100	8.544E-01	PB212
241.75	280.	13.51	1.30	3.165E-02	241.00	3.900	1.663E+00	RA224
					241.92	7.470	8.727E-01	PB214
295.43	431.	6.98	1.34	2.767E-02	295.22	19.200	5.952E-01	PB214
300.34	109.	20.55	1.34	2.734E-02				
328.49	123.	27.68	1.56	2.557E-02				
339.02	329.	10.58	1.55	2.497E-02	338.40	12.010	8.042E-01	AC228
352.05	874.	5.36	1.54	2.426E-02	351.99	37.100	7.153E-01	PB214
463.15	147.	15.93	1.12	1.954E-02				
463.15	147.	15.93	1.12	1.954E-02	463.51	10.000	5.497E-01	SB125
510.97	282.	13.04	1.64	1.807E-02	510.72	22.500	4.518E-01	TL208

583.27	577.	6.35	1.53	1.629E-02	583.14	86.000	3.031E-01	TL208
609.47	621.	6.63	1.61	1.574E-02	609.32	46.090	6.302E-01	BI214
727.36	143.	18.65	1.37	1.374E-02	727.17	11.800	6.482E-01	BI212
770.06	147.	18.18	1.58	1.316E-02				
795.33	75.	21.92	1.74	1.284E-02				
795.33	75.	21.92	1.74	1.284E-02	795.76	85.400	5.018E-02	CS134
860.84	104.	20.57	1.55	1.211E-02				
911.43	446.	7.46	2.24	1.160E-02	911.07	29.000	9.728E-01	AC228
968.57	293.	9.36	1.84	1.110E-02	968.90	17.460	1.111E+00	AC228

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
1120.48	197.	14.48	1.51	9.969E-03	1120.28	15.040	9.675E-01	BI214
1155.21	36.	41.46	0.72	9.748E-03				
1461.12	1551.	2.58	2.40	8.189E-03	1460.75	10.700	1.307E+01	K40
1620.83	43.	21.11	0.62	7.569E-03	1620.56	2.750	1.521E+00	BI212
1764.90	117.	9.58	2.21	7.082E-03	1764.51	15.920	7.606E-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	
126.54	63.44	1465.	205.	0.102	94.59	1.305	PA-234	l
180.00	90.17	721.	186.	0.093	65.14	1.189	PB-214	D
186.91	93.62	756.	167.	0.084	73.50	1.192	U-235	D
257.61	128.98	844.	134.	0.067	95.27	0.588	AC-228	s
418.62	209.49	484.	143.	0.072	71.43	1.286	AC-228	s
477.20	238.73	447.	1597.	0.798	9.38	1.297	PB-212	D
600.18	300.28	225.	100.	0.050	70.36	1.621	PB-212	s
656.60	328.49	373.	123.	0.062	83.04	1.562	RH-106M	s
1539.69	770.06	145.	150.	0.075	41.98	1.584	BI-214	sM
1721.24	860.84	93.	105.	0.053	48.52	1.548	TL-208	s
2310.00	1155.21	74.	36.	0.018	124.38	0.720	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	149.56	74.94	2378.	366.	0.183	57.98	1.500s
PB-212	153.89	77.11	2027.	669.	0.335	30.82	1.500D
PB-214	153.89	77.11	2032.	664.	0.332	30.82	1.500D
EU-155	174.15	87.24	1795.	239.	0.120	77.57	1.500
CD-109	175.74	88.04	908.	153.	0.077	86.68	1.187D
TH-234	185.81	93.07	1735.	145.	0.072	109.21	1.500s
RA-226	372.27	186.31	738.	294.	0.147	47.19	1.730s
TH-227	471.88	236.12	1610.	-173.	-0.087	101.14	1.500s
PB-212	477.14	238.75	1162.	1559.	0.779	11.85	1.500s
RA-224	481.63	241.00	1632.	237.	0.118	74.31	1.299D
PB-214	590.42	295.40	460.	441.	0.220	24.80	1.500s
AC-228	677.66	339.02	318.	326.	0.163	31.73	1.549s
PB-214	703.74	352.06	314.	764.	0.382	14.53	1.500

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
SB-125	925.84	463.12	136.	117.	0.058	49.31	1.500s
TL-208	1021.54	510.97	294.	248.	0.124	39.13	1.640s
TL-208	1166.13	583.27	206.	573.	0.286	19.04	1.530s
BI-214	1218.52	609.47	249.	617.	0.308	19.90	1.605
BI-212	1454.29	727.36	155.	142.	0.071	55.96	1.374s
CS-134	1589.54	794.99	79.	61.	0.030	72.33	1.684s
AC-228	1822.42	911.43	151.	442.	0.221	22.39	2.243s
AC-228	1936.70	968.57	123.	290.	0.145	28.08	1.836
BI-214	2240.53	1120.48	140.	196.	0.098	43.43	1.510
K-40	2921.83	1461.12	19.	1546.	0.773	7.74	2.400
BI-212	3241.28	1620.83	11.	43.	0.021	63.33	0.618s
BI-214	3529.46	1764.90	3.	116.	0.058	28.74	2.209

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		-2.4176E-02					
			477.56	-2.418E-02	%(	2.499E-01 7.33E-02	G
K-40		1.3075E+01					
			1460.75	1.307E+01	(P	1.953E-01 3.38E-01	G
MN-54		-2.4482E-03					
			834.81	-2.448E-03	&(P	3.642E-02 1.06E-02	G
CO-57		1.0221E-02					
			122.07	1.022E-02	&(P	3.768E-02 1.13E-02	G K
			136.43	-4.796E-02	% P	3.069E-01 9.21E-02	G
CO-60		1.0521E-02					
			1332.51	1.052E-02	%(P	2.856E-02 8.35E-03	G K
			1173.23	-3.207E-03	& P	4.500E-02 1.28E-02	G K
Sr-85		-1.4752E-02					
			514.00	-1.475E-02	%(	3.799E-02 1.15E-02	G
Kr-85		-3.6145E+02					
			513.99	-3.614E+02	%(P	8.602E+02 2.58E+02	G
Y-88		2.8309E-03					
			1836.01	2.831E-03	%(P	2.491E-02 6.81E-03	G K
			898.02	-7.508E-03	& P	3.359E-02 9.78E-03	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
NB-94	-5.7011E-03						
		871.10	-5.701E-03	%(P	2.718E-02	7.95E-03	G K
		702.50	5.464E-03	% P	3.010E-02	8.86E-03	G K
Ag-108M	-1.0617E-02						
		722.95	-1.062E-02	&(	4.130E-02	1.23E-02	G K
		614.37	-2.836E-02	%	4.091E-02	1.26E-02	G
		433.93	2.462E-04	& P	2.507E-02	7.27E-03	G
CD-109	9.0404E-01						
		88.04	9.040E-01	(P	8.443E-01	2.62E-01	G
SN-113	-3.9284E-04						
		391.71	-3.928E-04	&(P	4.803E-02	1.41E-02	G K
		255.04	-1.454E-01	&	1.377E+00	4.10E-01	G
SB-125	9.2941E-02						
		427.95	-2.562E-02	%(P	9.010E-02	2.68E-02	G K
		600.77	-3.469E-03	% P	1.490E-01	4.29E-02	G
		636.15	1.581E-04	% P	1.966E-01	5.60E-02	G
		463.51	4.439E-01	*(P	2.170E-01	7.47E-02	G
		176.29	-5.873E-02	% P	4.930E-01	1.47E-01	G
I-131	9.8889E-03						
		364.48	9.889E-03	%(	3.644E-02	1.09E-02	G K
		636.97	1.018E-01	%	4.402E-01	1.30E-01	G
		284.29	-2.259E-02	&	5.614E-01	1.66E-01	G
CS-134	1.9882E-02						
		604.66	1.339E-03	%(P	7.321E-02	2.18E-02	G K
		795.76	4.107E-02	*(P	2.984E-02	9.99E-03	G
		569.29	3.375E-02	&	1.779E-01	5.25E-02	G
		801.84	-1.782E-03	% P	4.326E-01	1.26E-01	G
CS-137	-5.4808E-03						
		661.62	-5.481E-03	&(P	3.807E-02	1.10E-02	G
CE-139	4.6535E-03						
		165.85	4.653E-03	%(P	3.921E-02	1.17E-02	G
EU-152	3.2081E-02						
		121.78	3.208E-02	&(P	1.120E-01	3.38E-02	G K
		344.30	-4.083E-02	% P	1.089E-01	3.28E-02	G
		1408.08	5.184E-02	% P	1.288E-01	3.84E-02	G
		964.00	3.923E-03	& P	2.977E-01	8.67E-02	G
		1112.07	-6.981E-02	% P	2.855E-01	8.42E-02	G
		778.90	-6.176E-02	% P	2.408E-01	7.12E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
EU-154	-3.3147E-04						
		123.10	-3.315E-04	%(P	8.171E-02	2.44E-02	G K
		1274.80	2.166E-02	& P	1.003E-01	2.94E-02	G
		723.30	-5.802E-02	& P	1.925E-01	5.75E-02	G
		1004.80	-6.004E-02	% P	1.793E-01	5.34E-02	G
EU-155	1.6514E-01						
		86.45	1.651E-01	&(	1.381E-01	4.27E-02	G K
		105.31	7.168E-02	% P	1.627E-01	4.93E-02	G
HG-203	-1.5009E-02						
		279.17	-1.501E-02	&(P	3.822E-02	1.15E-02	G K
		72.87	-4.418E-01	& P	1.096E+00	3.32E-01	G
		70.83	-2.647E-02	&	2.166E+00	6.51E-01	G
		82.50	-6.294E-01	%	2.222E+00	6.71E-01	G
TL-208	3.0312E-01						
		583.14	3.031E-01	*(P	3.684E-02	1.94E-02	G
		510.72	4.518E-01	+ P	1.505E-01	6.70E-02	G
PB-212	8.9077E-01						
		238.63	8.406E-01	*(P	8.712E-02	3.35E-02	G K
							Energy duplication
		77.11	9.583E-01	*(	3.044E-01	9.84E-02	G
		74.81	9.928E-01	&(P	6.232E-01	1.94E-01	G
PB-214	6.2416E-01						
		351.99	6.289E-01	(P	7.021E-02	3.07E-02	G K
		295.22	6.150E-01	(P	1.431E-01	5.14E-02	G
							Energy duplication
		77.11	1.556E+00	+ P	4.984E-01	1.61E-01	G
		241.92	8.675E-02	% P	5.977E-01	1.80E-01	G
BI-212	6.4825E-01						
		727.17	6.482E-01	*(P	2.778E-01	1.22E-01	G K
		1620.56	1.521E+00	+ P	6.544E-01	3.25E-01	G
		785.42	6.078E-01	% P	1.575E+00	4.72E-01	G
BI-214	6.3025E-01						
		609.32	6.302E-01	(P	7.792E-02	4.21E-02	G K
		1764.51	7.606E-01	+ P	7.343E-02	7.34E-02	G
		1120.28	9.675E-01	+ P	2.863E-01	1.41E-01	G
RA-224	1.4184E+00						
		241.00	1.418E+00	(P	1.145E+00	3.55E-01	G
RA-226	1.8405E+00						
		185.99	1.840E+00	*(	8.095E-01	2.90E-01	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments

AC-228       1.0249E+00
                          911.07 9.728E-01  (P 1.322E-01 7.33E-02 G K
                          968.90 1.111E+00  (P 2.079E-01 1.05E-01 G
                          338.40 8.042E-01 - P 2.119E-01 8.60E-02 G

TH-227      -3.5674E-01
                          236.00-3.567E-01 ?(P 3.911E-01 1.20E-01 G K
                          256.25 5.086E-02 & P 3.950E-01 1.18E-01 G

PA-234       2.3144E-03
                           98.44 2.314E-03 %(  1.413E-01 4.22E-02 G K
                          946.00 4.297E-02 %   1.420E-01 4.21E-02 G
                          131.28-4.547E-02 &   1.684E-01 5.07E-02 G
                           94.67 3.355E-03 %   2.566E-01 7.68E-02 G
                          883.24 4.214E-02 &   2.215E-01 6.47E-02 G
                          926.70 6.727E-02 &   2.462E-01 7.27E-02 G
                          569.26 5.268E-02 &   2.566E-01 7.59E-02 G

TH-234       1.0359E+00
                           63.29 1.031E+00 %(P 1.795E+00 5.45E-01 G K
                           92.80 1.042E+00 *(P 1.414E+00 4.31E-01 G
                           92.38-2.640E-01 & P 1.684E+00 5.05E-01 G

AM-241      -5.0974E-02
                           59.54-5.097E-02 %(P 2.353E-01 7.08E-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
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	-2.3496E-02	-2.4176E-02	2.1985E-01	2.1985E-01	2.428E-01
K-40		1.3075E+01	1.3075E+01	1.0148E+00	1.2752E+00	
MN-54	#A	-2.4363E-03	-2.4482E-03	3.9316E-02	3.9316E-02	3.625E-02
CO-57	#B	1.0164E-02	1.0221E-02	3.4047E-02	3.4051E-02	3.747E-02
CO-60	#B	1.0513E-02	1.0521E-02	2.5057E-02	2.5064E-02	2.854E-02
Sr-85	#A	-1.4410E-02	-1.4752E-02	3.4367E-02	3.4378E-02	3.710E-02
Kr-85	#A	-3.6144E+02	-3.6145E+02	9.0851E+02	9.0876E+02	8.602E+02
Y-88	#B	2.7907E-03	2.8309E-03	2.0437E-02	2.0437E-02	2.456E-02
NB-94	#B	-5.7011E-03	-5.7011E-03	2.4576E-02	2.4578E-02	2.718E-02
Ag-108M	#B	-1.0616E-02	-1.0617E-02	3.6909E-02	3.6914E-02	4.129E-02
CD-109		9.0101E-01	9.0404E-01	7.8522E-01	7.8682E-01	
SN-113	#B	-3.8767E-04	-3.9284E-04	1.0196E-01	1.0196E-01	4.740E-02
SB-125	#F	9.2801E-02	9.2941E-02	4.6935E-02	4.7255E-02	8.997E-02
I-131	#B	8.1812E-03	9.8889E-03	3.2664E-02	3.2670E-02	3.015E-02
CS-134	#B	1.9842E-02	1.9882E-02	1.4507E-02	1.4554E-02	7.306E-02
CS-137	#A	-5.4800E-03	-5.4808E-03	7.4134E-02	7.4135E-02	3.806E-02
CE-139	#A	4.6022E-03	4.6535E-03	3.5226E-02	3.5227E-02	3.878E-02
EU-152	#B	3.2070E-02	3.2081E-02	1.0130E-01	1.0131E-01	1.120E-01
EU-154	#B	-3.3131E-04	-3.3147E-04	6.1465E-01	6.1465E-01	8.167E-02
EU-155	#	1.6500E-01	1.6514E-01	1.2809E-01	1.2842E-01	1.380E-01
HG-203	#B	-1.4526E-02	-1.5009E-02	3.6583E-02	3.6594E-02	3.699E-02
TL-208	#	3.0312E-01	3.0312E-01	5.8184E-02	6.0875E-02	
PB-212	#	8.9077E-01	8.9077E-01	1.0660E-01	1.1888E-01	8.712E-02
PB-214	#	6.2416E-01	6.2416E-01	9.0539E-02	9.7756E-02	7.021E-02
BI-212		6.4825E-01	6.4825E-01	3.6606E-01	3.6805E-01	
BI-214		6.3025E-01	6.3025E-01	1.2631E-01	1.3168E-01	
RA-224		1.4184E+00	1.4184E+00	1.0639E+00	1.0672E+00	
RA-226	#	1.8405E+00	1.8405E+00	8.6858E-01	8.7535E-01	
AC-228		1.0249E+00	1.0249E+00	1.8558E-01	1.9520E-01	
TH-227	#A	-3.5674E-01	-3.5674E-01	3.6138E-01	3.6199E-01	3.911E-01
PA-234	#B	2.3144E-03	2.3144E-03	1.2666E-01	1.2666E-01	1.413E-01
TH-234	#B	1.0359E+00	1.0359E+00	1.0422E+00	1.0438E+00	1.795E+00
AM-241	#A	-5.0974E-02	-5.0974E-02	2.1928E-01	2.1930E-01	2.353E-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) 1.9841135E+01 pCi/gm
Total Decayed Activity (295.2 to 2000.1 keV) 1.9844175E+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_9AUG2006_1848.An1

Sample description
FSS-OOL-10-02-015-F

Spectrum Filename: C:\GammaVision\Spectra\107F_9AUG2006_1848.An1

Acquisition information
Start time: 09-Aug-2006 18:48:11
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: 1.2330E+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%
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	04-Aug-2006 16:15:00
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. 18 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.1561

***** 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
74.61	234.	13.93	1.18	2.842E-02				
74.61	234.	13.93	1.18	2.842E-02	74.81	9.600	9.229E-01	PB212
77.16	342.	10.31	1.18	2.962E-02	77.11	10.700	1.169E+00	PB214
					77.11	17.500	7.247E-01	PB212
86.93	209.	23.82	1.70	3.297E-02	86.45	32.740	2.139E-01	EU155
					88.04	3.790	1.832E+00	CD109
93.22	130.	23.53	1.37	3.447E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
185.36	171.	21.23	1.72	3.615E-02	185.99	3.280	1.580E+00	RA226
209.18	120.	31.36	1.95	3.429E-02				
238.82	919.	4.19	1.30	3.189E-02	238.63	43.100	7.200E-01	PB212
241.77	159.	17.25	1.30	3.165E-02	241.00	3.900	1.389E+00	RA224
					241.92	7.470	7.304E-01	PB214
270.58	96.	23.81	1.52	2.942E-02				
295.35	208.	10.19	1.54	2.767E-02	295.22	19.200	4.192E-01	PB214
301.26	100.	23.05	1.82	2.727E-02				
328.02	75.	22.19	2.01	2.560E-02				
338.48	193.	16.90	1.51	2.500E-02	338.40	12.010	6.908E-01	AC228
352.10	386.	7.41	1.60	2.425E-02	351.99	37.100	4.641E-01	PB214
463.30	66.	33.48	1.26	1.953E-02				
463.30	66.	33.48	1.26	1.953E-02	463.51	10.000	3.570E-01	SB125
510.88	202.	13.44	1.76	1.808E-02	510.72	22.500	4.530E-01	TL208
536.20	42.	40.41	1.15	1.740E-02				
583.33	299.	6.99	1.20	1.629E-02	583.14	86.000	2.301E-01	TL208
609.50	237.	10.37	1.40	1.574E-02	609.32	46.090	3.515E-01	BI214
661.45	116.	18.85	1.77	1.477E-02	661.62	84.620	9.821E-02	CS137
726.93	96.	18.74	2.08	1.375E-02	727.17	11.800	6.374E-01	BI212

794.35	52.	37.34	1.39	1.286E-02				
794.35	52.	37.34	1.39	1.286E-02	795.76	85.400	5.129E-02	CS134
860.30	74.	24.24	1.73	1.211E-02				
911.41	256.	8.70	2.29	1.160E-02	911.07	29.000	8.197E-01	AC228
968.26	147.	14.07	2.00	1.110E-02	968.90	17.460	8.192E-01	AC228
1120.55	53.	35.77	1.55	9.968E-03	1120.28	15.040	3.824E-01	BI214
1461.11	1200.	2.91	2.21	8.189E-03	1460.75	10.700	1.494E+01	K40
1764.84	69.	11.95	2.01	7.084E-03	1764.51	15.920	6.716E-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	74.67	415.	234.	0.117	41.78	1.178	BI-207	D
153.99	77.22	451.	342.	0.171	30.92	1.179	BI-207	D
418.00	209.18	432.	120.	0.060	94.07	1.949	AC-228	s
477.27	238.74	280.	919.	0.459	12.56	1.297	PB-212	D
483.18	241.70	296.	159.	0.079	51.74	1.299	PB-214	D
540.79	270.58	186.	96.	0.048	71.44	1.517	AC-228	
602.13	301.26	155.	100.	0.050	69.16	1.818	PB-212	s
655.66	328.02	97.	75.	0.038	66.57	2.007	AC-228	s
1071.99	536.20	82.	42.	0.021	121.22	1.149	BA-140	s
1720.16	860.30	64.	74.	0.037	72.72	1.733	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	149.05	74.69	1056.	197.	0.099	71.66	1.500s
PB-214	153.89	77.11	914.	308.	0.154	44.35	1.500D
PB-212	153.89	77.11	909.	312.	0.156	44.35	1.500D
EU-155	173.97	87.15	894.	106.	0.053	123.33	1.500s
TH-234	185.68	93.01	733.	150.	0.075	70.69	1.500
RA-226	370.37	185.36	423.	171.	0.085	63.70	1.723s
PB-212	477.21	238.79	549.	904.	0.452	14.53	1.500s
PB-214	590.41	295.39	166.	196.	0.098	34.19	1.500
AC-228	676.58	338.48	251.	189.	0.095	50.71	1.513
PB-214	703.81	352.10	156.	347.	0.173	21.79	1.500s
TL-208	1021.35	510.88	164.	168.	0.084	40.32	1.763s
TL-208	1166.24	583.33	67.	294.	0.147	20.98	1.202
BI-214	1218.57	609.50	109.	233.	0.116	31.12	1.404
CS-137	1322.47	661.45	106.	112.	0.056	56.56	1.767s
BI-212	1453.44	726.93	72.	94.	0.047	56.21	2.076s
CS-134	1590.14	795.29	60.	33.	0.017	109.08	1.684s
AC-228	1822.38	911.41	64.	252.	0.126	26.10	2.290s
AC-228	1936.09	968.26	80.	145.	0.072	42.21	1.998
BI-214	2240.66	1120.55	87.	52.	0.026	107.30	1.547
K-40	2921.81	1461.11	9.	1195.	0.597	8.74	2.214

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
BI-214	3529.33	1764.84	1.	69.	0.035	35.86	2.014

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		4.3076E-02					
			477.56	4.308E-02	%(	2.251E-01 6.54E-02	G
K-40		1.4943E+01					
			1460.75	1.494E+01	(P	2.090E-01 4.37E-01	G
MN-54		-6.5177E-04					
			834.81	-6.518E-04	%(P	3.714E-02 1.05E-02	G
CO-57		4.9807E-03					
			122.07	4.981E-03	&(P	3.718E-02 1.11E-02	G K
			136.43	-2.818E-02	% P	2.941E-01 8.74E-02	G
CO-60		3.8148E-04					
			1332.51	3.815E-04	%(P	3.848E-02 1.04E-02	G K
			1173.23	2.188E-03	% P	4.437E-02 1.24E-02	G K
Sr-85		-2.8219E-02					
			514.00	-2.822E-02	&(	4.680E-02 1.43E-02	G
Kr-85		-6.5929E+02					
			513.99	-6.593E+02	&(P	1.030E+03 3.13E+02	G
Y-88		-1.3512E-03					
			1836.01	-1.351E-03	%(P	1.224E-02 1.66E-03	G K
			898.02	1.046E-02	% P	3.209E-02 9.39E-03	G
NB-94		5.9388E-03					
			871.10	5.939E-03	&(P	3.085E-02 8.92E-03	G K
			702.50	-6.776E-04	& P	3.309E-02 9.38E-03	G K
Ag-108M		-1.6158E-02					
			722.95	-1.616E-02	%(	4.597E-02 1.38E-02	G K
			614.37	-4.551E-03	%	3.917E-02 1.14E-02	G
			433.93	3.393E-03	% P	3.480E-02 1.01E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CD-109	9.9783E-02						
		88.04	9.978E-02	&(P	1.346E+00	4.02E-01	G
SN-113	-1.5671E-02						
		391.71	-1.567E-02	%(P	4.482E-02	1.33E-02	G K
		255.04	4.737E-01	%	1.430E+00	4.29E-01	G
SB-125	-9.2541E-03						
		427.95	-9.254E-03	%(P	1.041E-01	3.02E-02	G K
		600.77	4.073E-02	% P	1.527E-01	4.48E-02	G
		636.15	1.042E-01	& P	2.261E-01	6.82E-02	G
		463.51	2.011E-01	% P	2.803E-01	8.67E-02	G
		176.29	9.188E-02	& P	4.373E-01	1.30E-01	G
I-131	4.4182E-03						
		364.48	4.418E-03	&(	4.555E-02	1.32E-02	G K
		636.97	2.720E-01	&	5.032E-01	1.54E-01	G
		284.29	9.099E-02	%	7.295E-01	2.15E-01	G
CS-134	1.6731E-02						
		604.66	1.985E-03	&(P	7.140E-02	2.11E-02	G K
		795.76	3.358E-02	@(P	3.892E-02	1.24E-02	G
		569.29	-1.455E-04	%	1.938E-01	5.53E-02	G
		801.84	-2.561E-02	% P	3.896E-01	1.11E-01	G
CS-137	9.8209E-02						
		661.62	9.821E-02	(P	4.447E-02	1.91E-02	G
CE-139	1.9490E-03						
		165.85	1.949E-03	&(P	3.839E-02	1.14E-02	G
EU-152	1.8062E-02						
		121.78	1.806E-02	%(P	1.096E-01	3.27E-02	G K
		344.30	1.800E-02	% P	9.745E-02	2.87E-02	G
		1408.08	-4.354E-03	% P	1.651E-01	4.45E-02	G
		964.00	-3.408E-03	& P	3.092E-01	8.83E-02	G
		1112.07	4.690E-02	& P	3.135E-01	9.04E-02	G
		778.90	-1.354E-03	% P	2.251E-01	6.27E-02	G
EU-154	6.8206E-03						
		123.10	6.821E-03	&(P	7.750E-02	2.30E-02	G K
		1274.80	1.460E-02	& P	1.186E-01	3.39E-02	G
		723.30	-4.330E-02	& P	1.161E-01	3.42E-02	G
		1004.80	-1.044E-02	& P	2.332E-01	6.63E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
EU-155	1.0813E-01						
		86.45	1.081E-01	*(	1.451E-01	4.45E-02	G K
		105.31	6.662E-02	% P	1.582E-01	4.78E-02	G
HG-203	2.6661E-03						
		279.17	2.666E-03	%(P	3.545E-02	1.04E-02	G K
		72.87	-3.300E-02	& P	1.273E+00	3.81E-01	G
		70.83	-1.170E+00	&	1.885E+00	5.75E-01	G
		82.50	-1.006E+00	%	2.483E+00	7.51E-01	G
TL-208	2.3005E-01						
		583.14	2.301E-01	(P	3.195E-02	1.63E-02	G
		510.72	4.530E-01	+ P	1.680E-01	7.31E-02	G
PB-212	7.1558E-01						
		238.63	7.211E-01	*(P	8.922E-02	3.55E-02	G K
							Energy duplication
		77.11	6.613E-01	*(	3.033E-01	9.78E-02	G
		74.81	7.898E-01	&(P	6.175E-01	1.92E-01	G
PB-214	4.1638E-01						
		351.99	4.226E-01	*(P	7.416E-02	3.11E-02	G K
		295.22	4.044E-01	(P	1.293E-01	4.72E-02	G
							Energy duplication
		77.11	1.065E+00	+ P	4.973E-01	1.60E-01	G
		241.92	1.164E-02	% P	6.507E-01	1.94E-01	G
BI-212	6.3741E-01						
		727.17	6.374E-01	(P	2.850E-01	1.21E-01	G K
		1620.56	-1.842E-01	% P	9.449E-01	2.55E-01	G
		785.42	4.261E-01	% P	1.742E+00	5.10E-01	G
BI-214	3.5907E-01						
		609.32	3.515E-01	(P	7.770E-02	3.71E-02	G K
		1764.51	6.716E-01	+ P	7.163E-02	8.13E-02	G
		1120.28	3.824E-01	(P	3.369E-01	1.39E-01	G
RA-224	6.9643E-01						
		241.00	6.964E-01	%(P	1.076E+00	3.28E-01	G
RA-226	1.5799E+00						
		185.99	1.580E+00	*(	9.125E-01	3.35E-01	G
AC-228	7.9306E-01						
		911.07	8.197E-01	@(P	1.304E-01	7.25E-02	G K
		968.90	8.192E-01	(P	2.516E-01	1.17E-01	G
		338.40	6.908E-01	(P	2.792E-01	1.19E-01	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments

TH-227      -2.8499E-01
                          236.00-2.850E-01 %(P 3.955E-01 1.21E-01 G K
                          256.25 1.361E-01 % P 4.105E-01 1.23E-01 G

PA-234       1.8311E-02
                           98.44 1.831E-02 %(  1.424E-01 4.25E-02 G K
                          946.00-1.824E-02 &   2.145E-01 6.18E-02 G
                          131.28 3.024E-02 &   1.583E-01 4.73E-02 G
                           94.67-9.188E-02 %   2.732E-01 8.24E-02 G
                          883.24 6.000E-02 %   2.829E-01 8.24E-02 G
                          926.70-5.136E-02 %   3.071E-01 8.86E-02 G
                          569.26-7.738E-04 %   2.602E-01 7.38E-02 G

TH-234       9.2212E-01
                           63.29 4.071E-01 %(P 1.749E+00 5.22E-01 G K
                           92.80 1.592E+00  (P 1.369E+00 4.24E-01 G
                           92.38-1.389E-01 % P 1.733E+00 5.14E-01 G

AM-241      -1.9468E-02
                           59.54-1.947E-02 &(P 2.345E-01 6.98E-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

- -

***** 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	4.0313E-02	4.3076E-02	1.9618E-01	1.9619E-01	2.106E-01
K-40		1.4943E+01	1.4943E+01	1.3117E+00	1.5810E+00	
MN-54	#A	-6.4442E-04	-6.5177E-04	1.2195E-01	1.2195E-01	3.672E-02
CO-57	#B	4.9158E-03	4.9807E-03	3.3236E-02	3.3237E-02	3.670E-02
CO-60	#B	3.8078E-04	3.8148E-04	3.1172E-02	3.1172E-02	3.841E-02
Sr-85	#A	-2.6720E-02	-2.8219E-02	4.2970E-02	4.3003E-02	4.431E-02
Kr-85	#A	-6.5927E+02	-6.5929E+02	1.0684E+03	1.0691E+03	1.030E+03
Y-88	#B	-1.3071E-03	-1.3512E-03	8.1072E-03	8.1076E-03	1.184E-02
NB-94	#B	5.9388E-03	5.9388E-03	2.6746E-02	2.6749E-02	3.085E-02
Ag-108M	#B	-1.6157E-02	-1.6158E-02	4.1264E-02	4.1275E-02	4.597E-02
CD-109	#A	9.9007E-02	9.9783E-02	1.2071E+00	1.2071E+00	1.336E+00
SN-113	#B	-1.5197E-02	-1.5671E-02	4.7897E-02	4.7906E-02	4.346E-02
SB-125	#B	-9.2217E-03	-9.2541E-03	1.5778E-01	1.5778E-01	1.038E-01
I-131	#B	2.8448E-03	4.4182E-03	3.9726E-02	3.9726E-02	2.933E-02
CS-134	#B	1.6652E-02	1.6731E-02	1.8538E-02	1.8564E-02	7.107E-02
CS-137	#	9.8177E-02	9.8209E-02	5.7304E-02	5.7596E-02	
CE-139	#A	1.8995E-03	1.9490E-03	3.4113E-02	3.4113E-02	3.741E-02
EU-152	#B	1.8048E-02	1.8062E-02	9.8171E-02	9.8177E-02	1.095E-01
EU-154	#B	6.8128E-03	6.8206E-03	6.9094E-02	6.9095E-02	7.741E-02
EU-155	#A	1.0792E-01	1.0813E-01	1.3335E-01	1.3349E-01	1.448E-01
HG-203	#B	2.4710E-03	2.6661E-03	3.1182E-02	3.1182E-02	3.286E-02
TL-208		2.3005E-01	2.3005E-01	4.9000E-02	5.0848E-02	
PB-212	#	7.1558E-01	7.1558E-01	1.0580E-01	1.1393E-01	8.922E-02
PB-214	#	4.1638E-01	4.1638E-01	8.6143E-02	8.9584E-02	7.416E-02
BI-212		6.3741E-01	6.3741E-01	3.6320E-01	3.6514E-01	
BI-214		3.5907E-01	3.5907E-01	1.1383E-01	1.1579E-01	
RA-224	#A	6.9643E-01	6.9643E-01	9.8523E-01	9.8609E-01	1.076E+00
RA-226	#	1.5799E+00	1.5799E+00	1.0064E+00	1.0107E+00	
AC-228		7.9306E-01	7.9306E-01	1.9065E-01	1.9632E-01	
TH-227	#B	-2.8499E-01	-2.8499E-01	3.6552E-01	3.6591E-01	3.955E-01
PA-234	#B	1.8311E-02	1.8311E-02	1.2739E-01	1.2740E-01	1.424E-01
TH-234	#B	9.2212E-01	9.2212E-01	7.3763E-01	7.3940E-01	1.749E+00
AM-241	#A	-1.9468E-02	-1.9468E-02	2.3708E-01	2.3709E-01	2.345E-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) 1.8640911E+01 pCi/gm
Total Decayed Activity (270.2 to 2000.1 keV) 1.8640951E+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_14AUG2006_1710.An1

Sample description
FSS-OOL-10-02-022-F-I

Spectrum Filename: C:\GammaVision\Spectra\107F_14AUG2006_1710.An1

Acquisition information

Start time:	14-Aug-2006 17:10:42
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:	1.4980E+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%
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-Aug-2006 16:10:00
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. 19 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.0705

***** 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	286.	13.46	1.18	2.849E-02	72.87	6.400	1.584E+00	HG203
					74.81	9.600	9.442E-01	PB212
77.05	400.	8.43	1.18	2.957E-02	77.11	10.700	1.460E+00	PB214
					77.11	17.500	9.008E-01	PB212
84.34	77.	40.92	1.18	3.224E-02				
87.12	178.	18.90	1.19	3.303E-02	86.45	32.740	1.500E-01	EU155
89.62	130.	26.24	1.19	3.367E-02	88.04	3.790	PBC<MDA	CD109
93.08	183.	18.78	1.19	3.445E-02	92.38	2.570	1.787E+00	TH234
					92.80	3.000	1.424E+00	TH234
185.82	155.	27.88	1.28	3.611E-02	185.99	3.280	1.182E+00	RA226
209.58	115.	37.20	1.17	3.426E-02				
238.65	1079.	3.77	1.30	3.189E-02	238.63	43.100	6.976E-01	PB212
					241.00	3.900	7.854E+00	RA224
241.33	166.	22.17	1.30	3.167E-02	241.92	7.470	6.296E-01	PB214
270.58	128.	26.69	1.32	2.942E-02				
277.61	67.	38.36	1.16	2.891E-02				
295.15	334.	13.50	1.34	2.768E-02	295.22	19.200	5.593E-01	PB214
338.43	245.	12.66	1.75	2.500E-02	338.40	12.010	7.263E-01	AC228
351.99	512.	7.67	1.57	2.426E-02	351.99	37.100	5.077E-01	PB214
410.00	32.	41.03	1.30	2.152E-02				
463.35	112.	22.12	1.13	1.953E-02				
463.35	112.	22.12	1.13	1.953E-02	463.51	10.000	5.052E-01	SB125
510.81	171.	14.44	2.02	1.808E-02	510.72	22.500	3.037E-01	TL208
583.17	377.	7.16	1.41	1.629E-02	583.14	86.000	2.401E-01	TL208
609.18	390.	7.24	1.81	1.574E-02	609.32	46.090	4.800E-01	BI214
727.17	93.	20.23	1.62	1.374E-02	727.17	11.800	5.085E-01	BI212
795.16	76.	27.74	1.64	1.285E-02				

795.16	76.	27.74	1.64	1.285E-02	795.76	85.400	6.247E-02	CS134
860.69	52.	25.22	1.17	1.211E-02				
911.07	268.	7.62	1.65	1.161E-02	911.07	29.000	7.079E-01	AC228
968.80	226.	11.43	1.46	1.109E-02	968.90	17.460	1.044E+00	AC228
1119.90	115.	15.53	1.63	9.972E-03	1120.28	15.040	6.865E-01	BI214
1460.56	1492.	2.65	2.07	8.192E-03	1460.75	10.700	1.531E+01	K40
1764.24	82.	11.04	1.31	7.084E-03	1764.51	15.920	6.488E-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	
168.34	84.38	457.	77.	0.038	122.89	1.185	TA-182	D
173.91	87.17	477.	181.	0.090	55.89	1.187	BI-207	D
178.91	89.67	516.	134.	0.067	76.47	1.189	PB-214	D
185.83	93.12	494.	185.	0.093	55.46	1.191	U-235	D
418.79	209.58	595.	115.	0.058	111.61	1.168	NP-239	s
540.78	270.58	357.	128.	0.064	80.08	1.316	AC-228	s
819.60	410.00	76.	32.	0.016	123.10	1.296	AC-228	
1720.95	860.69	48.	52.	0.026	75.66	1.168	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	622.	286.	0.143	40.39	1.178D
PB-212	153.89	77.11	637.	400.	0.200	25.30	1.179A
TH-234	185.74	93.04	1201.	152.	0.076	94.45	1.500s
TH-234	185.71	93.02	1176.	139.	0.070	93.90	1.500s
RA-226	371.27	185.82	636.	155.	0.078	83.63	1.275s
PB-212	476.89	238.63	304.	1063.	0.532	11.31	1.297D
RA-224	476.96	238.66	529.	995.	0.497	13.62	1.500s
PB-214	483.47	241.92	338.	164.	0.082	52.62	1.299D
PB-214	589.92	295.15	464.	329.	0.165	40.49	1.341
AC-228	676.47	338.43	250.	242.	0.121	37.97	1.746s
PB-214	703.59	351.99	308.	506.	0.253	23.01	1.567s
SB-125	925.19	462.79	140.	67.	0.033	80.20	1.500s
TL-208	1021.21	510.81	170.	137.	0.068	43.33	2.025s
TL-208	1165.91	583.17	126.	373.	0.186	21.48	1.413
BI-214	1217.93	609.18	132.	386.	0.193	21.72	1.808
BI-212	1453.91	727.17	91.	91.	0.046	60.69	1.617
CS-134	1589.50	794.97	77.	41.	0.020	101.80	1.684s
AC-228	1821.71	911.07	62.	264.	0.132	22.86	1.651
AC-228	1937.16	968.80	108.	224.	0.112	34.30	1.461s
BI-214	2239.36	1119.90	61.	114.	0.057	46.59	1.630s
K-40	2920.71	1460.56	20.	1487.	0.744	7.95	2.067
BI-214	3528.14	1764.24	1.	81.	0.041	33.13	1.312s

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		-1.2176E-02					
			477.56	-1.218E-02	%(	2.840E-01 8.25E-02	G
K-40		1.5310E+01					
			1460.75	1.531E+01	(P	2.399E-01 4.07E-01	G
MN-54		8.5025E-03					
			834.81	8.502E-03	%(P	2.992E-02 8.82E-03	G
CO-57		5.2637E-03					
			122.07	5.264E-03	%(P	3.896E-02 1.17E-02	G K
			136.43	-4.335E-02	& P	3.137E-01 9.39E-02	G
CO-60		-3.8322E-03					
			1332.51	-3.832E-03	%(P	3.384E-02 8.99E-03	G K
			1173.23	5.642E-03	% P	4.406E-02 1.27E-02	G K
Sr-85		-1.8855E-02					
			514.00	-1.885E-02	&(	3.939E-02 1.19E-02	G
Kr-85		-4.4758E+02					
			513.99	-4.476E+02	&(P	8.670E+02 2.61E+02	G
Y-88		-9.4466E-04					
			1836.01	-9.447E-04	%(P	2.962E-02 7.68E-03	G K
			898.02	-1.972E-03	% P	3.657E-02 1.03E-02	G
NB-94		-6.4157E-03					
			871.10	-6.416E-03	&(P	3.368E-02 9.84E-03	G K
			702.50	4.614E-04	& P	3.398E-02 9.79E-03	G K
Ag-108M		0.0000E+00					
			722.95	0.000E+00	&(	6.918E-02 2.04E-02	G K
			614.37	-2.098E-02	%	3.741E-02 1.14E-02	G
			433.93	-8.361E-04	% P	2.979E-02 8.59E-03	G
CD-109		2.0494E-01					
			88.04	2.049E-01	%(P	1.244E+00 3.74E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SN-113	3.2126E-03						
		391.71	3.213E-03	%(P	3.916E-02	1.14E-02	G K
		255.04	-1.563E-02	&	1.344E+00	3.96E-01	G
SB-125	8.8673E-02						
		427.95	1.447E-02	%(P	9.067E-02	2.67E-02	G K
		600.77	-9.311E-03	% P	1.541E-01	4.41E-02	G
		636.15	5.614E-02	% P	2.390E-01	7.02E-02	G
		463.51	3.083E-01	@(P	2.681E-01	8.59E-02	G
		176.29	-4.192E-02	% P	4.930E-01	1.47E-01	G
I-131	2.3491E-05						
		364.48	2.349E-05	&(	3.815E-02	1.10E-02	G K
		636.97	-1.870E-01	%	6.350E-01	1.89E-01	G
		284.29	8.611E-03	&	7.421E-01	2.19E-01	G
CS-134	1.6179E-02						
		604.66	9.866E-04	%(P	7.911E-02	2.35E-02	G K
		795.76	3.354E-02	@(P	3.610E-02	1.15E-02	G
		569.29	2.577E-02	%	1.855E-01	5.42E-02	G
		801.84	7.570E-03	% P	4.419E-01	1.28E-01	G
CS-137	1.5147E-03						
		661.62	1.515E-03	%(P	3.100E-02	8.77E-03	G
CE-139	-6.6457E-03						
		165.85	-6.646E-03	&(P	4.019E-02	1.20E-02	G
EU-152	7.3180E-03						
		121.78	7.318E-03	%(P	1.161E-01	3.47E-02	G K
		344.30	-1.610E-02	% P	1.049E-01	3.10E-02	G
		1408.08	4.446E-02	% P	1.437E-01	4.20E-02	G
		964.00	-1.254E-01	% P	3.866E-01	1.16E-01	G
		1112.07	8.362E-02	% P	1.719E-01	5.21E-02	G
		778.90	-1.543E-02	% P	2.295E-01	6.56E-02	G
EU-154	7.5981E-03						
		123.10	7.598E-03	%(P	7.366E-02	2.20E-02	G K
		1274.80	2.274E-02	% P	1.131E-01	3.30E-02	G
		723.30	-7.146E-02	& P	2.065E-01	6.18E-02	G
		1004.80	9.458E-02	% P	1.782E-01	5.44E-02	G
EU-155	1.0238E-01						
		86.45	1.024E-01	&(	1.401E-01	4.28E-02	G K
		105.31	6.651E-02	% P	1.568E-01	4.75E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
HG-203	-9.6404E-04						
		279.17	-9.640E-04	&(P	3.807E-02	1.12E-02	G K
		72.87	4.021E-02	% P	1.034E+00	3.09E-01	G
		70.83	-1.265E+00	&	1.925E+00	5.87E-01	G
		82.50	-5.128E-01	&	2.137E+00	6.43E-01	G
TL-208	2.4010E-01						
		583.14	2.401E-01	(P	3.545E-02	1.74E-02	G
		510.72	3.037E-01	+ P	1.408E-01	5.46E-02	G
PB-212	6.9784E-01						
		238.63	6.978E-01	(P	5.506E-02	2.67E-02	G K
							Energy duplication
		77.11	6.978E-01	}	2.098E-01	5.88E-02	G
		74.81	9.442E-01	+ P	3.921E-01	1.29E-01	G
PB-214	5.3697E-01						
		351.99	5.077E-01	*(P	8.463E-02	3.93E-02	G K
		295.22	5.593E-01	(P	1.749E-01	7.65E-02	G
							Energy duplication
		77.11	2.994E-01	} P	4.437E-01	1.34E-01	G
		241.92	6.249E-01	(P	3.376E-01	1.11E-01	G
BI-212	5.0852E-01						
		727.17	5.085E-01	(P	2.618E-01	1.04E-01	G K
		1620.56	4.199E-01	% P	8.617E-01	2.61E-01	G
		785.42	8.510E-01	% P	1.482E+00	4.53E-01	G
BI-214	4.8002E-01						
		609.32	4.800E-01	(P	6.992E-02	3.51E-02	G K
		1764.51	6.488E-01	+ P	5.896E-02	7.24E-02	G
		1120.28	6.865E-01	+ P	2.351E-01	1.07E-01	G
RA-224	7.2584E+00						
		241.00	7.258E+00	?(P	8.016E-01	3.30E-01	G
RA-226	1.1824E+00						
		185.99	1.182E+00	*(	9.158E-01	3.29E-01	G
AC-228	7.1331E-01						
		911.07	7.079E-01	(P	1.055E-01	5.48E-02	G K
		968.90	1.044E+00	+ P	2.380E-01	1.21E-01	G
		338.40	7.263E-01	(P	2.296E-01	9.31E-02	G
TH-227	-2.3291E-02						
		236.00	-2.329E-02	%(P	3.190E-01	9.50E-02	G K
		256.25	1.542E-01	& P	3.803E-01	1.15E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
PA-234	0.0000E+00						
		98.44	0.000E+00	%(	1.434E-01	4.27E-02	G K
		946.00	4.177E-02	&	1.682E-01	4.95E-02	G
		131.28	-4.084E-02	%	1.753E-01	5.27E-02	G
		94.67	-5.346E-03	%	2.800E-01	8.36E-02	G
		883.24	3.935E-02	&	2.551E-01	7.39E-02	G
		926.70	-4.233E-02	%	3.026E-01	8.77E-02	G
		569.26	3.807E-02	%	2.739E-01	8.01E-02	G
TH-234	1.0958E+00						
		63.29	6.979E-01	%(P	1.751E+00	5.28E-01	G K
		92.80	1.216E+00	(P	1.421E+00	4.35E-01	G
		92.38	1.559E+00	(P	1.681E+00	5.16E-01	G
AM-241	7.4730E-03						
		59.54	7.473E-03	&(P	2.312E-01	6.90E-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.
% - 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	-1.1405E-02	-1.2176E-02	2.4759E-01	2.4759E-01	2.660E-01
K-40		1.5310E+01	1.5310E+01	1.2203E+00	1.5188E+00	
MN-54	#A	8.4078E-03	8.5025E-03	2.6468E-02	2.6473E-02	2.959E-02
CO-57	#B	5.1960E-03	5.2637E-03	3.4963E-02	3.4964E-02	3.846E-02
CO-60	#B	-3.8252E-03	-3.8322E-03	4.7007E+00	4.7007E+00	3.377E-02
Sr-85	#A	-1.7865E-02	-1.8855E-02	3.5831E-02	3.5848E-02	3.732E-02
Kr-85	#A	-4.4756E+02	-4.4758E+02	9.1640E+02	9.1678E+02	8.669E+02
Y-88	#B	-9.1419E-04	-9.4466E-04	2.8376E-01	2.8376E-01	2.866E-02
NB-94	#B	-6.4157E-03	-6.4157E-03	3.0469E-02	3.0472E-02	3.368E-02
Ag-108M	#B	0.0000E+00	0.0000E+00	6.1204E-02	6.1204E-02	6.918E-02
CD-109	#A	2.0337E-01	2.0494E-01	1.1207E+00	1.1208E+00	1.234E+00
SN-113	#B	3.1165E-03	3.2126E-03	3.4228E-02	3.4229E-02	3.799E-02
SB-125	#B	8.8367E-02	8.8673E-02	7.4126E-02	7.4311E-02	9.036E-02
I-131	#B	1.5210E-05	2.3491E-05	3.2948E-02	3.2948E-02	2.470E-02
CS-134	#B	1.6104E-02	1.6179E-02	1.6685E-02	1.6713E-02	7.875E-02
CS-137	#A	1.5142E-03	1.5147E-03	2.6315E-02	2.6316E-02	3.099E-02
CE-139	#A	-6.4789E-03	-6.6457E-03	3.7240E-02	3.7243E-02	3.919E-02
EU-152	#B	7.3125E-03	7.3180E-03	1.0397E-01	1.0397E-01	1.160E-01
EU-154	#B	7.5896E-03	7.5981E-03	6.5903E-02	6.5904E-02	7.357E-02
EU-155	#B	1.0218E-01	1.0238E-01	1.2854E-01	1.2867E-01	1.398E-01
HG-203	#B	-8.9437E-04	-9.6404E-04	1.1797E-01	1.1797E-01	3.532E-02
TL-208		2.4010E-01	2.4010E-01	5.2195E-02	5.4087E-02	
PB-212		6.9784E-01	6.9784E-01	8.0087E-02	9.0070E-02	
PB-214		5.3697E-01	5.3697E-01	1.2480E-01	1.2877E-01	
BI-212		5.0852E-01	5.0852E-01	3.1296E-01	3.1440E-01	
BI-214		4.8002E-01	4.8002E-01	1.0542E-01	1.0916E-01	
RA-224	#	7.2584E+00	7.2584E+00	9.9103E-01	1.0798E+00	8.016E-01
RA-226	#	1.1824E+00	1.1824E+00	9.8882E-01	9.9128E-01	
AC-228		7.1331E-01	7.1331E-01	1.6027E-01	1.6571E-01	
TH-227	#B	-2.3291E-02	-2.3291E-02	3.0235E-01	3.0236E-01	3.190E-01
PA-234	#B	0.0000E+00	0.0000E+00	1.2801E-01	1.2801E-01	1.434E-01
TH-234	#B	1.0958E+00	1.0958E+00	9.8570E-01	9.8757E-01	1.751E+00
AM-241	#A	7.4728E-03	7.4730E-03	2.0691E-01	2.0691E-01	2.312E-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) 1.9669495E+01 pCi/gm
Total Decayed Activity (270.2 to 2000.1 keV) 1.9669500E+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_10JUN2006_1438.An1

Sample description
OOL-10-03-001-C

Spectrum Filename: C:\GammaVision\Spectra\101_10JUN2006_1438.An1

Acquisition information
Start time: 10-Jun-2006 14:38:41
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: 1.6710E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.6710E+03) =
5.9844E+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	10-Jun-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. 12 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.1217

***** 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	162.	26.16	1.50	1.654E-02	72.87	6.400	1.285E+00	HG203
					74.81	9.600	8.227E-01	PB212
77.12	239.	17.65	1.50	1.720E-02	77.11	10.700	1.051E+00	PB214
					77.11	17.500	6.424E-01	PB212
77.12	243.	17.65	1.50	1.720E-02	77.11	10.700	1.051E+00	PB214
					77.11	17.500	6.524E-01	PB212
92.89	100.	37.15	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
92.93	91.	39.49	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
238.69	602.	4.84	1.12	1.558E-02				
238.69	602.	4.84	1.12	1.558E-02	238.63	43.100	7.175E-01	PB212
241.99	95.	19.36	1.12	1.540E-02	241.00	3.900	PBC<MDA	RA224
270.24	58.	29.26	0.80	1.400E-02				
295.35	114.	13.90	1.16	1.292E-02	295.22	19.200	3.644E-01	PB214
299.91	40.	34.71	1.16	1.273E-02				
337.96	157.	14.97	1.22	1.136E-02	338.40	12.010	9.197E-01	AC228
351.81	190.	10.40	1.35	1.093E-02				
351.81	190.	10.40	1.35	1.093E-02	351.99	37.100	3.750E-01	PB214
463.16	58.	30.75	0.69	8.348E-03				
463.16	58.	30.75	0.69	8.348E-03	463.51	10.000	5.464E-01	SB125
510.36	75.	19.18	1.30	7.596E-03	510.72	22.500	2.793E-01	TL208
583.11	222.	10.02	1.38	6.685E-03	583.14	86.000	3.084E-01	TL208
609.19	144.	13.09	1.31	6.414E-03	609.32	46.090	3.910E-01	BI214
727.15	60.	32.04	1.30	5.443E-03	727.17	11.800	7.419E-01	BI212

794.62	37.	27.61	1.54	5.023E-03				
794.62	37.	27.61	1.54	5.023E-03	795.76	85.400	6.831E-02	CS134
910.89	131.	14.98	1.25	4.447E-03	911.07	29.000	8.099E-01	AC228
964.13	22.	35.23	1.61	4.230E-03	964.00	14.580	PBC<MDA	EU152
968.70	63.	16.49	1.62	4.212E-03	968.90	17.460	6.827E-01	AC228

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
1120.53	50.	27.38	2.03	3.711E-03	1120.28	15.040	7.175E-01	BI214
1460.32	542.	4.39	1.91	2.943E-03	1460.75	10.700	1.386E+01	K40
1763.99	31.	17.96	1.75	2.481E-03	1764.51	15.920	6.257E-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	
477.08	238.61	123.	602.	0.301	14.52	1.122	PB-212	D
483.68	241.91	120.	95.	0.047	58.08	1.124	PB-214	D
540.20	270.24	115.	58.	0.029	87.78	0.796	AC-228	
599.58	299.84	79.	40.	0.020	104.14	1.165	TH-227	lD
1589.46	794.62	22.	38.	0.019	72.27	1.544	AC-228	
1928.72	964.37	19.	22.	0.011	104.83	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	149.10	74.77	874.	162.	0.081	78.49	1.499
PB-214	153.79	77.11	801.	239.	0.120	52.94	1.499D
PB-212	153.79	77.11	797.	243.	0.121	52.94	1.499D
TH-234	185.37	92.89	738.	100.	0.050	111.45	1.499s
PB-212	477.09	238.70	336.	521.	0.261	19.61	1.499
PB-214	590.45	295.35	167.	94.	0.047	64.60	1.499
AC-228	675.70	337.96	139.	155.	0.078	44.92	1.217s
PB-214	703.51	351.86	93.	189.	0.095	30.32	1.499
SB-125	925.93	463.02	47.	36.	0.018	90.50	1.499s
TL-208	1020.67	510.36	76.	59.	0.029	57.55	1.297s
TL-208	1166.23	583.11	78.	219.	0.110	30.06	1.379
BI-214	1218.41	609.19	67.	143.	0.071	39.26	1.314
BI-212	1454.45	727.15	75.	59.	0.029	96.12	1.302
AC-228	1822.14	910.89	64.	129.	0.065	44.95	1.252s
AC-228	1938.21	968.90	23.	62.	0.031	49.44	1.616D
BI-214	2241.65	1120.53	44.	50.	0.025	82.13	2.034s
K-40	2921.65	1460.32	9.	540.	0.270	13.18	1.910
BI-214	3529.41	1763.99	0.	31.	0.015	53.88	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	Peak Code	Peak MDA Value pCi/gm	COMMENTS
BE-7		-8.9772E-03					
			477.56	-8.977E-03	%(	4.049E-01 1.15E-01	G
K-40		1.3858E+01					
			1460.75	1.386E+01	(P	4.382E-01 6.11E-01	G
MN-54		1.5429E-02					
			834.81	1.543E-02	%(P	5.514E-02 1.61E-02	G
CO-57		1.2699E-03					
			122.07	1.270E-03	&(	4.848E-02 1.44E-02	G K
			136.43	2.063E-02	&	4.129E-01 1.23E-01	G
CO-60		8.3835E-03					
			1332.51	8.383E-03	%(P	5.208E-02 1.45E-02	G K
			1173.23	1.844E-02	% P	8.304E-02 2.42E-02	G K
Sr-85		-3.2075E-02					
			514.00	-3.208E-02	%(	6.486E-02 1.97E-02	G
Kr-85		-7.7028E+02					
			513.99	-7.703E+02	%(P	1.502E+03 4.54E+02	G
Y-88		-7.1795E-03					
			1836.01	-7.179E-03	%(	5.102E-02 1.36E-02	G K
			898.02	-3.217E-03	% P	6.014E-02 1.68E-02	G
NB-94		1.1831E-02					
			871.10	1.183E-02	&(P	4.436E-02 1.28E-02	G K
			702.50	1.820E-02	% P	5.201E-02 1.55E-02	G K
Ag-108M		-2.2663E-02					
			722.95	-2.266E-02	%(	7.471E-02 2.22E-02	G K
			614.37	-1.091E-02	% P	5.595E-02 1.63E-02	G
			433.93	1.034E-02	&	4.203E-02 1.24E-02	G
CD-109		-1.5800E-01					
			88.04	-1.580E-01	%(P	1.628E+00 4.87E-01	G
SN-113		-1.2231E-02					
			391.71	-1.223E-02	%(	6.041E-02 1.77E-02	G K
			255.04	3.946E-01	% P	1.611E+00 4.78E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	8.7831E-02						
		427.95	-9.727E-04	%(P	1.212E-01	3.42E-02	G K
		600.77	1.689E-02	% P	2.575E-01	7.33E-02	G
		636.15	-3.332E-03	% P	4.745E-01	1.34E-01	G
		463.51	3.507E-01	(P	3.361E-01	1.10E-01	G
		176.29	9.341E-02	% P	6.143E-01	1.82E-01	G
I-131	-1.0854E-02						
		364.48	-1.085E-02	%(	4.989E-02	1.47E-02	G K
		636.97	0.000E+00	%	6.781E-01	1.91E-01	G
		284.29	1.098E-01	&	6.377E-01	1.88E-01	G
CS-134	5.7236E-04						
		604.66	5.724E-04	%(P	1.085E-01	3.19E-02	G K
		795.76	-2.802E-03	% P	4.213E-02	1.13E-02	G
		569.29	5.979E-03	% P	2.932E-01	8.28E-02	G
		801.84	-1.359E-01	%	5.551E-01	1.61E-01	G
CS-137	-7.2335E-03						
		661.62	-7.233E-03	%(P	5.951E-02	1.69E-02	G
CE-139	-1.2450E-02						
		165.85	-1.245E-02	%(P	5.303E-02	1.59E-02	G
EU-152	4.1747E-02						
		121.78	4.175E-02	&(P	1.376E-01	4.13E-02	G K
		344.30	1.958E-02	& P	1.323E-01	3.86E-02	G
		1408.08	-9.706E-03	% P	2.615E-01	6.93E-02	G
		964.00	1.761E-01	% P	3.978E-01	1.20E-01	G
		1112.07	1.250E-02	& P	4.331E-01	1.19E-01	G
		778.90	3.220E-02	% P	3.273E-01	9.14E-02	G
EU-154	-2.1452E-02						
		123.10	-2.145E-02	%(P	1.023E-01	3.06E-02	G K
		1274.80	-1.320E-02	& P	2.113E-01	5.92E-02	G
		723.30	-1.124E-01	% P	3.623E-01	1.07E-01	G
		1004.80	-7.008E-04	% P	3.630E-01	1.01E-01	G
EU-155	3.4448E-02						
		86.45	3.445E-02	%(	1.483E-01	4.45E-02	G K
		105.31	1.176E-01	%	1.969E-01	6.01E-02	G
HG-203	2.7527E-02						
		279.17	2.753E-02	&(	4.441E-02	1.36E-02	G K
		72.87	-2.642E-04	% P	1.164E+00	3.46E-01	G
		70.83	3.238E-02	%	2.592E+00	7.75E-01	G
		82.50	-4.344E-01	%	2.599E+00	7.78E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	3.0236E-01						
		583.14	3.084E-01	(P	6.163E-02	3.12E-02	G
		510.72	2.793E-01	*(P	2.052E-01	6.81E-02	G
PB-212	6.3488E-01						
		238.63	6.277E-01	(P	1.062E-01	4.15E-02	G K
							Energy duplication
		77.11	6.524E-01	(	3.607E-01	1.15E-01	G
		74.81	8.227E-01	& P	7.154E-01	2.22E-01	G
PB-214	3.5328E-01						
		351.99	3.772E-01	(P	9.499E-02	3.85E-02	G K
		295.22	3.071E-01	(P	2.054E-01	6.74E-02	G
							Energy duplication
		77.11	1.051E+00	+ P	5.913E-01	1.88E-01	G
		241.92	1.146E-01	% P	6.485E-01	1.93E-01	G
BI-212	7.4192E-01						
		727.17	7.419E-01	(P	5.425E-01	2.40E-01	G K
		1620.56	0.000E+00	%	1.740E+00	4.38E-01	G
		785.42	8.670E-02	& P	2.884E+00	8.13E-01	G
BI-214	3.9098E-01						
		609.32	3.910E-01	(P	1.119E-01	5.16E-02	G K
		1764.51	6.257E-01	+ P	1.509E-01	1.14E-01	G
		1120.28	7.175E-01	+ P	4.896E-01	1.98E-01	G
RA-224	8.7012E-01						
		241.00	8.701E-01	&(P	1.321E+00	4.04E-01	G
RA-226	6.1918E-01						
		185.99	6.192E-01	%(	1.205E+00	3.66E-01	G
AC-228	7.9451E-01						
		911.07	8.099E-01	@(P	2.506E-01	1.23E-01	G K
		968.90	6.829E-01	(P	2.750E-01	1.14E-01	G
		338.40	9.197E-01	*(P	3.420E-01	1.40E-01	G
TH-227	-3.6598E-02						
		236.00	-3.660E-02	%(P	4.471E-01	1.32E-01	G K
		256.25	1.172E-01	% P	5.441E-01	1.61E-01	G
PA-234	-4.5364E-02						
		98.44	-4.536E-02	%(	1.893E-01	5.68E-02	G K
		946.00	4.838E-02	&	2.864E-01	8.20E-02	G
		131.28	1.574E-02	&	2.272E-01	6.76E-02	G
		94.67	-1.746E-02	&	3.308E-01	9.85E-02	G
		883.24	0.000E+00	%	5.435E-01	1.53E-01	G
		926.70	-7.085E-03	%	5.674E-01	1.59E-01	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26 3.682E-02 %   3.476E-01 9.83E-02 G

TH-234       9.6484E-01
                           63.29 6.598E-01 %(P 2.288E+00 6.86E-01 G K
                           92.80 1.361E+00  (P 1.752E+00 5.37E-01 G
                           92.38 1.448E+00 % P 2.099E+00 6.40E-01 G

AM-241      -4.9756E-02
                           59.54-4.976E-02 %(P 3.025E-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	-8.9692E-03	-8.9772E-03	3.4581E-01	3.4581E-01	4.045E-01
K-40		1.3858E+01	1.3858E+01	1.8337E+00	1.9939E+00	
MN-54	#A	1.5427E-02	1.5429E-02	4.8407E-02	4.8415E-02	5.513E-02
CO-57	#B	1.2697E-03	1.2699E-03	4.3098E-02	4.3098E-02	4.847E-02
CO-60	#B	8.3833E-03	8.3835E-03	4.3366E-02	4.3368E-02	5.208E-02

Sr-85	#A	-3.2052E-02	-3.2075E-02	5.9090E-02	5.9117E-02	6.482E-02
Kr-85	#A	-7.7028E+02	-7.7028E+02	1.4712E+03	1.4719E+03	1.502E+03
Y-88	#B	-7.1763E-03	-7.1795E-03	4.0837E-02	4.0839E-02	5.100E-02
NB-94	#B	1.1831E-02	1.1831E-02	3.8518E-02	3.8524E-02	4.436E-02
Ag-108M	#B	-2.2663E-02	-2.2663E-02	6.6542E-02	6.6555E-02	7.471E-02
CD-109	#A	-1.5798E-01	-1.5800E-01	1.5585E+00	1.5586E+00	1.628E+00
SN-113	#B	-1.2226E-02	-1.2231E-02	5.3186E-02	5.3190E-02	6.039E-02
SB-125	#B	8.7827E-02	8.7831E-02	8.2667E-02	8.2815E-02	1.212E-01
I-131	#B	-1.0790E-02	-1.0854E-02	4.4148E-02	4.4152E-02	4.960E-02
CS-134	#B	5.7232E-04	5.7236E-04	9.5629E-02	9.5629E-02	1.085E-01
CS-137	#A	-7.2335E-03	-7.2335E-03	7.5436E-02	7.5437E-02	5.951E-02
CE-139	#A	-1.2446E-02	-1.2450E-02	4.8902E-02	4.8907E-02	5.301E-02
EU-152	#B	4.1746E-02	4.1747E-02	1.2398E-01	1.2401E-01	1.376E-01
EU-154	#B	-2.1452E-02	-2.1452E-02	9.9414E-02	9.9421E-02	1.023E-01
EU-155	#B	3.4447E-02	3.4448E-02	1.3336E-01	1.3337E-01	1.483E-01
HG-203	#B	2.7499E-02	2.7527E-02	4.0903E-02	4.0933E-02	4.436E-02
TL-208		3.0236E-01	3.0236E-01	9.1874E-02	9.3449E-02	
PB-212	#	6.3488E-01	6.3488E-01	1.2595E-01	1.3096E-01	1.062E-01
PB-214	#	3.5328E-01	3.5328E-01	1.0824E-01	1.1006E-01	9.499E-02
BI-212		7.4192E-01	7.4192E-01	7.2132E-01	7.2254E-01	
BI-214		3.9098E-01	3.9098E-01	1.5470E-01	1.5627E-01	
RA-224	#A	8.7012E-01	8.7012E-01	1.2133E+00	1.2143E+00	1.321E+00
RA-226	#A	6.1918E-01	6.1918E-01	1.0989E+00	1.0995E+00	1.205E+00
AC-228		7.9451E-01	7.9451E-01	2.1604E-01	2.2066E-01	
TH-227	#B	-3.6598E-02	-3.6598E-02	4.4332E-01	4.4333E-01	4.471E-01
PA-234	#B	-4.5364E-02	-4.5364E-02	1.7035E-01	1.7037E-01	1.893E-01
TH-234	#B	9.6484E-01	9.6484E-01	1.1415E+00	1.1428E+00	2.288E+00
AM-241	#A	-4.9756E-02	-4.9756E-02	2.9731E-01	2.9732E-01	3.025E-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) 1.6087894E+01 pCi/gm
Total Decayed Activity (1120.2 to 1999.1 keV) 1.6087894E+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_6JULY2006_0815.An1

Sample description
FSS-OOL-10-03-014-F

Spectrum Filename: C:\GammaVision\Spectra\101F_6JULY2006_0815.An1

Acquisition information
Start time: 06-Jul-2006 08:15:41
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: 2.1560E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 2.1560E+03) =
4.6382E+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	26-Jun-2006 15:40:00
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. 19 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.2059

***** 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	235.	14.27	1.00	1.654E-02	74.81	9.600	9.075E-01	PB212
77.78	221.	16.89	1.01	1.738E-02	77.11	17.500	4.597E-01	PB212
					77.11	10.700	7.391E-01	PB214
84.21	92.	35.62	0.00	1.874E-02				
86.94	135.	22.77	1.01	1.919E-02	86.45	32.740	1.356E-01	EU155
90.01	132.	22.42	1.02	1.960E-02	88.04	3.790	PBC<MDA	CD109
93.35	162.	19.06	1.02	1.996E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	1.632E+00	TH234
					98.44	25.100	1.979E-01	PA234
185.68	149.	25.30	1.80	1.860E-02				
185.68	149.	25.30	1.80	1.860E-02	185.99	3.280	1.528E+00	RA226
209.45	116.	23.92	1.08	1.721E-02				
238.75	538.	7.06	1.50	1.540E-02	238.63	43.100	PBC<MDA	PB212
238.84	963.	3.81	1.12	1.557E-02	238.63	43.100	8.931E-01	PB212
241.65	138.	18.81	1.12	1.542E-02	241.00	3.900	1.432E+00	RA224
270.28	67.	28.83	1.20	1.400E-02				
295.07	158.	14.68	1.29	1.293E-02				
295.07	158.	14.68	1.29	1.293E-02	295.22	19.200	3.945E-01	PB214
300.38	69.	29.30	1.03	1.271E-02				
327.87	63.	39.82	1.48	1.170E-02				
338.72	227.	11.30	1.35	1.134E-02	338.40	12.010	1.035E+00	AC228
351.97	292.	8.45	0.99	1.093E-02				
351.97	292.	8.45	0.99	1.093E-02	351.99	37.100	4.493E-01	PB214
462.98	60.	30.29	0.93	8.351E-03				
462.98	60.	30.29	0.93	8.351E-03	463.51	10.000	4.429E-01	SB125
510.68	150.	17.06	1.40	7.591E-03	510.72	22.500	4.935E-01	TL208
583.24	284.	8.37	1.26	6.683E-03	583.14	86.000	3.067E-01	TL208

609.40	225.	9.33	1.38	6.412E-03	609.32	46.090	4.748E-01	BI214
719.28	25.	32.80	1.50	5.470E-03	723.30	19.700	1.449E-01	EU154
727.31	88.	20.77	1.21	5.442E-03	727.17	11.800	8.522E-01	BI212
785.91	23.	35.59	1.44	5.075E-03	785.42	2.000	PBC<MDA	BI212
795.07	62.	23.89	2.13	5.020E-03				
795.07	62.	23.89	2.13	5.020E-03	795.76	85.400	9.032E-02	CS134
861.00	48.	25.07	1.66	4.675E-03				
911.47	200.	8.52	1.37	4.445E-03	911.07	29.000	9.650E-01	AC228
969.38	127.	14.45	1.57	4.210E-03	968.90	17.460	1.076E+00	AC228
1120.45	79.	24.34	2.22	3.711E-03	1120.28	15.040	8.897E-01	BI214

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
1461.19	717.	3.84	1.81	2.942E-03	1460.75	10.700	1.422E+01	K40
1765.17	44.	15.08	1.75	2.481E-03	1764.51	15.920	6.912E-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	
149.20	74.82	446.	235.	0.118	42.82	1.005	PB-214	D
155.12	77.78	585.	221.	0.110	50.68	1.007	PB-214	D
173.46	87.08	403.	135.	0.067	68.31	1.014	PB-214	lD
179.60	90.15	375.	132.	0.066	67.26	1.016	PB-214	lD
418.58	209.45	310.	116.	0.058	71.76	1.078	AC-228	s
477.39	238.75	191.	962.	0.481	11.43	1.122	PB-212	D
540.28	270.28	153.	67.	0.034	86.48	1.203	AC-228	
600.51	300.38	152.	69.	0.034	84.51	1.026	PB-212	s
655.52	327.87	209.	63.	0.031	119.47	1.476	AC-228	s
925.85	462.98	104.	60.	0.030	90.88	0.933	AC-228	l
1722.29	861.00	34.	48.	0.024	75.20	1.661	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	149.19	74.81	1227.	215.	0.107	70.35	1.499D
PB-212	153.79	77.11	1141.	344.	0.172	44.74	1.499D
PB-214	153.79	77.11	1145.	340.	0.170	44.74	1.499D
TH-234	185.81	93.12	997.	182.	0.091	74.34	1.499s
RA-226	371.55	185.95	545.	105.	0.052	98.75	1.499s
PB-212	477.28	238.79	474.	727.	0.364	16.72	1.499
RA-224	481.70	241.00	612.	128.	0.064	85.61	1.123D
PB-214	477.19	238.75	454.	538.	0.269	21.18	1.499s
PB-214	590.29	295.27	224.	157.	0.079	46.33	1.499s
AC-228	677.23	338.72	162.	225.	0.113	33.89	1.347s
PB-214	703.97	352.08	123.	270.	0.135	24.98	1.499
TL-208	1021.31	510.68	147.	134.	0.067	51.19	1.400s
TL-208	1166.49	583.24	93.	281.	0.141	25.10	1.259
BI-214	1218.83	609.40	73.	224.	0.112	28.00	1.376s
EU-154	1438.71	719.28	22.	25.	0.012	98.39	1.499s
BI-212	1454.77	727.31	83.	87.	0.044	62.30	1.214s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
BI-212	1572.04	785.91	22.	23.	0.011	106.77	1.437
CS-134	1590.74	795.26	37.	49.	0.025	66.52	1.502s
AC-228	1823.29	911.47	29.	199.	0.099	25.56	1.371s
AC-228	1939.17	969.38	61.	126.	0.063	43.36	1.569
BI-214	2241.49	1120.45	71.	79.	0.040	73.01	2.220s
K-40	2923.41	1461.19	13.	715.	0.357	11.53	1.805
BI-214	3531.77	1765.17	0.	44.	0.022	45.23	1.749s

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	Peak MDA Value pCi/gm	COMMENTS
BE-7		-8.2572E-02					
			477.56	-8.257E-02	&(	3.361E-01 9.86E-02	G
K-40		1.4225E+01					
			1460.75	1.422E+01	(P	3.946E-01 5.49E-01	G
MN-54		8.0166E-03					
			834.81	8.017E-03	&(P	4.026E-02 1.16E-02	G
CO-57		-1.2201E-02					
			122.07	-1.220E-02	%(	5.044E-02 1.52E-02	G K
			136.43	1.151E-01	%	3.901E-01 1.17E-01	G
CO-60		-6.5166E-04					
			1332.51	-6.517E-04	%(P	4.420E-02 1.18E-02	G K
			1173.23	7.594E-03	% P	4.930E-02 1.40E-02	G K
Sr-85		-1.7840E-02					
			514.00	-1.784E-02	%(	6.009E-02 1.79E-02	G
Kr-85		-3.9427E+02					
			513.99	-3.943E+02	%(P	1.255E+03 3.73E+02	G
Y-88		7.3793E-03					
			1836.01	7.379E-03	%(	3.074E-02 8.37E-03	G K
			898.02	-6.334E-03	% P	4.875E-02 1.38E-02	G
NB-94		5.8279E-03					
			871.10	5.828E-03	&(P	4.303E-02 1.23E-02	G K
			702.50	-3.274E-03	& P	5.002E-02 1.44E-02	G K

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
Ag-108M	0.0000E+00						
		722.95	0.000E+00	%(	9.836E-02	2.88E-02	G K
		614.37	-1.900E-02	& P	4.984E-02	1.49E-02	G
		433.93	8.135E-04	%	4.183E-02	1.21E-02	G
CD-109	1.4770E-01						
		88.04	1.477E-01	%(P	1.446E+00	4.33E-01	G
SN-113	-7.1237E-03						
		391.71	-7.124E-03	%(	6.356E-02	1.86E-02	G K
		255.04	8.667E-02	& P	1.773E+00	5.22E-01	G
SB-125	-3.4183E-02						
		427.95	-3.418E-02	%(P	1.326E-01	3.93E-02	G K
		600.77	6.723E-02	% P	1.824E-01	5.43E-02	G
		636.15	-4.387E-02	% P	3.571E-01	1.02E-01	G
		463.51	2.473E-01	% P	3.850E-01	1.18E-01	G
		176.29	-1.221E-01	% P	6.115E-01	1.83E-01	G
I-131	9.5873E-03						
		364.48	9.587E-03	&(	9.948E-02	2.91E-02	G K
		636.97	-2.365E-02	&	1.294E+00	3.67E-01	G
		284.29	5.339E-02	%	1.282E+00	3.76E-01	G
CS-134	3.0421E-02						
		604.66	-6.852E-03	%(P	4.751E-02	1.38E-02	G K
		795.76	7.302E-02	(P	4.564E-02	1.63E-02	G
		569.29	3.715E-03	% P	3.184E-01	9.17E-02	G
		801.84	-2.531E-02	&	4.589E-01	1.29E-01	G
CS-137	1.0991E-02						
		661.62	1.099E-02	%(P	4.489E-02	1.31E-02	G
CE-139	1.1748E-02						
		165.85	1.175E-02	%(P	5.035E-02	1.51E-02	G
EU-152	-3.1352E-02						
		121.78	-3.135E-02	%(P	1.469E-01	4.41E-02	G K
		344.30	-1.971E-02	& P	1.435E-01	4.22E-02	G
		1408.08	1.014E-01	% P	2.179E-01	6.59E-02	G
		964.00	1.647E-01	% P	4.046E-01	1.21E-01	G
		1112.07	1.366E-02	% P	5.440E-01	1.55E-01	G
		778.90	8.284E-02	& P	2.756E-01	8.08E-02	G
EU-154	5.2780E-02						
		123.10	7.922E-03	%(P	8.935E-02	2.66E-02	G K
		1274.80	3.793E-02	% P	1.239E-01	3.61E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
		723.30	1.449E-01	?(P	1.431E-01	4.82E-02	G
		1004.80	3.975E-03	& P	2.817E-01	7.85E-02	G
EU-155	9.0738E-02						
		86.45	9.074E-02	%(	1.657E-01	5.04E-02	G K
		105.31	8.452E-03	%	1.988E-01	5.93E-02	G
HG-203	-2.4379E-03						
		279.17	-2.438E-03	&(	5.503E-02	1.62E-02	G K
		72.87	-2.727E-01	% P	1.124E+00	3.37E-01	G
		70.83	-8.348E-01	&	2.291E+00	6.92E-01	G
		82.50	-1.302E+00	%	2.666E+00	8.09E-01	G
TL-208	3.0673E-01						
		583.14	3.067E-01	(P	5.187E-02	2.59E-02	G
		510.72	4.935E-01	+ P	2.170E-01	9.43E-02	G
PB-212	6.8951E-01						
		238.63	6.790E-01	(P	9.730E-02	3.82E-02	G K
							Energy duplication
		77.11	7.154E-01	(	3.333E-01	1.07E-01	G
							Energy duplication
		74.81	8.481E-01	+ P	6.551E-01	2.04E-01	G
PB-214	4.1118E-01						
		351.99	4.181E-01	(P	8.413E-02	3.51E-02	G K
		295.22	3.977E-01	*(P	1.832E-01	6.21E-02	G
							Energy duplication
		77.11	1.157E+00	+ P	5.461E-01	1.74E-01	G
		241.92	2.931E+00	+ P	5.558E-01	2.07E-01	G
BI-212	9.3235E-01						
		727.17	8.522E-01	@(P	4.400E-01	1.78E-01	G K
		1620.56	0.000E+00	%	1.815E+00	4.81E-01	G
		785.42	1.405E+00	(P	1.524E+00	5.06E-01	G
BI-214	4.7480E-01						
		609.32	4.748E-01	@(P	9.024E-02	4.45E-02	G K
		1764.51	6.912E-01	+ P	1.169E-01	1.05E-01	G
		1120.28	8.897E-01	+ P	4.707E-01	2.18E-01	G
RA-224	1.3325E+00						
		241.00	1.333E+00	(P	1.227E+00	3.82E-01	G
RA-226	1.0797E+00						
		185.99	1.080E+00	*(	1.146E+00	3.55E-01	G
AC-228	1.0125E+00						
		911.07	9.650E-01	@(P	1.361E-01	8.30E-02	G K
		968.90	1.076E+00	(P	3.326E-01	1.57E-01	G
		338.40	1.035E+00	*(P	2.852E-01	1.18E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TH-227	-1.1481E-01						
		236.00	-1.148E-01	&(P	4.029E-01	1.21E-01	G K
		256.25	-8.551E-02	% P	5.037E-01	1.49E-01	G
PA-234	-3.4907E-04						
		98.44	-3.491E-04	&(	1.381E-01	4.09E-02	G K
		946.00	8.324E-02	%	2.245E-01	6.68E-02	G
		131.28	1.896E-02	&	2.128E-01	6.36E-02	G
		94.67	-1.377E-01	%	3.248E-01	9.83E-02	G
		883.24	0.000E+00	&	3.096E-01	8.46E-02	G
		926.70	0.000E+00	%	4.497E-01	1.26E-01	G
		569.26	9.380E-03	%	4.673E-01	1.35E-01	G
TH-234	8.4881E-01						
		63.29	3.317E-02	%(P	2.055E+00	6.11E-01	G K
		92.80	1.909E+00	(P	1.574E+00	4.89E-01	G
		92.38	4.972E-02	& P	1.890E+00	5.63E-01	G
AM-241	2.6653E-02						
		59.54	2.665E-02	%(P	2.711E-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

- -

***** 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	-7.2811E-02	-8.2572E-02	2.9590E-01	2.9594E-01	2.964E-01
K-40		1.4225E+01	1.4225E+01	1.6458E+00	1.8315E+00	
MN-54	#A	7.8459E-03	8.0166E-03	3.4682E-02	3.4685E-02	3.940E-02
CO-57	#B	-1.1901E-02	-1.2201E-02	4.5481E-02	4.5486E-02	4.920E-02
CO-60	#B	-6.4939E-04	-6.5166E-04	6.0593E-02	6.0593E-02	4.405E-02
Sr-85	#A	-1.6084E-02	-1.7840E-02	5.3818E-02	5.3828E-02	5.417E-02
Kr-85	#A	-3.9424E+02	-3.9427E+02	1.2574E+03	1.2576E+03	1.255E+03
Y-88	#B	6.9286E-03	7.3793E-03	2.5098E-02	2.5101E-02	2.886E-02
NB-94	#B	5.8279E-03	5.8279E-03	3.6780E-02	3.6781E-02	4.303E-02
Ag-108M	#B	0.0000E+00	0.0000E+00	8.6424E-02	8.6424E-02	9.834E-02
CD-109	#A	1.4553E-01	1.4770E-01	1.2992E+00	1.2993E+00	1.425E+00
SN-113	#B	-6.7198E-03	-7.1237E-03	5.5880E-02	5.5881E-02	5.996E-02
SB-125	#B	-3.3957E-02	-3.4183E-02	1.2328E-01	1.2330E-01	1.318E-01
I-131	#B	4.1575E-03	9.5873E-03	8.7251E-02	8.7253E-02	4.314E-02
CS-134	#B	3.0151E-02	3.0421E-02	2.0406E-02	2.0479E-02	4.709E-02
CS-137	#A	1.0984E-02	1.0991E-02	3.9230E-02	3.9235E-02	4.486E-02
CE-139	#A	1.1187E-02	1.1748E-02	4.5291E-02	4.5295E-02	4.794E-02
EU-152	#B	-3.1307E-02	-3.1352E-02	1.3917E-01	1.3918E-01	1.467E-01
EU-154	#B	5.2666E-02	5.2780E-02	5.2689E-02	5.2770E-02	8.916E-02
EU-155	#B	9.0402E-02	9.0738E-02	1.5109E-01	1.5117E-01	1.650E-01
HG-203	#B	-2.1106E-03	-2.4379E-03	4.8636E-02	4.8636E-02	4.764E-02
TL-208		3.0673E-01	3.0673E-01	7.7656E-02	7.9566E-02	
PB-212	#	6.8951E-01	6.8951E-01	1.1624E-01	1.2259E-01	9.730E-02
PB-214	#	4.1118E-01	4.1118E-01	1.0348E-01	1.0606E-01	8.413E-02
BI-212		9.3235E-01	9.3235E-01	5.8193E-01	5.8431E-01	
BI-214		4.7480E-01	4.7480E-01	1.3360E-01	1.3627E-01	
RA-224		1.3325E+00	1.3325E+00	1.1472E+00	1.1497E+00	
RA-226	#A	1.0797E+00	1.0797E+00	1.0662E+00	1.0680E+00	1.146E+00
AC-228		1.0125E+00	1.0125E+00	2.0636E-01	2.1414E-01	
TH-227	#B	-1.1481E-01	-1.1481E-01	3.7284E-01	3.7289E-01	4.029E-01
PA-234	#B	-3.4907E-04	-3.4907E-04	1.2276E-01	1.2276E-01	1.381E-01
TH-234	#B	8.4881E-01	8.4881E-01	6.5242E-01	6.5411E-01	2.055E+00
AM-241	#A	2.6652E-02	2.6653E-02	2.4273E-01	2.4273E-01	2.710E-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 (252.1 to 1999.1 keV) 1.8283524E+01 pCi/gm
Total Decayed Activity (252.1 to 1999.1 keV) 1.8283524E+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_26JUN2006_1648.An1

Sample description
FSS-OOL-10-03-010-F-S WET

Spectrum Filename: C:\GammaVision\Spectra\101F_26JUN2006_1648.An1

Acquisition information
Start time: 26-Jun-2006 16:48:52
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: 1.9270E+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	26-Jun-2006 14:30:00
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. 14 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.2315

***** 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	213.	13.96	1.00	1.651E-02				
74.73	213.	13.96	1.00	1.651E-02	74.81	9.600	9.187E-01	PB212
77.12	240.	12.13	1.01	1.720E-02	77.11	17.500	5.580E-01	PB212
					77.11	10.700	8.985E-01	PB214
87.15	86.	31.40	1.01	1.923E-02	86.45	32.740	9.688E-02	EU155
90.02	67.	41.10	1.02	1.960E-02	88.04	3.790	PBC<MDA	CD109
93.21	106.	23.97	1.02	1.996E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
128.50	72.	38.35	1.01	2.110E-02				
186.53	73.	32.70	0.67	1.855E-02	185.99	3.280	8.433E-01	RA226
209.53	109.	28.50	1.37	1.720E-02				
238.68	591.	4.94	1.12	1.558E-02				
238.68	591.	4.94	1.12	1.558E-02	238.63	43.100	6.108E-01	PB212
241.68	75.	26.90	1.12	1.542E-02	241.00	3.900	PBC<MDA	RA224
					241.92	7.470	4.550E-01	PB214
295.37	109.	15.21	1.17	1.291E-02	295.22	19.200	3.031E-01	PB214
300.51	65.	29.09	1.41	1.271E-02				
338.46	113.	20.91	1.28	1.135E-02	338.40	12.010	5.706E-01	AC228
352.00	229.	11.21	1.07	1.092E-02	351.99	37.100	3.925E-01	PB214
463.07	30.	30.44	1.50	8.342E-03	463.51	10.000	2.482E-01	SB125
510.95	103.	19.25	1.68	7.587E-03	510.72	22.500	3.563E-01	TL208
583.11	171.	9.57	1.11	6.685E-03	583.14	86.000	2.062E-01	TL208
609.28	173.	10.80	1.38	6.413E-03	609.32	46.090	4.078E-01	BI214
910.85	103.	12.01	1.41	4.447E-03	911.07	29.000	5.516E-01	AC228
968.64	81.	17.04	1.70	4.213E-03	968.90	17.460	7.684E-01	AC228
1120.42	41.	21.90	0.81	3.710E-03	1120.28	15.040	5.104E-01	BI214
1460.41	501.	4.47	1.98	2.943E-03	1460.75	10.700	1.111E+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
149.02	74.72	337.	213.	0.107	41.89	1.005	BI-207 D
173.87	87.34	324.	86.	0.043	94.19	1.014	PB-214 lD
179.61	90.21	341.	67.	0.033	123.31	1.016	PB-214 lD
372.72	186.53	239.	73.	0.037	98.10	0.670	PA-234 l
418.74	209.53	320.	109.	0.055	85.51	1.373	AC-228 s
477.06	238.61	130.	591.	0.295	14.81	1.122	PB-212 D
600.77	300.51	117.	65.	0.032	87.27	1.415	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	149.10	74.77	790.	185.	0.093	66.07	1.499
PB-212	153.79	77.11	764.	177.	0.088	70.09	1.499D
PB-214	153.79	77.11	306.	236.	0.118	36.39	1.006D
PB-212	477.07	238.68	327.	537.	0.268	19.01	1.499
PB-214	483.54	241.92	129.	67.	0.033	80.09	1.124D
PB-214	590.48	295.37	85.	107.	0.054	45.64	1.170
AC-228	676.71	338.46	156.	111.	0.055	62.74	1.276s
PB-214	703.79	352.00	136.	227.	0.113	33.64	1.073s
SB-125	926.04	463.07	30.	30.	0.015	91.31	1.499s
TL-208	1021.85	510.95	106.	87.	0.043	57.74	1.676s
TL-208	1166.22	583.11	43.	169.	0.085	28.70	1.113
BI-214	1218.60	609.28	56.	172.	0.086	32.40	1.381s
AC-228	1822.04	910.85	21.	101.	0.051	36.02	1.408
AC-228	1937.70	968.64	36.	81.	0.040	51.13	1.702
BI-214	2241.42	1120.42	18.	41.	0.020	65.69	0.809s
K-40	2921.84	1460.41	2.	499.	0.249	13.40	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	MDA Value pCi/gm	COMMENTS
BE-7		-1.1531E-01					
			477.56	-1.153E-01	%(	3.809E-01 1.13E-01	G
K-40		1.1108E+01					
			1460.75	1.111E+01	(P	2.171E-01 4.98E-01	G
MN-54		2.2859E-02					
			834.81	2.286E-02	%(P	3.972E-02 1.23E-02	G
CO-57		9.6003E-03					
			122.07	9.600E-03	&(	4.232E-02 1.27E-02	G K
			136.43	-3.363E-03	%	3.620E-01 1.07E-01	G
CO-60		3.9842E-03					
			1332.51	3.984E-03	%(P	5.178E-02 1.42E-02	G K
			1173.23	3.808E-03	& P	5.541E-02 1.54E-02	G K
Sr-85		-1.4473E-02					
			514.00	-1.447E-02	%(	5.601E-02 1.66E-02	G
Kr-85		-3.5909E+02					
			513.99	-3.591E+02	%(P	1.296E+03 3.84E+02	G
Y-88		-7.5395E-05					
			1836.01	-7.540E-05	%(	3.448E-02 8.05E-03	G K
			898.02	-3.794E-03	% P	4.020E-02 1.11E-02	G
NB-94		1.0877E-04					
			871.10	1.088E-04	&(P	4.410E-02 1.21E-02	G K
			702.50	-1.340E-02	% P	5.121E-02 1.51E-02	G K
Ag-108M		-1.7636E-03					
			722.95	-1.764E-03	%(	4.230E-02 1.18E-02	G K
			614.37	-1.050E-02	% P	5.023E-02 1.47E-02	G
			433.93	-6.334E-05	&	3.216E-02 9.04E-03	G
CD-109		2.8913E-02					
			88.04	2.891E-02	%(P	1.251E+00 3.72E-01	G
SN-113		1.1104E-02					
			391.71	1.110E-02	%(	4.672E-02 1.37E-02	G K
			255.04	1.607E-01	% P	1.401E+00 4.11E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	4.6641E-02						
		427.95	-2.146E-02	&(P	1.249E-01	3.64E-02	G K
		600.77	-7.575E-03	& P	2.220E-01	6.27E-02	G
		636.15	6.845E-03	% P	3.069E-01	8.50E-02	G
		463.51	2.482E-01	*(P	2.388E-01	7.92E-02	G
		176.29	-1.287E-02	% P	5.817E-01	1.71E-01	G
I-131	9.0932E-03						
		364.48	9.093E-03	%(	3.715E-02	1.09E-02	G K
		636.97	6.811E-02	%	4.900E-01	1.40E-01	G
		284.29	-1.446E-01	%	5.769E-01	1.72E-01	G
CS-134	-2.0908E-02						
		604.66	-2.091E-02	%(P	5.521E-02	1.65E-02	G K
		795.76	-4.851E-04	% P	4.566E-02	1.24E-02	G
		569.29	-2.954E-03	% P	2.921E-01	8.29E-02	G
		801.84	3.742E-02	%	4.514E-01	1.26E-01	G
CS-137	1.3603E-02						
		661.62	1.360E-02	%(P	4.451E-02	1.30E-02	G
CE-139	1.1691E-02						
		165.85	1.169E-02	%(P	4.274E-02	1.28E-02	G
EU-152	1.5321E-02						
		121.78	1.532E-02	&(P	1.336E-01	3.98E-02	G K
		344.30	1.243E-02	% P	1.260E-01	3.67E-02	G
		1408.08	6.636E-02	& P	1.746E-01	5.14E-02	G
		964.00	1.694E-01	& P	3.553E-01	1.08E-01	G
		1112.07	3.176E-02	% P	3.721E-01	1.04E-01	G
		778.90	1.941E-02	% P	3.487E-01	9.81E-02	G
EU-154	1.1359E-02						
		123.10	1.136E-02	%(P	8.802E-02	2.62E-02	G K
		1274.80	-8.925E-03	% P	1.579E-01	4.36E-02	G
		723.30	-2.366E-03	& P	3.121E-01	8.92E-02	G
		1004.80	-5.272E-03	& P	3.073E-01	8.54E-02	G
EU-155	4.7763E-03						
		86.45	4.776E-03	&(	1.610E-01	4.80E-02	G K
		105.31	6.961E-02	%	1.849E-01	5.58E-02	G
HG-203	2.6924E-02						
		279.17	2.692E-02	&(	3.688E-02	1.14E-02	G K
		72.87	-1.139E-01	% P	1.044E+00	3.12E-01	G
		70.83	-4.314E-03	%	1.867E+00	5.56E-01	G
		82.50	-7.348E-02	&	1.903E+00	5.65E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	2.0619E-01						
		583.14	2.062E-01	(P	4.057E-02	2.00E-02	G
		510.72	3.563E-01	+ P	2.083E-01	8.12E-02	G
PB-212	5.6093E-01						
		238.63	5.609E-01	(P	9.087E-02	3.60E-02	G K
							Energy duplication
		77.11	4.116E-01	-	3.063E-01	9.62E-02	G
		74.81	8.180E-01	& P	5.903E-01	1.85E-01	G
PB-214	3.9491E-01						
		351.99	3.925E-01	@(P	9.878E-02	4.44E-02	G K
		295.22	3.031E-01	- P	1.290E-01	4.69E-02	G
							Energy duplication
		77.11	8.985E-01	+ P	3.209E-01	1.11E-01	G
		241.92	4.071E-01	(P	3.394E-01	1.10E-01	G
BI-212	2.3529E-01						
		727.17	2.353E-01	%(P	3.561E-01	1.11E-01	G K
		1620.56	3.170E-01	%	1.267E+00	3.52E-01	G
		785.42	6.007E-01	% P	2.035E+00	5.96E-01	G
BI-214	4.3307E-01						
		609.32	4.078E-01	@(P	8.925E-02	4.43E-02	G K
		1764.51	1.075E-01	% P	2.615E-01	7.72E-02	G
		1120.28	5.104E-01	(P	2.851E-01	1.13E-01	G
RA-224	5.3558E-01						
		241.00	5.356E-01	%(P	1.134E+00	3.44E-01	G
RA-226	8.0642E-01						
		185.99	8.064E-01	%(	1.097E+00	3.37E-01	G
AC-228	5.5719E-01						
		911.07	5.516E-01	(P	1.297E-01	6.74E-02	G K
		968.90	7.684E-01	+ P	2.940E-01	1.32E-01	G
		338.40	5.706E-01	*(P	3.135E-01	1.22E-01	G
TH-227	-1.1477E-01						
		236.00	-1.148E-01	%(P	4.207E-01	1.26E-01	G K
		256.25	-1.952E-01	& P	5.303E-01	1.59E-01	G
PA-234	-7.2114E-03						
		98.44	-7.211E-03	&(	1.425E-01	4.22E-02	G K
		946.00	-1.782E-02	&	2.109E-01	5.85E-02	G
		131.28	-4.139E-02	%	1.938E-01	5.80E-02	G
		94.67	-9.222E-02	%	3.053E-01	9.19E-02	G
		883.24	-4.580E-02	%	3.868E-01	1.10E-01	G
		926.70	1.503E-02	%	3.363E-01	9.13E-02	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26 0.000E+00 %   4.322E-01 1.23E-01 G

TH-234       1.8723E-01
                           63.29 1.872E-01 %(P 1.910E+00 5.67E-01 G K
                           92.80 1.059E+00 % P 1.530E+00 4.67E-01 G
                           92.38 1.203E+00 & P 1.812E+00 5.52E-01 G

AM-241      -4.1467E-02
                           59.54-4.147E-02 %(P 2.569E-01 7.66E-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

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
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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	-1.1517E-01	-1.1531E-01	3.3914E-01	3.3920E-01	3.804E-01
K-40		1.1108E+01	1.1108E+01	1.4957E+00	1.6220E+00	
MN-54	#A	2.2854E-02	2.2859E-02	3.6776E-02	3.6798E-02	3.971E-02
CO-57	#B	9.5979E-03	9.6003E-03	3.8021E-02	3.8024E-02	4.231E-02
CO-60	#B	3.9841E-03	3.9842E-03	4.2612E-02	4.2612E-02	5.178E-02

Sr-85	#A	-1.4458E-02	-1.4473E-02	4.9917E-02	4.9924E-02	5.595E-02
Kr-85	#A	-3.5909E+02	-3.5909E+02	1.3266E+03	1.3268E+03	1.296E+03
Y-88	#B	-7.5348E-05	-7.5395E-05	2.4150E-02	2.4150E-02	3.446E-02
NB-94	#B	1.0877E-04	1.0877E-04	3.6390E-02	3.6390E-02	4.410E-02
Ag-108M	#B	-1.7636E-03	-1.7636E-03	3.5339E-02	3.5339E-02	4.230E-02
CD-109	#A	2.8909E-02	2.8913E-02	1.1164E+00	1.1164E+00	1.251E+00
SN-113	#B	1.1097E-02	1.1104E-02	4.1168E-02	4.1173E-02	4.670E-02
SB-125	#B	4.6638E-02	4.6641E-02	4.4674E-02	4.4752E-02	1.249E-01
I-131	#B	9.0179E-03	9.0932E-03	3.2832E-02	3.2836E-02	3.684E-02
CS-134	#B	-2.0906E-02	-2.0908E-02	5.2827E-02	5.2841E-02	5.520E-02
CS-137	#A	1.3603E-02	1.3603E-02	3.9119E-02	3.9126E-02	4.451E-02
CE-139	#A	1.1686E-02	1.1691E-02	3.8418E-02	3.8424E-02	4.272E-02
EU-152	#B	1.5321E-02	1.5321E-02	1.1942E-01	1.1942E-01	1.336E-01
EU-154	#B	1.1359E-02	1.1359E-02	7.8612E-02	7.8614E-02	8.802E-02
EU-155	#B	4.7761E-03	4.7763E-03	1.4398E-01	1.4398E-01	1.610E-01
HG-203	#B	2.6886E-02	2.6924E-02	3.4327E-02	3.4361E-02	3.683E-02
TL-208		2.0619E-01	2.0619E-01	6.0005E-02	6.1126E-02	
PB-212	#	5.6093E-01	5.6093E-01	1.0788E-01	1.1244E-01	9.087E-02
PB-214		3.9491E-01	3.9491E-01	1.3401E-01	1.3585E-01	
BI-212	#B	2.3529E-01	2.3529E-01	3.3281E-01	3.3307E-01	3.561E-01
BI-214		4.3307E-01	4.3307E-01	1.4120E-01	1.4331E-01	
RA-224	#A	5.3558E-01	5.3558E-01	1.0312E+00	1.0317E+00	1.134E+00
RA-226	#A	8.0642E-01	8.0642E-01	1.0124E+00	1.0134E+00	1.097E+00
AC-228		5.5719E-01	5.5719E-01	2.0437E-01	2.0678E-01	
TH-227	#B	-1.1477E-01	-1.1477E-01	3.9007E-01	3.9012E-01	4.207E-01
PA-234	#B	-7.2114E-03	-7.2114E-03	1.2668E-01	1.2668E-01	1.425E-01
TH-234	#B	1.8723E-01	1.8723E-01	1.7017E+00	1.7017E+00	1.910E+00
AM-241	#A	-4.1467E-02	-4.1467E-02	2.5328E-01	2.5329E-01	2.569E-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) 1.2699698E+01 pCi/gm
Total Decayed Activity (270.1 to 1999.1 keV) 1.2699698E+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_28JUN2006_1935.An1

Sample description
FSS-OOL-10-03-028-F-B

Spectrum Filename: C:\GammaVision\Spectra\101F_28JUN2006_1935.An1

Acquisition information
Start time: 28-Jun-2006 19:35:39
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: 2.1710E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 2.1710E+03) =
4.6062E+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	26-Jun-2006 16:05:00
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. 3 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
82.82	188.	26.35	1.50	1.843E-02	82.50	2.240	2.929E+00	HG203
85.80	163.	26.17	0.95	1.899E-02				
93.30	70.	38.95	1.02	1.994E-02	92.80	3.000	PBC<MDA	TH234
96.40	138.	20.33	1.02	2.023E-02	94.67	15.500	2.759E-01	PA234
99.63	99.	27.07	1.02	2.047E-02				
103.92	88.	33.27	1.03	2.073E-02				
206.28	122.	27.70	1.56	1.739E-02				
231.43	72.	34.54	1.58	1.596E-02				
264.26	747.	4.40	1.14	1.428E-02				
267.66	109.	20.89	1.14	1.412E-02				
326.67	196.	14.03	1.31	1.174E-02				
332.43	44.	33.39	1.21	1.155E-02				
363.40	50.	34.56	1.36	1.059E-02				
363.40	50.	34.56	1.36	1.059E-02	364.48	81.240	4.409E-02	I131
374.52	173.	12.87	1.23	1.028E-02				
389.69	335.	9.42	1.40	9.890E-03				
512.44	48.	25.93	1.57	7.566E-03				
512.44	48.	25.93	1.57	7.566E-03	514.00	99.270	4.108E-02	Sr85
565.51	144.	16.18	2.04	6.883E-03				
645.60	215.	8.56	1.39	6.074E-03				
674.51	189.	10.35	1.36	5.832E-03				
804.77	68.	20.80	1.67	4.966E-03				
1008.64	177.	9.40	1.80	4.066E-03				
1072.25	90.	22.65	1.89	3.855E-03				
1617.09	720.	3.91	2.09	2.687E-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	
186.18	93.25	339.	70.	0.035	116.86	1.018	U-235	lD
192.38	96.35	324.	138.	0.069	60.99	1.020	SE-75	lD
207.34	103.87	659.	107.	0.053	105.85	1.863	NP-239	sM
412.23	206.28	408.	122.	0.061	83.10	1.564	U-235	sM
462.55	231.43	262.	72.	0.036	101.42	1.577	CE-143	sM
528.25	264.24	167.	747.	0.374	13.20	1.140	TA-182	D
535.04	267.64	207.	109.	0.055	62.68	1.142	-	D
653.12	326.67	194.	196.	0.098	42.10	1.310	AC-228	sM
664.65	332.43	91.	44.	0.022	100.17	1.206	U-237	M
748.86	374.52	129.	173.	0.086	38.60	1.231	PA-234	sM
779.21	389.69	162.	351.	0.175	22.25	1.403	RH-106M	M
1024.82	512.44	38.	62.	0.031	56.81	1.571	RH-106M	s
1131.01	565.51	79.	166.	0.083	32.61	2.043	J-134	s
1291.27	645.60	52.	215.	0.108	25.69	1.389	RH-106M	
1349.11	674.51	71.	189.	0.094	31.06	1.362	SB-126	

Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM	Suspected	
1609.78	804.77	29.	83.	0.041	43.15	1.667	PA-234	s
2017.75	1008.64	33.	178.	0.089	26.33	1.803	BR-82	s
2145.04	1072.25	76.	90.	0.045	67.95	1.894	J-134	
3235.40	1617.09	-8.	743.	0.371	10.90	2.093	J-134	

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	165.21	82.82	1134.	188.	0.094	79.04	1.499
I-131	726.10	363.15	123.	51.	0.025	102.19	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		-2.7957E-02					
			477.56	-2.796E-02	&(	3.209E-01 9.22E-02	G
K-40		-4.5076E-02					
			1460.75	-4.508E-02	%(P	6.469E-01 1.75E-01	G
MN-54		-1.9563E-03					
			834.81	-1.956E-03	&(P	4.692E-02 1.32E-02	G
CO-57		-1.0642E-02					
			122.07	-1.064E-02	%(	4.482E-02 1.35E-02	G K
			136.43	-1.780E-03	&	3.706E-01 1.10E-01	G
CO-60		-2.3605E-02					
			1332.51	-2.361E-02	&(P	8.485E-02 2.51E-02	G K
			1173.23	-9.032E-03	% P	5.995E-02 1.72E-02	G K

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
Sr-85	-6.2917E-03						
		514.00	-6.292E-03	%(	2.895E-02	8.41E-03	G
Kr-85	-1.4632E+02						
		513.99	-1.463E+02	%(P	7.896E+02	2.27E+02	G
Y-88	-4.7009E-03						
		1836.01	-4.701E-03	%(	5.086E-02	1.37E-02	G K
		898.02	1.489E-02	% P	3.700E-02	1.10E-02	G
NB-94	2.7548E-03						
		871.10	2.755E-03	&(P	3.727E-02	1.04E-02	G K
		702.50	1.712E-03	& P	3.370E-02	9.41E-03	G K
Ag-108M	5.8654E-03						
		722.95	5.865E-03	&(	3.587E-02	1.02E-02	G K
		614.37	-1.228E-04	% P	4.437E-02	1.26E-02	G
		433.93	1.583E-02	%	4.003E-02	1.20E-02	G
CD-109	-8.1188E-01						
		88.04	-8.119E-01	&(P	1.369E+00	4.17E-01	G
SN-113	-2.1192E-02						
		391.71	-2.119E-02	%(	5.485E-02	1.65E-02	G K
		255.04	2.294E-01	& P	1.616E+00	4.78E-01	G
SB-125	5.3802E-03						
		427.95	5.380E-03	%(P	1.210E-01	3.49E-02	G K
		600.77	1.212E-01	% P	1.843E-01	5.74E-02	G
		636.15	-3.189E-03	& P	3.492E-01	9.83E-02	G
		463.51	-1.594E-02	& P	4.201E-01	1.21E-01	G
		176.29	1.057E-01	& P	5.604E-01	1.67E-01	G
I-131	4.4216E-02						
		364.48	4.422E-02	*(	4.758E-02	1.51E-02	G K
		636.97	7.953E-02	%	6.373E-01	1.83E-01	G
		284.29	1.946E-01	%	6.696E-01	2.00E-01	G
CS-134	-1.2550E-02						
		604.66	-1.255E-02	%(P	4.298E-02	1.27E-02	G K
		795.76	1.406E-02	& P	3.921E-02	1.16E-02	G
		569.29	-1.337E-01	% P	3.453E-01	1.04E-01	G
		801.84	-2.102E-01	&	7.062E-01	2.10E-01	G
CS-137	9.0986E-03						
		661.62	9.099E-03	&(P	4.847E-02	1.40E-02	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments

CE-139      -9.0649E-03
                          165.85-9.065E-03 %(P 4.706E-02 1.41E-02 G

EU-152      -3.3493E-02
                          121.78-3.349E-02 %(P 1.350E-01 4.05E-02 G K
                          344.30 3.132E-03 & P 1.321E-01 3.84E-02 G
                         1408.08-1.652E-02 & P 2.921E-01 8.14E-02 G
                          964.00 1.509E-01 & P 2.557E-01 7.92E-02 G
                         1112.07 2.144E-02 & P 4.350E-01 1.23E-01 G
                          778.90-3.684E-02 & P 3.552E-01 1.02E-01 G

EU-154      -3.3228E-02
                          123.10-3.323E-02 &(P 9.157E-02 2.76E-02 G K
                         1274.80 5.791E-02 & P 1.667E-01 4.94E-02 G
                          723.30 1.047E-02 & P 2.111E-01 5.97E-02 G
                         1004.80-1.063E-02 % P 9.740E-01 2.89E-01 G

EU-155      -7.9971E-02
                           86.45-7.997E-02 &(  1.650E-01 5.01E-02 G K
                          105.31-4.387E-03 %   1.813E-01 5.40E-02 G

HG-203       7.8356E-02
                          279.17 0.000E+00 %(  4.948E-02 1.45E-02 G K
                           72.87-3.591E-02 % P 8.180E-01 2.43E-01 G
                           70.83 0.000E+00 &   1.592E+00 4.73E-01 G
                           82.50 2.929E+00 &(  2.486E+00 7.72E-01 G

TL-208       7.1355E-03
                          583.14 7.136E-03 %(P 4.454E-02 1.28E-02 G
                          510.72-9.494E-02 & P 1.970E-01 5.41E-02 G

PB-212       1.6014E-02
                          238.63 1.601E-02 %(P 9.117E-02 2.71E-02 G K
                                                           Energy duplication
                           77.11 8.762E-02 &   2.877E-01 8.67E-02 G
                           74.81-4.439E-02 & P 5.003E-01 1.48E-01 G

PB-214      -2.0278E-02
                          351.99-2.028E-02 %(P 8.726E-02 2.56E-02 G K
                          295.22-6.066E-02 % P 1.965E-01 5.86E-02 G
                                                           Energy duplication
                           77.11 1.307E-01 & P 4.716E-01 1.42E-01 G
                          241.92-1.751E-01 & P 5.209E-01 1.57E-01 G

BI-212      -6.3451E-03
                          727.17-6.345E-03 %(P 3.334E-01 9.25E-02 G K
                         1620.56-1.918E+00 %   4.662E+00 1.40E+00 G
                          785.42 6.895E-01 % P 2.084E+00 6.16E-01 G
```

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments

BI-214      -2.3340E-03
                          609.32-2.334E-03 &(P 9.315E-02 2.64E-02 G K
                         1764.51-7.538E-02 & P 3.824E-01 1.07E-01 G
                         1120.28-5.771E-02 % P 3.551E-01 1.01E-01 G

RA-224      -2.1429E-01
                          241.00-2.143E-01 %(P 1.017E+00 3.03E-01 G

RA-226       1.5194E-01
                          185.99 1.519E-01 %(  1.145E+00 3.41E-01 G

AC-228      -9.0107E-03
                          911.07-9.011E-03 &(P 2.002E-01 5.60E-02 G K
                          968.90-2.463E-02 % P 2.226E-01 6.10E-02 G
                          338.40-9.985E-03 % P 3.119E-01 9.04E-02 G

TH-227      -8.4471E-03
                          236.00-8.447E-03 &(P 3.791E-01 1.12E-01 G K
                          256.25-8.767E-02 % P 5.648E-01 1.68E-01 G

PA-234      -1.2465E-01
                           98.44-1.247E-01 &(  1.783E-01 5.45E-02 G K
                          946.00 4.883E-03 %   1.732E-01 4.70E-02 G
                          131.28-4.806E-02 %   1.974E-01 5.93E-02 G
                           94.67 1.894E-01 &   2.795E-01 8.54E-02 G
                          883.24-2.366E-03 &   3.996E-01 1.12E-01 G
                          926.70 5.853E-04 &   4.739E-01 1.33E-01 G
                          569.26-1.941E-01 %   5.105E-01 1.53E-01 G

TH-234       6.3894E-02
                           63.29 6.389E-02 &(P 1.742E+00 5.16E-01 G K
                           92.80 1.804E-01 % P 1.578E+00 4.72E-01 G
                           92.38-2.600E-01 % P 1.858E+00 5.52E-01 G

AM-241      -1.7819E-03
                           59.54-1.782E-03 &(P 2.337E-01 6.92E-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:
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	-2.7189E-02	-2.7957E-02	2.7672E-01	2.7672E-01	3.121E-01
K-40	#A	-4.5076E-02	-4.5076E-02	2.3944E+00	2.3944E+00	6.469E-01
MN-54	#A	-1.9470E-03	-1.9563E-03	7.0013E-02	7.0013E-02	4.670E-02
CO-57	#B	-1.0584E-02	-1.0642E-02	4.0369E-02	4.0373E-02	4.458E-02
CO-60	#B	-2.3587E-02	-2.3605E-02	7.6268E-02	7.6280E-02	8.478E-02
Sr-85	#A	-6.1490E-03	-6.2917E-03	2.5234E-02	2.5237E-02	2.830E-02
Kr-85	#A	-1.4632E+02	-1.4632E+02	9.3027E+02	9.3030E+02	7.896E+02
Y-88	#B	-4.6358E-03	-4.7009E-03	4.1140E-02	4.1141E-02	5.015E-02
NB-94	#B	2.7548E-03	2.7548E-03	3.1116E-02	3.1116E-02	3.727E-02
Ag-108M	#B	5.8652E-03	5.8654E-03	3.0657E-02	3.0659E-02	3.587E-02
CD-109	#A	-8.0922E-01	-8.1188E-01	1.2630E+00	1.2638E+00	1.365E+00
SN-113	#B	-2.0920E-02	-2.1192E-02	4.9443E-02	4.9457E-02	5.415E-02
SB-125	#B	5.3723E-03	5.3802E-03	1.0483E-01	1.0483E-01	1.208E-01
I-131	#A	3.6747E-02	4.4216E-02	4.5187E-02	4.5256E-02	3.954E-02
CS-134	#B	-1.2526E-02	-1.2550E-02	4.1863E-02	4.1869E-02	4.290E-02
CS-137	#A	9.0973E-03	9.0986E-03	4.2143E-02	4.2146E-02	4.846E-02
CE-139	#A	-8.9674E-03	-9.0649E-03	4.3468E-02	4.3471E-02	4.656E-02
EU-152	#B	-3.3482E-02	-3.3493E-02	1.2744E-01	1.2746E-01	1.349E-01
EU-154	#B	-3.3212E-02	-3.3228E-02	8.6195E-02	8.6215E-02	9.152E-02
EU-155	#B	-7.9906E-02	-7.9971E-02	1.5016E-01	1.5023E-01	1.649E-01
HG-203	#F	7.5893E-02	7.8356E-02	6.1933E-02	6.2091E-02	4.793E-02
TL-208	#A	7.1355E-03	7.1355E-03	3.8459E-02	3.8461E-02	4.454E-02
PB-212	#B	1.6014E-02	1.6014E-02	8.1245E-02	8.1250E-02	9.117E-02
PB-214	#B	-2.0278E-02	-2.0278E-02	1.0372E-01	1.0372E-01	8.726E-02
BI-212	#B	-6.3451E-03	-6.3451E-03	1.6100E+01	1.6100E+01	3.334E-01

BI-214 #B	-2.3340E-03	-2.3340E-03	1.7522E-01	1.7522E-01	9.315E-02

RA-224	#A	-2.1429E-01	-2.1429E-01	9.7504E-01	9.7511E-01	1.017E+00
RA-226	#A	1.5194E-01	1.5194E-01	1.0243E+00	1.0244E+00	1.145E+00
AC-228	#B	-9.0107E-03	-9.0107E-03	6.2723E-01	6.2723E-01	2.002E-01
TH-227	#B	-8.4471E-03	-8.4471E-03	4.8704E-01	4.8704E-01	3.791E-01
PA-234	#B	-1.2465E-01	-1.2465E-01	1.6352E-01	1.6367E-01	1.783E-01
TH-234	#B	6.3894E-02	6.3894E-02	1.5484E+00	1.5484E+00	1.742E+00
AM-241	#A	-1.7819E-03	-1.7819E-03	3.6885E-01	3.6885E-01	2.337E-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 (565.5 to 1999.1 keV) 0.0000000E+00 pCi/gm
Total Decayed Activity (565.5 to 1999.1 keV) 0.0000000E+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: 101F_28JUN2006_2012.An1

Sample description
FSS-OOL-10-03-022-F-B WET

Spectrum Filename: C:\GammaVision\Spectra\101F_28JUN2006_2012.An1

Acquisition information
Start time: 28-Jun-2006 20:12:50
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: 2.3670E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 2.3670E+03) =
4.2248E+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	26-Jun-2006 15:37:00
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. 1 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
82.87	208.	24.78	1.50	1.843E-02	82.50	2.240	2.972E+00	HG203
96.75	120.	25.83	1.02	2.026E-02				
103.07	174.	17.71	1.03	2.069E-02				
142.23	124.	33.82	1.11	2.077E-02				
205.93	174.	19.30	1.72	1.741E-02				
231.57	78.	39.11	1.04	1.596E-02				
264.31	747.	4.49	1.14	1.428E-02				
267.59	113.	19.68	1.14	1.413E-02				
307.00	58.	40.62	0.50	1.246E-02				
326.83	195.	12.16	1.46	1.174E-02				
332.16	62.	30.43	1.59	1.156E-02				
374.71	140.	16.56	1.15	1.028E-02				
389.63	322.	10.16	1.45	9.891E-03				
512.58	25.	29.95	1.50	7.590E-03	510.72	22.500	PBC<MDA	TL208
565.61	142.	15.41	1.63	6.881E-03				
645.58	236.	8.43	1.69	6.075E-03				
674.54	213.	9.16	1.68	5.832E-03				
879.89	66.	28.35	1.25	4.586E-03				
1008.97	174.	9.13	1.61	4.065E-03				
1072.19	140.	15.26	1.64	3.855E-03				
1617.00	680.	3.94	2.03	2.687E-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
205.82	103.12	651.	188.	0.094	61.69	1.457	GD-153 s
284.07	142.23	654.	124.	0.062	101.47	1.107	TC-99M s

411.52	205.93	396.	174.	0.087	57.89	1.720	U-235	s
462.83	231.57	351.	78.	0.039	108.00	1.038	CE-143	s
528.34	264.28	191.	747.	0.374	13.48	1.140	TA-182	D
534.90	267.55	192.	113.	0.057	59.05	1.142	-	D
613.75	307.00	202.	58.	0.029	121.87	0.500	-	s
653.43	326.83	160.	195.	0.098	36.48	1.461	AC-228	s
664.10	332.16	138.	62.	0.031	91.29	1.592	U-237	s
749.24	374.71	159.	140.	0.070	49.68	1.146	-	
779.09	389.63	205.	325.	0.162	25.05	1.455	RH-106M	
1131.21	565.61	95.	145.	0.073	37.76	1.626	J-134	s
1291.23	645.58	64.	236.	0.118	25.30	1.694	RH-106M	s
1349.18	674.54	59.	213.	0.106	27.47	1.675	SB-126	
1760.10	879.89	63.	70.	0.035	60.44	1.247	CE-143	
2018.41	1008.97	5.	194.	0.097	22.09	1.612	CS-138	s
2144.91	1072.19	71.	140.	0.070	45.78	1.644	J-134	s
3235.23	1617.00	-20.	708.	0.354	10.96	2.031	J-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
HG-203	165.32	82.87	1224.	208.	0.104	74.35	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		1.5925E-02					
			477.56	1.593E-02	&(	3.898E-01 1.13E-01	G
K-40		6.5531E-02					
			1460.75	6.553E-02	%(P	4.624E-01 1.27E-01	G
MN-54		3.5635E-03					
			834.81	3.563E-03	&(P	4.321E-02 1.23E-02	G
CO-57		-2.4038E-03					
			122.07	-2.404E-03	%(	3.649E-02 1.08E-02	G K
			136.43	7.937E-02	&	3.031E-01 9.10E-02	G
CO-60		2.4809E-03					
			1332.51	2.481E-03	%(P	5.542E-02 1.55E-02	G K
			1173.23	8.316E-03	% P	5.405E-02 1.55E-02	G K
Sr-85		1.4018E-03					
			514.00	1.402E-03	&(	3.326E-02 9.51E-03	G
Kr-85		1.5341E+01					
			513.99	1.534E+01	&(P	7.547E+02 2.14E+02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
Y-88	0.0000E+00						
		1836.01	0.000E+00	%(	4.040E-02	1.03E-02	G K
		898.02	7.003E-03	& P	3.658E-02	1.04E-02	G
NB-94	-1.6453E-04						
		871.10	-1.645E-04	%(P	4.985E-02	1.41E-02	G K
		702.50	1.190E-02	% P	3.151E-02	9.39E-03	G K
Ag-108M	1.1252E-02						
		722.95	1.125E-02	&(	4.028E-02	1.18E-02	G K
		614.37	-3.275E-03	% P	4.038E-02	1.16E-02	G
		433.93	1.010E-02	&	3.496E-02	1.04E-02	G
CD-109	-4.4986E-01						
		88.04	-4.499E-01	%(P	1.270E+00	3.84E-01	G
SN-113	-2.4851E-03						
		391.71	-2.485E-03	%(	6.657E-02	1.95E-02	G K
		255.04	-3.140E-01	% P	1.874E+00	5.58E-01	G
SB-125	-6.9790E-04						
		427.95	-6.979E-04	%(P	1.236E-01	3.57E-02	G K
		600.77	9.151E-03	& P	1.678E-01	4.74E-02	G
		636.15	-2.356E-03	% P	3.797E-01	1.08E-01	G
		463.51	3.819E-02	% P	3.385E-01	9.81E-02	G
		176.29	-9.031E-03	% P	5.706E-01	1.69E-01	G
I-131	2.7074E-02						
		364.48	2.707E-02	%(	5.053E-02	1.54E-02	G K
		636.97	6.443E-02	%	6.563E-01	1.89E-01	G
		284.29	8.712E-03	%	6.310E-01	1.85E-01	G
CS-134	-8.4157E-03						
		604.66	-8.416E-03	%(P	3.969E-02	1.16E-02	G K
		795.76	-5.577E-04	& P	5.303E-02	1.49E-02	G
		569.29	-2.622E-02	% P	2.894E-01	8.40E-02	G
		801.84	-1.615E-01	%	6.107E-01	1.81E-01	G
CS-137	5.7760E-03						
		661.62	5.776E-03	&(P	3.987E-02	1.14E-02	G
CE-139	1.6007E-02						
		165.85	1.601E-02	%(P	4.360E-02	1.32E-02	G
EU-152	-9.6120E-03						
		121.78	-9.612E-03	%(P	1.254E-01	3.74E-02	G K
		344.30	-1.453E-03	% P	1.411E-01	4.12E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
		1408.08	4.907E-02	% P	2.813E-01	8.07E-02	G
		964.00	-5.579E-03	% P	2.856E-01	7.86E-02	G
		1112.07	2.016E-02	% P	3.528E-01	9.89E-02	G
		778.90	1.307E-02	% P	2.513E-01	6.99E-02	G
EU-154	-7.5537E-04						
		123.10	-7.554E-04	&(P	8.643E-02	2.57E-02	G K
		1274.80	-1.102E-03	% P	1.644E-01	4.59E-02	G
		723.30	-8.128E-03	& P	1.811E-01	5.07E-02	G
		1004.80	-1.990E-01	% P	4.028E-01	1.22E-01	G
EU-155	-5.2197E-02						
		86.45	-5.220E-02	&(	1.437E-01	4.34E-02	G K
		105.31	-4.078E-02	&	1.466E-01	4.40E-02	G
HG-203	8.6516E-02						
		279.17	7.221E-03	%(	4.500E-02	1.34E-02	G K
		72.87	-4.279E-02	& P	7.823E-01	2.33E-01	G
		70.83	4.218E-01	&	1.528E+00	4.60E-01	G
		82.50	2.972E+00	?(	2.369E+00	7.36E-01	G
TL-208	7.5894E-03						
		583.14	7.589E-03	&(P	3.744E-02	1.08E-02	G
		510.72	8.428E-02	& P	1.409E-01	4.13E-02	G
PB-212	-7.0810E-07						
		238.63	-7.081E-07	%(P	8.614E-02	2.54E-02	G K
							Energy duplication
		77.11	3.305E-02	%	2.801E-01	8.38E-02	G
		74.81	-1.141E-01	% P	5.476E-01	1.64E-01	G
PB-214	1.1789E-02						
		351.99	1.179E-02	&(P	9.580E-02	2.81E-02	G K
		295.22	-7.136E-02	% P	2.079E-01	6.23E-02	G
							Energy duplication
		77.11	4.251E-02	% P	4.590E-01	1.37E-01	G
		241.92	6.136E-02	% P	4.708E-01	1.40E-01	G
BI-212	-6.1117E-02						
		727.17	-6.112E-02	&(P	3.673E-01	1.06E-01	G K
		1620.56	-2.116E+00	&	4.388E+00	1.33E+00	G
		785.42	1.917E-01	% P	1.823E+00	5.17E-01	G
BI-214	-2.1407E-03						
		609.32	-2.141E-03	%(P	9.038E-02	2.57E-02	G K
		1764.51	-4.118E-03	% P	3.537E-01	9.47E-02	G
		1120.28	-1.730E-02	& P	3.169E-01	8.81E-02	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments

RA-224      -6.7757E-03
                          241.00-6.776E-03 %(P 9.378E-01 2.77E-01 G

RA-226      -1.1622E-01
                          185.99-1.162E-01 &(  1.060E+00 3.16E-01 G

AC-228      -8.2646E-03
                          911.07-8.265E-03 %(P 1.462E-01 3.98E-02 G K
                          968.90-3.004E-02 % P 2.271E-01 6.34E-02 G
                          338.40-4.158E-02 % P 2.561E-01 7.47E-02 G

TH-227      -6.9070E-03
                          236.00-6.907E-03 %(P 3.394E-01 1.00E-01 G K
                          256.25-1.286E-01 % P 4.673E-01 1.39E-01 G

PA-234      -4.4415E-02
                           98.44-4.441E-02 &(  1.856E-01 5.58E-02 G K
                          946.00-3.661E-02 %   2.345E-01 6.75E-02 G
                          131.28-3.311E-02 %   1.883E-01 5.64E-02 G
                           94.67 5.480E-02 &   2.561E-01 7.69E-02 G
                          883.24-3.922E-02 &   3.844E-01 1.10E-01 G
                          926.70 0.000E+00 %   4.990E-01 1.42E-01 G
                          569.26-3.526E-02 %   4.277E-01 1.24E-01 G

TH-234       3.9317E-02
                           63.29 3.932E-02 %(P 1.729E+00 5.13E-01 G K
                           92.80 8.523E-02 % P 1.486E+00 4.43E-01 G
                           92.38-1.382E+00 & P 1.723E+00 5.25E-01 G

AM-241      -9.8392E-03
                           59.54-9.839E-03 %(P 2.218E-01 6.59E-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	1.5478E-02	1.5925E-02	3.3901E-01	3.3901E-01	3.789E-01
K-40	#A	6.5531E-02	6.5531E-02	3.8143E-01	3.8145E-01	4.624E-01
MN-54	#A	3.5462E-03	3.5635E-03	3.6842E-02	3.6842E-02	4.300E-02
CO-57	#B	-2.3903E-03	-2.4038E-03	3.2541E-02	3.2541E-02	3.628E-02
CO-60	#B	2.4790E-03	2.4809E-03	4.6444E-02	4.6444E-02	5.538E-02
Sr-85	#A	1.3693E-03	1.4018E-03	2.8528E-02	2.8528E-02	3.249E-02
Kr-85	#A	1.5341E+01	1.5341E+01	6.4303E+02	6.4303E+02	7.547E+02
Y-88	#B	0.0000E+00	0.0000E+00	3.0767E-02	3.0767E-02	3.983E-02
NB-94	#B	-1.6453E-04	-1.6453E-04	1.1279E-02	1.1279E-02	4.985E-02
Ag-108M	#B	1.1251E-02	1.1252E-02	3.5513E-02	3.5518E-02	4.028E-02
CD-109	#A	-4.4835E-01	-4.4986E-01	1.1696E+00	1.1699E+00	1.266E+00
SN-113	#B	-2.4525E-03	-2.4851E-03	5.8524E-02	5.8524E-02	6.570E-02
SB-125	#B	-6.9686E-04	-6.9790E-04	6.9842E-02	6.9842E-02	1.234E-01
I-131	#B	2.2413E-02	2.7074E-02	4.6193E-02	4.6219E-02	4.183E-02
CS-134	#B	-8.3988E-03	-8.4157E-03	3.9651E-02	3.9654E-02	3.961E-02
CS-137	#A	5.7752E-03	5.7760E-03	3.4220E-02	3.4222E-02	3.987E-02
CE-139	#A	1.5831E-02	1.6007E-02	3.9456E-02	3.9467E-02	4.312E-02
EU-152	#B	-9.6089E-03	-9.6120E-03	1.3040E-01	1.3041E-01	1.253E-01
EU-154	#B	-7.5500E-04	-7.5537E-04	7.1938E-01	7.1938E-01	8.639E-02
EU-155	#B	-5.2153E-02	-5.2197E-02	1.3028E-01	1.3031E-01	1.436E-01
HG-203	#F	8.3741E-02	8.6516E-02	6.4326E-02	6.4512E-02	4.356E-02
TL-208	#A	7.5894E-03	7.5894E-03	3.2367E-02	3.2369E-02	3.744E-02
PB-212	#B	-7.0810E-07	-7.0810E-07	7.6082E-02	7.6082E-02	8.614E-02
PB-214	#B	1.1789E-02	1.1789E-02	8.4421E-02	8.4424E-02	9.580E-02
BI-212	#B	-6.1117E-02	-6.1117E-02	3.8750E-01	3.8752E-01	3.673E-01
BI-214	#B	-2.1407E-03	-2.1407E-03	1.7075E-01	1.7075E-01	9.038E-02
RA-224	#A	-6.7757E-03	-6.7757E-03	1.1866E+00	1.1866E+00	9.378E-01
RA-226	#A	-1.1622E-01	-1.1622E-01	9.4717E-01	9.4720E-01	1.060E+00
AC-228	#B	-8.2646E-03	-8.2646E-03	4.4592E-01	4.4592E-01	1.462E-01
TH-227	#B	-6.9070E-03	-6.9070E-03	4.5621E-01	4.5621E-01	3.394E-01

PA-234 #B	-4.4415E-02	-4.4415E-02	1.6753E-01	1.6755E-01	1.856E-01

TH-234 #B	3.9317E-02	3.9317E-02	1.5389E+00	1.5389E+00	1.729E+00
AM-241 #A	-9.8391E-03	-9.8392E-03	2.7633E-01	2.7633E-01	2.218E-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 (306.6 to 1999.1 keV) 0.0000000E+00 pCi/gm
Total Decayed Activity (306.6 to 1999.1 keV) 0.0000000E+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: 101F_29JUN2006_1725.An1

Sample description
FSS-OOL-10-03-027-F-B

Spectrum Filename: C:\GammaVision\Spectra\101F_29JUN2006_1725.An1

Acquisition information

Start time:	29-Jun-2006 17:25:52
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:	2.1110E+03
Activity scaling factor:	1.0000E+06/(1.0000E+00* 2.1110E+03) = 4.7371E+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	26-Jun-2006 16:01:00
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. 21 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.3933

***** 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	253.	20.64	1.50	1.654E-02	72.87	6.400	1.667E+00	HG203
					74.81	9.600	1.020E+00	PB212
77.09	378.	13.83	1.50	1.720E-02	77.11	17.500	8.031E-01	PB212
					77.11	10.700	1.301E+00	PB214
77.09	374.	13.83	1.50	1.720E-02	77.11	17.500	7.952E-01	PB212
					77.11	10.700	1.301E+00	PB214
87.21	144.	23.49	1.01	1.926E-02	86.45	32.740	1.472E-01	EU155
89.69	86.	36.56	1.02	1.958E-02	88.04	3.790	PBC<MDA	CD109
93.24	171.	18.72	1.02	1.998E-02	92.38	2.570	2.012E+00	TH234
					92.80	3.000	1.770E+00	TH234
128.27	126.	36.53	0.96	2.111E-02				
186.41	119.	24.11	1.17	1.856E-02	185.99	3.280	1.250E+00	RA226
209.20	89.	38.34	0.87	1.722E-02				
238.87	944.	3.75	1.12	1.556E-02	238.63	43.100	8.940E-01	PB212
240.33	62.	29.76	1.50	1.545E-02	238.63	43.100	PBC<MDA	PB212
					241.00	3.900	6.583E-01	RA224
					241.92	7.470	PBC<MDA	PB214
242.09	137.	17.92	1.12	1.539E-02				
271.07	105.	24.57	1.39	1.397E-02				
295.44	230.	11.04	1.13	1.291E-02	295.22	19.200	5.879E-01	PB214
300.85	73.	30.17	1.32	1.269E-02				
328.73	69.	35.79	0.81	1.167E-02				
338.71	201.	13.25	1.08	1.134E-02	338.40	12.010	9.346E-01	AC228
352.09	314.	9.23	1.04	1.092E-02	351.99	37.100	4.920E-01	PB214
368.07	55.	31.32	1.24	1.046E-02				
463.52	77.	24.56	1.41	8.341E-03	463.51	10.000	5.826E-01	SB125
510.64	134.	18.71	1.85	7.592E-03	510.72	22.500	4.429E-01	TL208

583.51	303.	8.01	1.42	6.680E-03	583.14	86.000	3.348E-01	TL208
609.67	225.	8.98	1.24	6.409E-03	604.66	97.600	2.285E-01	CS134
					609.32	46.090	4.849E-01	BI214
727.35	59.	25.46	0.96	5.442E-03	727.17	11.800	5.793E-01	BI212
795.37	39.	28.04	1.28	5.018E-03				
795.37	39.	28.04	1.28	5.018E-03	795.76	85.400	5.722E-02	CS134
911.46	203.	8.71	1.68	4.445E-03	911.07	29.000	9.995E-01	AC228

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
969.07	148.	14.49	1.69	4.211E-03	968.90	17.460	1.282E+00	AC228
1120.49	46.	24.64	0.79	3.711E-03	1120.28	15.040	5.232E-01	BI214
1461.39	875.	3.46	1.83	2.941E-03	1460.75	10.700	1.775E+01	K40
1765.75	30.	19.66	1.09	2.481E-03	1764.51	15.920	4.823E-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	
174.00	87.58	498.	144.	0.072	70.48	1.014	PB-214	lD
178.95	90.05	453.	86.	0.043	109.68	1.016	PB-214	lD
256.16	128.27	754.	162.	0.081	75.70	0.959	AC-228	
418.07	209.20	448.	89.	0.045	115.01	0.866	AC-228	M
477.44	238.85	155.	944.	0.472	11.26	1.122	PB-212	D
483.89	242.08	234.	137.	0.069	53.76	1.124	PB-214	D
541.86	271.07	243.	105.	0.052	73.70	1.389	AC-228	s
601.46	300.85	181.	73.	0.037	90.50	1.317	PB-212	s
657.23	328.73	208.	69.	0.034	107.37	0.805	LA-140	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	149.42	74.93	1297.	253.	0.127	61.91	1.499
PB-212	153.79	77.11	1175.	378.	0.189	41.48	1.499D
PB-214	153.79	77.11	1178.	374.	0.187	41.48	1.499D
TH-234	185.92	93.17	1096.	172.	0.086	81.63	1.499s
RA-226	372.48	186.41	352.	119.	0.060	72.32	1.168
PB-212	477.40	238.85	579.	806.	0.403	16.35	1.499
RA-224	480.36	240.33	143.	62.	0.031	89.27	1.499
PB-214	590.64	295.45	238.	235.	0.118	33.74	1.499s
AC-228	677.20	338.71	184.	199.	0.100	39.74	1.078s
PB-214	704.06	352.13	160.	288.	0.144	25.44	1.499
SB-125	926.92	463.51	89.	68.	0.034	67.66	1.499D
TL-208	1021.21	510.64	154.	118.	0.059	56.12	1.847s
TL-208	1167.03	583.51	86.	301.	0.150	24.02	1.422s
BI-214	1219.38	609.67	69.	224.	0.112	26.95	1.240
Ag-108M	1223.66	611.81	140.	-50.	-0.025	110.09	1.499

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
BI-212	1454.86	727.35	62.	58.	0.029	76.37	0.964s
CS-134	1590.82	795.30	47.	39.	0.020	86.75	1.502
AC-228	1823.26	911.46	43.	201.	0.101	26.13	1.680s
AC-228	1938.55	969.07	79.	147.	0.074	43.47	1.694s
BI-214	2241.57	1120.49	33.	46.	0.023	73.93	0.791s
K-40	2923.80	1461.39	13.	873.	0.436	10.37	1.829
BI-214	3532.93	1765.75	2.	30.	0.015	58.97	1.087s

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	Peak MDA Value pCi/gm	COMMENTS
BE-7		3.5178E-02					
			477.56	3.518E-02	&(	3.985E-01 1.16E-01 G	
K-40		1.7748E+01					
			1460.75	1.775E+01	(P	3.978E-01 6.15E-01 G	
MN-54		2.7706E-02					
			834.81	2.771E-02	%(P	4.308E-02 1.34E-02 G	
CO-57		-1.4457E-02					
			122.07	-1.446E-02	%(	5.012E-02 1.51E-02 G K	
			136.43	1.505E-02	%	3.992E-01 1.19E-01 G	
CO-60		1.6963E-02					
			1332.51	1.696E-02	%(P	5.219E-02 1.53E-02 G K	
			1173.23	2.578E-03	% P	6.594E-02 1.86E-02 G K	
Sr-85		-3.3849E-03					
			514.00	-3.385E-03	%(	4.966E-02 1.44E-02 G	
Kr-85		-9.9838E+01					
			513.99	-9.984E+01	%(P	1.114E+03 3.23E+02 G	
Y-88		-8.7580E-03					
			1836.01	-8.758E-03	%(	5.193E-02 1.44E-02 G K	
			898.02	-5.898E-03	% P	4.527E-02 1.28E-02 G	
NB-94		1.6047E-02					
			871.10	1.605E-02	%(P	4.055E-02 1.21E-02 G K	
			702.50	2.083E-03	& P	4.620E-02 1.32E-02 G K	

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
Ag-108M	-8.0792E-03						
		722.95	-8.079E-03	&(	6.182E-02	1.80E-02	G K
		614.37	-5.510E-02	& P	6.435E-02	2.02E-02	G
		433.93	0.000E+00	%	5.014E-02	1.46E-02	G
CD-109	2.1490E-01						
		88.04	2.149E-01	%(P	1.473E+00	4.42E-01	G
SN-113	-1.1922E-02						
		391.71	-1.192E-02	%(	6.248E-02	1.84E-02	G K
		255.04	-7.736E-01	% P	2.051E+00	6.18E-01	G
SB-125	1.5284E-01						
		427.95	2.835E-02	%(P	1.296E-01	3.82E-02	G K
		600.77	6.039E-02	% P	2.288E-01	6.74E-02	G
		636.15	3.079E-02	% P	3.420E-01	9.75E-02	G
							Energy duplication
		463.51	5.213E-01	*(P	3.585E-01	1.20E-01	G
		176.29	1.030E-01	% P	6.493E-01	1.94E-01	G
I-131	-1.7386E-02						
		364.48	-1.739E-02	&(	6.689E-02	1.99E-02	G K
		636.97	-7.346E-02	%	7.065E-01	2.02E-01	G
		284.29	9.517E-04	%	8.938E-01	2.63E-01	G
CS-134	3.0626E-02						
		604.66	5.777E-03	&(P	4.373E-02	1.26E-02	G K
		795.76	5.902E-02	(P	5.181E-02	1.72E-02	G
		569.29	9.034E-02	% P	2.743E-01	8.16E-02	G
		801.84	-8.765E-02	&	6.513E-01	1.89E-01	G
CS-137	1.6830E-02						
		661.62	1.683E-02	%(P	5.882E-02	1.74E-02	G
CE-139	-9.2398E-03						
		165.85	-9.240E-03	%(P	5.167E-02	1.55E-02	G
EU-152	-4.0167E-02						
		121.78	-4.017E-02	%(P	1.488E-01	4.47E-02	G K
		344.30	-9.738E-03	% P	1.296E-01	3.77E-02	G
		1408.08	6.792E-02	% P	1.984E-01	5.80E-02	G
		964.00	-4.791E-03	& P	7.004E-01	2.04E-01	G
		1112.07	2.665E-01	% P	3.529E-01	1.13E-01	G
		778.90	7.046E-02	& P	2.936E-01	8.52E-02	G
EU-154	2.1953E-03						
		123.10	2.195E-03	%(P	1.065E-01	3.17E-02	G K
		1274.80	-6.591E-03	& P	1.866E-01	5.25E-02	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          723.30-7.017E-02 & P 3.054E-01 8.99E-02 G
                         1004.80 3.421E-02 & P 2.949E-01 8.40E-02 G

EU-155       1.2501E-01
                           86.45 1.250E-01 %(  1.716E-01 5.25E-02 G K
                          105.31 3.409E-02 %   2.187E-01 6.56E-02 G

HG-203       2.0891E-02
                          279.17 2.089E-02 %(  4.832E-02 1.46E-02 G K
                           72.87-5.570E-01 & P 1.156E+00 3.50E-01 G
                           70.83 4.704E-01 %   2.078E+00 6.25E-01 G
                           82.50 1.146E+00 &   2.251E+00 6.84E-01 G

TL-208       3.3476E-01
                          583.14 3.348E-01 *(P 5.125E-02 2.70E-02 G
                          510.72 4.429E-01 + P 2.268E-01 9.41E-02 G

PB-212       7.7871E-01
                          238.63 7.688E-01  (P 1.096E-01 4.22E-02 G K
                                                          Energy duplication
                           77.11 8.031E-01  (  3.454E-01 1.11E-01 G
                           74.81 1.020E+00 & P 6.876E-01 2.15E-01 G

PB-214       4.5551E-01
                          351.99 4.555E-01  (P 9.734E-02 3.89E-02 G K
                          295.22 6.066E-01 + P 1.925E-01 6.87E-02 G
                                                          Energy duplication
                           77.11 1.301E+00 + P 5.657E-01 1.82E-01 G
                          241.92 8.342E-03 % P 7.799E-01 2.32E-01 G

BI-212       5.7930E-01
                          727.17 5.793E-01  (P 3.924E-01 1.49E-01 G K
                         1620.56 1.932E-01 %   1.677E+00 4.56E-01 G
                          785.42-1.514E-02 % P 2.832E+00 8.06E-01 G

BI-214       4.9186E-01
                          609.32 4.849E-01  (P 8.977E-02 4.38E-02 G K
                         1764.51 4.823E-01  (P 1.569E-01 9.63E-02 G
                         1120.28 5.232E-01  (P 3.399E-01 1.30E-01 G

RA-224       6.5826E-01
                          241.00 6.583E-01  (P 6.214E-01 1.98E-01 G

RA-226       1.2498E+00
                          185.99 1.250E+00  (  9.467E-01 3.02E-01 G

AC-228       9.8049E-01
                          911.07 9.995E-01 @(P 1.646E-01 8.79E-02 G K
                          968.90 1.282E+00 + P 3.835E-01 1.87E-01 G
                          338.40 9.346E-01 @(P 3.096E-01 1.25E-01 G
```

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments

TH-227      -1.6389E-01
                          236.00-1.639E-01 %(P 4.021E-01 1.21E-01 G K
                          256.25-2.399E-01 & P 5.770E-01 1.74E-01 G

PA-234      -1.5227E-03
                           98.44-1.523E-03 %(  1.801E-01 5.36E-02 G K
                          946.00 7.854E-04 &   2.779E-01 7.83E-02 G
                          131.28-6.089E-02 %   2.256E-01 6.79E-02 G
                           94.67-1.812E-01 %   3.344E-01 1.02E-01 G
                          883.24-8.866E-02 %   4.546E-01 1.32E-01 G
                          926.70 4.581E-02 %   3.629E-01 1.02E-01 G
                          569.26 1.378E-01 %   4.048E-01 1.21E-01 G

TH-234       1.2154E+00
                           63.29 7.292E-01 %(P 2.169E+00 6.53E-01 G K
                           92.80 1.848E+00 *(P 1.684E+00 5.21E-01 G
                           92.38-4.272E-02 & P 1.975E+00 5.87E-01 G

AM-241      -7.0070E-02
                           59.54-7.007E-02 &(P 2.908E-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	3.3808E-02	3.5178E-02	3.4674E-01	3.4674E-01	3.829E-01
K-40		1.7748E+01	1.7748E+01	1.8453E+00	2.1002E+00	
MN-54	#A	2.7519E-02	2.7706E-02	4.0219E-02	4.0250E-02	4.279E-02
CO-57	#B	-1.4344E-02	-1.4457E-02	4.5267E-02	4.5274E-02	4.973E-02
CO-60	#B	1.6945E-02	1.6963E-02	4.5985E-02	4.5995E-02	5.213E-02
Sr-85	#A	-3.2760E-03	-3.3849E-03	4.3346E-02	4.3347E-02	4.806E-02
Kr-85	#A	-9.9836E+01	-9.9838E+01	1.5558E+03	1.5558E+03	1.114E+03
Y-88	#B	-8.5855E-03	-8.7580E-03	4.3093E-02	4.3095E-02	5.091E-02
NB-94	#B	1.6047E-02	1.6047E-02	3.6333E-02	3.6344E-02	4.055E-02
Ag-108M	#B	-8.0788E-03	-8.0792E-03	5.3975E-02	5.3977E-02	6.182E-02
CD-109	#A	2.1389E-01	2.1490E-01	1.3255E+00	1.3256E+00	1.466E+00
SN-113	#B	-1.1704E-02	-1.1922E-02	5.5349E-02	5.5353E-02	6.134E-02
SB-125	#F	1.5252E-01	1.5284E-01	1.0562E-01	1.0598E-01	1.294E-01
I-131	#B	-1.3356E-02	-1.7386E-02	5.9790E-02	5.9798E-02	5.139E-02
CS-134	#B	3.0540E-02	3.0626E-02	2.6850E-02	2.6906E-02	4.361E-02
CS-137	#A	1.6826E-02	1.6830E-02	5.2164E-02	5.2172E-02	5.881E-02
CE-139	#A	-9.0984E-03	-9.2398E-03	4.7753E-02	4.7756E-02	5.088E-02
EU-152	#B	-4.0149E-02	-4.0167E-02	1.3977E-01	1.3979E-01	1.487E-01
EU-154	#B	2.1938E-03	2.1953E-03	9.5143E-02	9.5143E-02	1.064E-01
EU-155	#B	1.2486E-01	1.2501E-01	1.5741E-01	1.5757E-01	1.714E-01
HG-203	#B	1.9962E-02	2.0891E-02	4.3820E-02	4.3836E-02	4.617E-02
TL-208	#	3.3476E-01	3.3476E-01	8.1049E-02	8.3227E-02	
PB-212	#	7.7871E-01	7.7871E-01	1.2826E-01	1.3560E-01	1.096E-01
PB-214	#	4.5551E-01	4.5551E-01	1.1666E-01	1.1946E-01	9.734E-02
BI-212		5.7930E-01	5.7930E-01	4.4756E-01	4.4875E-01	
BI-214		4.9186E-01	4.9186E-01	1.3322E-01	1.3609E-01	
RA-224		6.5826E-01	6.5826E-01	5.9444E-01	5.9560E-01	6.214E-01
RA-226		1.2498E+00	1.2498E+00	9.0390E-01	9.0665E-01	
AC-228	#	9.8049E-01	9.8049E-01	2.3561E-01	2.4203E-01	
TH-227	#B	-1.6389E-01	-1.6389E-01	3.7143E-01	3.7154E-01	4.021E-01
PA-234	#B	-1.5227E-03	-1.5227E-03	1.6091E-01	1.6091E-01	1.801E-01
TH-234	#B	1.2154E+00	1.2154E+00	1.0278E+00	1.0300E+00	2.169E+00
AM-241	#A	-7.0069E-02	-7.0070E-02	2.7600E-01	2.7602E-01	2.908E-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) 2.2042925E+01 pCi/gm
Total Decayed Activity (270.6 to 1999.1 keV) 2.2042929E+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_29JUNE2006_0858.An1

Sample description
FSS-OOL-10-03-020-F

Spectrum Filename: C:\GammaVision\Spectra\101F_29JUNE2006_0858.An1

Acquisition information
Start time: 29-Jun-2006 08:59:47
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: 1.9640E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.9640E+03) =
5.0916E+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	26-Jun-2006 14:56:00
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: 0.2377

***** 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	199.	24.10	1.50	1.654E-02	74.81	9.600	8.616E-01	PB212
77.12	286.	16.61	1.50	1.720E-02	77.11	10.700	1.069E+00	PB214
					77.11	17.500	6.537E-01	PB212
77.12	290.	16.61	1.50	1.720E-02	77.11	10.700	1.069E+00	PB214
					77.11	17.500	6.622E-01	PB212
86.73	138.	22.03	1.01	1.914E-02	86.45	32.740	1.525E-01	EU155
					88.04	3.790	PBC<MDA	CD109
89.85	103.	26.94	1.02	1.956E-02				
93.32	161.	17.38	1.02	1.995E-02	92.38	2.570	2.023E+00	TH234
					92.80	3.000	1.783E+00	TH234
129.71	107.	34.25	1.12	2.109E-02				
129.71	107.	34.25	1.12	2.109E-02	131.28	20.000	1.743E-01	PA234
186.07	116.	25.88	1.27	1.858E-02	185.99	3.280	1.315E+00	RA226
210.05	82.	39.38	1.45	1.717E-02				
238.85	776.	4.33	1.12	1.557E-02	238.63	43.100	7.893E-01	PB212
241.80	96.	25.46	1.12	1.541E-02	241.00	3.900	PBC<MDA	RA224
					241.92	7.470	PBC<MDA	PB214
270.95	113.	24.62	1.22	1.397E-02				
277.97	65.	31.71	1.21	1.365E-02				
277.97	65.	31.71	1.21	1.365E-02	279.17	81.500	4.229E-02	HG203
295.47	169.	12.65	0.81	1.291E-02	295.22	19.200	4.627E-01	PB214
300.57	74.	28.71	1.12	1.271E-02				
338.43	151.	18.44	1.46	1.135E-02	338.40	12.010	7.522E-01	AC228
352.06	242.	9.55	1.05	1.092E-02	351.99	37.100	4.075E-01	PB214
463.52	53.	25.13	1.32	8.341E-03	463.51	10.000	4.293E-01	SB125
510.92	120.	16.13	1.34	7.588E-03	510.72	22.500	4.181E-01	TL208
583.42	276.	8.94	1.28	6.681E-03	583.14	86.000	3.275E-01	TL208

609.38	217.	9.45	1.08	6.412E-03	609.32	46.090	5.031E-01	BI214
726.81	88.	19.91	1.29	5.445E-03	727.17	11.800	9.376E-01	BI212
794.58	24.	40.66	1.50	5.016E-03	795.76	85.400	PBC<MDA	CS134
911.47	158.	10.79	1.68	4.445E-03	911.07	29.000	8.304E-01	AC228
967.71	116.	13.15	1.15	4.217E-03	968.90	17.460	1.080E+00	AC228

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
1120.66	62.	31.20	1.67	3.711E-03	1120.28	15.040	7.658E-01	BI214
1461.23	680.	3.96	1.98	2.942E-03	1460.75	10.700	1.480E+01	K40
1765.10	39.	17.20	1.43	2.481E-03	1764.51	15.920	6.856E-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	
179.27	89.86	335.	103.	0.052	80.82	1.016	PB-214	lD
419.78	210.05	380.	82.	0.041	118.15	1.450	NP-239	s
477.39	238.77	178.	776.	0.388	13.00	1.122	PB-212	D
483.30	241.72	253.	96.	0.048	76.37	1.124	PB-214	D
541.63	270.95	228.	113.	0.056	73.87	1.218	AC-228	s
600.89	300.57	155.	74.	0.037	86.14	1.124	PB-212	s
1021.78	510.92	142.	57.	0.028	97.97	1.338	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	149.08	74.76	1112.	199.	0.099	72.29	1.499
PB-214	153.79	77.11	1017.	286.	0.143	49.83	1.499D
PB-212	153.79	77.11	1013.	290.	0.145	49.83	1.499D
EU-155	173.62	87.02	1028.	146.	0.073	96.10	1.499s
CD-109	173.70	87.06	872.	150.	0.075	86.95	1.499s
TH-234	185.47	92.94	890.	153.	0.077	80.22	1.499
TH-234	185.59	93.01	812.	187.	0.094	65.83	1.499
PA-234	258.36	129.37	546.	103.	0.051	101.00	1.499s
RA-226	372.00	186.17	478.	110.	0.055	89.11	1.499
PB-212	477.40	238.85	425.	595.	0.298	18.93	1.499
RA-224	483.05	241.67	491.	86.	0.043	112.35	1.499s
HG-203	554.90	277.59	169.	58.	0.029	103.09	1.499s
PB-214	590.80	295.53	206.	165.	0.083	43.13	1.499
AC-228	676.65	338.43	198.	149.	0.075	55.33	1.464s
PB-214	703.97	352.09	98.	210.	0.105	28.46	1.499
SB-125	926.92	463.51	77.	47.	0.023	87.82	1.499D
TL-208	1021.71	510.89	82.	70.	0.035	51.71	1.499s
TL-208	1166.96	583.48	82.	235.	0.118	25.13	1.499
BI-214	1218.79	609.38	65.	216.	0.108	28.35	1.079s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
BI-212	1453.77	726.81	65.	88.	0.044	59.74	1.294s
CS-134	1589.38	794.58	39.	24.	0.012	121.98	1.502s
AC-228	1823.29	911.47	39.	156.	0.078	32.37	1.678s
AC-228	1935.84	967.71	39.	115.	0.058	39.44	1.145s
BI-214	2241.92	1120.66	78.	62.	0.031	93.60	1.673
K-40	2923.48	1461.23	11.	677.	0.339	11.87	1.982
BI-214	3531.64	1765.10	3.	39.	0.020	51.59	1.428s

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		-3.6902E-02					
			477.56	-3.690E-02	%(	3.782E-01 1.09E-01	G
K-40		1.4802E+01					
			1460.75	1.480E+01	(P	3.920E-01 5.88E-01	G
MN-54		-1.5200E-02					
			834.81	-1.520E-02	%(P	5.284E-02 1.55E-02	G
CO-57		4.2986E-03					
			122.07	4.299E-03	&(	4.805E-02 1.43E-02	G K
			136.43	-7.203E-02	%	3.594E-01 1.08E-01	G
CO-60		4.7504E-03					
			1332.51	4.750E-03	%(P	5.315E-02 1.47E-02	G K
			1173.23	4.387E-03	% P	6.523E-02 1.84E-02	G K
Sr-85		-2.1212E-02					
			514.00	-2.121E-02	%(	5.785E-02 1.74E-02	G
Kr-85		-5.0058E+02					
			513.99	-5.006E+02	%(P	1.302E+03 3.89E+02	G
Y-88		0.0000E+00					
			1836.01	0.000E+00	%(	1.081E-01 3.04E-02	G K
			898.02	1.712E-02	& P	4.964E-02 1.47E-02	G
NB-94		1.5577E-02					
			871.10	1.558E-02	&(P	4.078E-02 1.21E-02	G K
			702.50	1.507E-02	% P	3.930E-02 1.17E-02	G K

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
Ag-108M	1.5261E-02						
		722.95	1.526E-02	&(	5.119E-02	1.51E-02	G K
		614.37	-2.227E-02	% P	5.571E-02	1.67E-02	G
		433.93	7.013E-03	%	4.364E-02	1.28E-02	G
CD-109	1.4122E+00						
		88.04	1.412E+00	(P	1.324E+00	4.11E-01	G
SN-113	-1.7730E-02						
		391.71	-1.773E-02	%(	5.443E-02	1.62E-02	G K
		255.04	-4.674E-01	% P	1.849E+00	5.52E-01	G
SB-125	9.5273E-02						
		427.95	-3.282E-03	%(P	1.313E-01	3.77E-02	G K
		600.77	-2.964E-03	% P	1.992E-01	5.57E-02	G
		636.15	-2.840E-03	& P	4.788E-01	1.37E-01	G
							Energy duplication
		463.51	3.870E-01	(P	3.607E-01	1.17E-01	G
		176.29	-6.309E-02	& P	6.308E-01	1.87E-01	G
I-131	-1.0249E-02						
		364.48	-1.025E-02	%(	5.926E-02	1.75E-02	G K
		636.97	3.260E-03	&	7.179E-01	2.02E-01	G
		284.29	1.801E-02	&	8.010E-01	2.35E-01	G
CS-134	1.6177E-02						
		604.66	-3.994E-03	%(P	4.781E-02	1.37E-02	G K
		795.76	3.923E-02	*(P	5.109E-02	1.62E-02	G
		569.29	4.740E-02	& P	2.772E-01	8.06E-02	G
		801.84	8.320E-04	%	4.825E-01	1.33E-01	G
CS-137	-1.7020E-03						
		661.62	-1.702E-03	&(P	5.196E-02	1.46E-02	G
CE-139	4.6116E-04						
		165.85	4.612E-04	%(P	4.619E-02	1.37E-02	G
EU-152	1.4903E-02						
		121.78	1.490E-02	&(P	1.478E-01	4.41E-02	G K
		344.30	-9.829E-03	& P	1.497E-01	4.37E-02	G
		1408.08	-1.898E-03	& P	3.333E-01	9.21E-02	G
		964.00	-9.120E-02	% P	4.205E-01	1.22E-01	G
		1112.07	-6.419E-03	% P	4.088E-01	1.13E-01	G
		778.90	2.331E-02	& P	3.408E-01	9.61E-02	G
EU-154	8.4684E-03						
		123.10	8.468E-03	%(P	1.008E-01	3.00E-02	G K
		1274.80	5.279E-04	& P	1.535E-01	4.18E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
		723.30	-2.273E-02	& P	4.465E-01	1.31E-01	G
		1004.80	-1.955E-03	& P	2.787E-01	7.67E-02	G
EU-155	1.6140E-01						
		86.45	1.614E-01	(	1.676E-01	5.17E-02	G K
		105.31	5.961E-02	%	2.004E-01	6.03E-02	G
HG-203	3.7454E-02						
		279.17	3.745E-02	&(	4.094E-02	1.29E-02	G K
		72.87	-2.352E-01	% P	1.052E+00	3.16E-01	G
		70.83	4.300E-02	%	2.536E+00	7.59E-01	G
		82.50	-1.183E+00	%	2.657E+00	8.05E-01	G
TL-208	2.8147E-01						
		583.14	2.817E-01	(P	5.372E-02	2.38E-02	G
		510.72	2.805E-01	*(P	1.811E-01	5.95E-02	G
PB-212	6.2501E-01						
		238.63	6.099E-01	(P	1.012E-01	3.89E-02	G K
							Energy duplication
		77.11	6.622E-01	(	3.452E-01	1.10E-01	G
		74.81	8.616E-01	& P	6.852E-01	2.13E-01	G
PB-214	3.5629E-01						
		351.99	3.563E-01	(P	8.293E-02	3.41E-02	G K
		295.22	4.579E-01	+ P	1.931E-01	6.65E-02	G
							Energy duplication
		77.11	1.069E+00	+ P	5.656E-01	1.80E-01	G
		241.92	-1.760E-01	% P	7.034E-01	2.11E-01	G
BI-212	9.3763E-01						
		727.17	9.376E-01	*(P	4.330E-01	1.88E-01	G K
		1620.56	5.418E-01	%	6.876E-01	2.50E-01	G
		785.42	-1.627E-02	% P	2.761E+00	7.81E-01	G
BI-214	5.0306E-01						
		609.32	5.031E-01	@(P	9.371E-02	4.78E-02	G K
		1764.51	6.856E-01	+ P	1.790E-01	1.19E-01	G
		1120.28	7.658E-01	+ P	5.404E-01	2.40E-01	G
RA-224	9.8782E-01						
		241.00	9.878E-01	(P	1.210E+00	3.73E-01	G
RA-226	1.2408E+00						
		185.99	1.241E+00	(	1.181E+00	3.69E-01	G
AC-228	8.8902E-01						
		911.07	8.304E-01	*(P	1.705E-01	9.07E-02	G K
		968.90	1.080E+00	@(P	2.959E-01	1.43E-01	G
		338.40	7.522E-01	*(P	3.447E-01	1.41E-01	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments

TH-227      -1.2098E-01
                          236.00-1.210E-01 &(P 4.342E-01 1.30E-01 G K
                          256.25-8.627E-02 % P 5.913E-01 1.75E-01 G

PA-234       1.1808E-01
                           98.44 7.857E-02 %(  1.736E-01 5.26E-02 G K
                          946.00 3.550E-02 %   2.817E-01 8.07E-02 G
                          131.28 1.677E-01 *(  1.823E-01 5.64E-02 G
                           94.67-1.370E-01 %   3.199E-01 9.68E-02 G
                          883.24 7.251E-02 %   3.341E-01 9.59E-02 G
                          926.70 4.675E-02 %   4.331E-01 1.22E-01 G
                          569.26 7.468E-02 &   4.089E-01 1.19E-01 G

TH-234       1.0080E+00
                           63.29-5.756E-01 %(P 2.104E+00 6.28E-01 G K
                           92.80 2.161E+00  (P 1.562E+00 4.90E-01 G
                           92.38 2.065E+00  (P 1.912E+00 5.91E-01 G

AM-241       9.1243E-02
                           59.54 9.124E-02 %(P 2.741E-01 8.26E-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	-3.5606E-02	-3.6902E-02	3.2762E-01	3.2763E-01	3.649E-01
K-40		1.4802E+01	1.4802E+01	1.7632E+00	1.9515E+00	
MN-54	#A	-1.5107E-02	-1.5200E-02	5.0290E-02	5.0298E-02	5.252E-02
CO-57	#B	4.2683E-03	4.2986E-03	4.2979E-02	4.2980E-02	4.772E-02
CO-60	#B	4.7457E-03	4.7504E-03	4.4076E-02	4.4076E-02	5.309E-02
Sr-85	#A	-2.0597E-02	-2.1212E-02	5.2102E-02	5.2116E-02	5.618E-02
Kr-85	#A	-5.0057E+02	-5.0058E+02	1.2905E+03	1.2908E+03	1.301E+03
Y-88	#B	0.0000E+00	0.0000E+00	9.1158E-02	9.1158E-02	1.062E-01
NB-94	#B	1.5577E-02	1.5577E-02	3.6401E-02	3.6412E-02	4.078E-02
Ag-108M	#B	1.5261E-02	1.5261E-02	4.5336E-02	4.5344E-02	5.119E-02
CD-109	#	1.4062E+00	1.4122E+00	1.2317E+00	1.2342E+00	1.318E+00
SN-113	#B	-1.7438E-02	-1.7730E-02	4.8676E-02	4.8687E-02	5.354E-02
SB-125	#B	9.5094E-02	9.5273E-02	8.6256E-02	8.6424E-02	1.310E-01
I-131	#B	-8.0841E-03	-1.0249E-02	5.2351E-02	5.2355E-02	4.674E-02
CS-134	#B	1.6136E-02	1.6177E-02	2.0070E-02	2.0091E-02	4.769E-02
CS-137	#A	-1.7017E-03	-1.7020E-03	2.5895E-01	2.5895E-01	5.195E-02
CE-139	#A	4.5480E-04	4.6116E-04	4.0981E-02	4.0981E-02	4.556E-02
EU-152	#B	1.4897E-02	1.4903E-02	1.3239E-01	1.3239E-01	1.478E-01
EU-154	#B	8.4632E-03	8.4684E-03	9.0074E-02	9.0075E-02	1.007E-01
EU-155	#A	1.6123E-01	1.6140E-01	1.5511E-01	1.5536E-01	1.674E-01
HG-203	#A	3.5951E-02	3.7454E-02	3.8610E-02	3.8668E-02	3.929E-02
TL-208	#	2.8147E-01	2.8147E-01	7.1460E-02	7.3209E-02	5.372E-02
PB-212	#	6.2501E-01	6.2501E-01	1.1953E-01	1.2464E-01	1.012E-01
PB-214	#	3.5629E-01	3.5629E-01	1.0236E-01	1.0432E-01	8.293E-02
BI-212	#	9.3763E-01	9.3763E-01	5.6451E-01	5.6699E-01	
BI-214		5.0306E-01	5.0306E-01	1.4336E-01	1.4615E-01	
RA-224	#A	9.8782E-01	9.8782E-01	1.1190E+00	1.1204E+00	1.210E+00
RA-226	#	1.2408E+00	1.2408E+00	1.1057E+00	1.1080E+00	1.181E+00
AC-228	#	8.8902E-01	8.8902E-01	2.2569E-01	2.3121E-01	
TH-227	#B	-1.2098E-01	-1.2098E-01	4.0211E-01	4.0217E-01	4.342E-01
PA-234	#B	1.1808E-01	1.1808E-01	1.1926E-01	1.1944E-01	1.736E-01
TH-234	#B	1.0080E+00	1.0080E+00	6.8547E-01	6.8774E-01	2.104E+00
AM-241	#A	9.1242E-02	9.1243E-02	2.4770E-01	2.4775E-01	2.741E-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) 1.7131903E+01 pCi/gm
Total Decayed Activity (270.6 to 1999.1 keV) 1.7131903E+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_29JUNE2006_1432.An1

Sample description
FSS-OOL-10-03-016-F

Spectrum Filename: C:\GammaVision\Spectra\101F_29JUNE2006_1432.An1

Acquisition information
Start time: 29-Jun-2006 14:34:14
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: 1.6920E+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	26-Jun-2006 14:45:00
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. 14 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.3504

***** 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	206.	22.22	1.50	1.654E-02	70.83	3.520	3.230E+00	HG203
					74.81	9.600	1.036E+00	PB212
77.07	300.	15.09	1.50	1.720E-02	77.11	17.500	7.970E-01	PB212
					77.11	10.700	1.287E+00	PB214
77.07	297.	15.09	1.50	1.720E-02	77.11	17.500	7.871E-01	PB212
					77.11	10.700	1.287E+00	PB214
87.11	129.	22.02	1.01	1.916E-02				
90.19	88.	30.96	1.02	1.958E-02	88.04	3.790	PBC<MDA	CD109
93.20	125.	22.76	1.02	1.991E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
129.63	71.	41.38	0.87	2.109E-02				
186.86	142.	24.33	1.22	1.853E-02	185.99	3.280	1.858E+00	RA226
209.62	103.	27.54	1.17	1.720E-02				
238.84	802.	4.07	1.12	1.556E-02	238.63	43.100	9.474E-01	PB212
240.45	38.	29.65	1.50	1.545E-02	241.00	3.900	4.990E-01	RA224
					241.92	7.470	PBC<MDA	PB214
270.44	54.	32.92	1.08	1.399E-02				
295.42	172.	13.68	1.33	1.291E-02	295.22	19.200	5.464E-01	PB214
328.08	50.	38.83	1.33	1.169E-02				
338.61	201.	13.86	1.09	1.134E-02	338.40	12.010	1.166E+00	AC228
352.05	264.	9.94	0.96	1.092E-02	351.99	37.100	5.153E-01	PB214
463.13	46.	32.67	1.09	8.348E-03				
463.13	46.	32.67	1.09	8.348E-03	463.51	10.000	4.255E-01	SB125
511.49	146.	15.16	1.42	7.579E-03	510.72	22.500	6.055E-01	TL208
583.45	230.	8.67	1.17	6.681E-03	583.14	86.000	3.157E-01	TL208
609.66	199.	10.06	1.42	6.409E-03	609.32	46.090	5.345E-01	BI214
727.63	34.	33.57	1.50	5.443E-03	727.17	11.800	PBC<MDA	BI212

768.56	55.	30.56	1.52	5.176E-03				
911.65	169.	10.56	1.45	4.444E-03	911.07	29.000	1.034E+00	AC228
968.39	104.	17.18	1.56	4.214E-03	968.90	17.460	1.121E+00	AC228
1120.63	53.	30.93	1.95	3.711E-03	1120.28	15.040	7.515E-01	BI214
1461.44	628.	4.13	1.84	2.941E-03	1460.75	10.700	1.586E+01	K40
1765.76	24.	20.41	1.25	2.481E-03	1764.51	15.920	4.764E-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	
179.96	89.99	323.	88.	0.044	92.88	1.016	PB-214	lD
185.70	93.00	355.	113.	0.056	76.50	1.018	TH-234	D
418.92	209.62	291.	103.	0.051	82.63	1.173	NP-239	sM
477.37	238.83	133.	802.	0.401	12.22	1.122	PB-212	D
483.32	241.81	235.	125.	0.062	58.63	1.124	PB-214	lD
483.32	241.81	235.	125.	0.062	58.63	1.124	XE-138	D
540.61	270.44	131.	54.	0.027	98.76	1.081	AC-228	
655.94	328.08	139.	50.	0.025	116.50	1.333	AC-228	
1537.31	768.56	65.	55.	0.027	91.68	1.523	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
HG-203	146.46	73.45	1042.	-138.	-0.069	102.54	1.499s
PB-212	149.34	74.89	1000.	206.	0.103	66.65	1.499
PB-212	153.79	77.11	877.	300.	0.150	45.27	1.499D
PB-214	153.79	77.11	881.	297.	0.148	45.27	1.499D
TH-234	185.71	93.06	847.	123.	0.061	98.96	1.499
RA-226	372.23	186.29	499.	100.	0.050	99.59	1.499s
PB-212	477.31	238.81	370.	650.	0.325	17.02	1.499
RA-224	480.60	240.45	46.	38.	0.019	88.95	1.499
PB-214	590.97	295.61	179.	150.	0.075	44.38	1.499s
AC-228	677.00	338.61	177.	199.	0.100	41.59	1.090s
PB-214	704.13	352.17	108.	223.	0.112	27.86	1.499s
SB-125	926.37	463.24	74.	47.	0.023	86.76	1.499
TL-208	1022.93	511.49	114.	129.	0.065	45.49	1.419s
TL-208	1166.90	583.45	62.	227.	0.114	26.00	1.168
BI-214	1219.36	609.66	66.	198.	0.099	30.19	1.424s
BI-212	1455.41	727.63	51.	34.	0.017	100.71	1.499
AC-228	1823.65	911.65	41.	167.	0.083	31.68	1.453
AC-228	1937.20	968.39	56.	103.	0.052	51.55	1.559s
BI-214	2241.85	1120.63	55.	53.	0.026	92.80	1.953
K-40	2923.91	1461.44	11.	625.	0.313	12.38	1.837

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
BI-214	3532.96	1765.76	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	Peak MDA Value pCi/gm	Peak	COMMENTS
BE-7		0.0000E+00						
			477.56	0.000E+00	%(	5.688E-01	1.64E-01	G
K-40		1.5863E+01						
			1460.75	1.586E+01	(P	4.551E-01	6.58E-01	G
MN-54		-1.8262E-03						
			834.81	-1.826E-03	%(P	5.334E-02	1.48E-02	G
CO-57		-7.1168E-03						
			122.07	-7.117E-03	%(	5.589E-02	1.67E-02	G K
			136.43	-2.064E-02	%	4.277E-01	1.27E-01	G
CO-60		-4.5695E-03						
			1332.51	-4.569E-03	%(P	6.294E-02	1.73E-02	G K
			1173.23	-1.462E-02	% P	6.983E-02	2.01E-02	G K
Sr-85		-2.0129E-02						
			514.00	-2.013E-02	&(	6.986E-02	2.08E-02	G
Kr-85		-4.7904E+02						
			513.99	-4.790E+02	&(P	1.567E+03	4.66E+02	G
Y-88		-5.9590E-03						
			1836.01	-5.959E-03	%(	5.070E-02	1.34E-02	G K
			898.02	-8.292E-03	% P	5.888E-02	1.67E-02	G
NB-94		-5.2911E-03						
			871.10	-5.291E-03	%(P	4.702E-02	1.32E-02	G K
			702.50	-6.319E-05	% P	4.998E-02	1.40E-02	G K
Ag-108M		9.0416E-03						
			722.95	9.042E-03	%(	5.749E-02	1.66E-02	G K
			614.37	-1.355E-02	% P	6.301E-02	1.85E-02	G
			433.93	-1.467E-03	%	4.810E-02	1.38E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CD-109	5.6308E-03						
		88.04	5.631E-03	%(P	1.538E+00	4.58E-01	G
SN-113	8.9557E-03						
		391.71	8.956E-03	%(	6.599E-02	1.93E-02	G K
		255.04	2.223E-01	& P	1.950E+00	5.75E-01	G
SB-125	9.3722E-02						
		427.95	-2.601E-02	&(P	1.294E-01	3.77E-02	G K
		600.77	-2.536E-03	% P	2.056E-01	5.68E-02	G
		636.15	1.780E-01	% P	3.592E-01	1.09E-01	G
		463.51	4.481E-01	(P	4.115E-01	1.34E-01	G
		176.29	9.913E-02	% P	6.688E-01	1.99E-01	G
I-131	1.6316E-02						
		364.48	1.632E-02	%(	5.946E-02	1.76E-02	G K
		636.97	3.292E-01	%	7.387E-01	2.23E-01	G
		284.29	1.181E-02	%	9.233E-01	2.70E-01	G
CS-134	3.3738E-03						
		604.66	3.374E-03	%(P	4.381E-02	1.24E-02	G K
		795.76	3.286E-02	% P	6.294E-02	1.92E-02	G
		569.29	-3.374E-03	% P	3.475E-01	9.90E-02	G
		801.84	-1.703E-01	%	6.390E-01	1.87E-01	G
CS-137	6.2471E-03						
		661.62	6.247E-03	&(P	5.011E-02	1.42E-02	G
CE-139	6.1829E-03						
		165.85	6.183E-03	%(P	5.395E-02	1.60E-02	G
EU-152	-9.3863E-03						
		121.78	-9.386E-03	%(P	1.209E-01	3.58E-02	G K
		344.30	-1.804E-02	% P	1.589E-01	4.64E-02	G
		1408.08	-1.274E-02	& P	2.470E-01	6.53E-02	G
		964.00	-2.295E-03	% P	5.848E-01	1.66E-01	G
		1112.07	-9.767E-04	& P	4.350E-01	1.19E-01	G
		778.90	8.642E-02	% P	3.412E-01	9.90E-02	G
EU-154	-1.8289E-02						
		123.10	-1.829E-02	%(P	1.176E-01	3.51E-02	G K
		1274.80	5.028E-02	% P	1.721E-01	5.02E-02	G
		723.30	-1.059E-02	% P	4.332E-01	1.25E-01	G
		1004.80	-4.361E-02	% P	3.442E-01	9.77E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
EU-155	-5.5563E-02						
		86.45	-5.556E-02	%(	1.818E-01	5.48E-02	G K
		105.31	4.000E-02	&	2.152E-01	6.44E-02	G
HG-203	-1.8734E-03						
		279.17	-1.873E-03	&(	5.911E-02	1.74E-02	G K
		72.87	8.012E-03	% P	1.382E+00	4.12E-01	G
		70.83	-2.164E+00	&	2.402E+00	7.40E-01	G
		82.50	-4.307E-02	&	3.055E+00	9.11E-01	G
TL-208	3.1569E-01						
		583.14	3.157E-01	(P	5.465E-02	2.77E-02	G
		510.72	6.055E-01	+ P	2.449E-01	1.03E-01	G
PB-212	7.7987E-01						
		238.63	7.729E-01	(P	1.099E-01	4.43E-02	G K
							Energy duplication
		77.11	7.970E-01	(	3.734E-01	1.20E-01	G
		74.81	1.036E+00	& P	7.548E-01	2.36E-01	G
PB-214	4.5494E-01						
		351.99	4.400E-01	@(P	1.008E-01	4.12E-02	G K
		295.22	4.838E-01	@(P	2.093E-01	7.24E-02	G
							Energy duplication
		77.11	1.287E+00	+ P	6.119E-01	1.97E-01	G
		241.92	2.012E-01	% P	7.977E-01	2.39E-01	G
BI-212	4.2276E-01						
		727.17	4.228E-01	(P	4.479E-01	1.45E-01	G K
		1620.56	3.962E-02	&	1.521E+00	3.78E-01	G
		785.42	7.907E-01	% P	2.274E+00	6.72E-01	G
BI-214	5.1956E-01						
		609.32	5.345E-01	@(P	1.098E-01	5.41E-02	G K
		1764.51	4.764E-01	(P	1.490E-01	9.91E-02	G
		1120.28	7.515E-01	+ P	5.355E-01	2.34E-01	G
RA-224	4.9897E-01						
		241.00	4.990E-01	(P	4.558E-01	1.51E-01	G
RA-226	1.3075E+00						
		185.99	1.307E+00	*(	1.399E+00	4.34E-01	G
AC-228	1.0869E+00						
		911.07	1.034E+00	(P	2.017E-01	1.10E-01	G K
		968.90	1.121E+00	*(P	4.075E-01	1.94E-01	G
		338.40	1.166E+00	@(P	3.791E-01	1.64E-01	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments

TH-227      -1.5856E-01
                          236.00-1.586E-01 &(P 4.754E-01 1.43E-01 G K
                          256.25-5.630E-02 & P 5.687E-01 1.67E-01 G

PA-234      -1.0434E-01
                           98.44-1.043E-01 %(  1.754E-01 5.35E-02 G K
                          946.00-3.880E-02 &   3.286E-01 9.40E-02 G
                          131.28-5.566E-02 &   2.412E-01 7.24E-02 G
                           94.67-3.005E-02 %   3.572E-01 1.07E-01 G
                          883.24-4.232E-02 %   4.412E-01 1.24E-01 G
                          926.70-4.924E-02 %   4.405E-01 1.23E-01 G
                          569.26 0.000E+00 %   5.128E-01 1.46E-01 G

TH-234       1.3573E+00
                           63.29 1.137E+00 %(P 2.372E+00 7.17E-01 G K
                           92.80 1.644E+00 &(P 1.852E+00 5.70E-01 G
                           92.38 1.615E+00 & P 2.245E+00 6.85E-01 G

AM-241      -1.0741E-01
                           59.54-1.074E-01 &(P 3.309E-01 9.96E-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

- -

***** 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	4.9335E-01	4.9335E-01	5.472E-01
K-40		1.5863E+01	1.5863E+01	1.9717E+00	2.1659E+00	
MN-54	#A	-1.8141E-03	-1.8262E-03	9.9461E-02	9.9461E-02	5.299E-02
CO-57	#B	-7.0623E-03	-7.1168E-03	5.0074E-02	5.0076E-02	5.546E-02
CO-60	#B	-4.5646E-03	-4.5695E-03	5.7161E-02	5.7161E-02	6.287E-02
Sr-85	#A	-1.9495E-02	-2.0129E-02	6.2502E-02	6.2513E-02	6.766E-02
Kr-85	#A	-4.7903E+02	-4.7904E+02	1.5774E+03	1.5776E+03	1.567E+03
Y-88	#B	-5.8442E-03	-5.9590E-03	4.0068E-02	4.0070E-02	4.972E-02
NB-94	#B	-5.2911E-03	-5.2911E-03	4.3058E-02	4.3059E-02	4.702E-02
Ag-108M	#B	9.0412E-03	9.0416E-03	4.9701E-02	4.9704E-02	5.749E-02
CD-109	#A	5.6051E-03	5.6308E-03	1.3736E+00	1.3736E+00	1.531E+00
SN-113	#B	8.7957E-03	8.9557E-03	5.7805E-02	5.7807E-02	6.481E-02
SB-125	#B	9.3530E-02	9.3722E-02	8.3835E-02	8.4002E-02	1.291E-01
I-131	#B	1.2606E-02	1.6316E-02	5.2860E-02	5.2868E-02	4.594E-02
CS-134	#B	3.3645E-03	3.3738E-03	3.7150E-02	3.7151E-02	4.369E-02
CS-137	#A	6.2459E-03	6.2471E-03	4.2525E-02	4.2527E-02	5.010E-02
CE-139	#A	6.0903E-03	6.1829E-03	4.8139E-02	4.8140E-02	5.314E-02
EU-152	#B	-9.3821E-03	-9.3863E-03	1.3323E-01	1.3323E-01	1.209E-01
EU-154	#B	-1.8277E-02	-1.8289E-02	1.1574E-01	1.1575E-01	1.176E-01
EU-155	#B	-5.5499E-02	-5.5563E-02	1.6435E-01	1.6438E-01	1.816E-01
HG-203	#B	-1.7918E-03	-1.8734E-03	5.2082E-02	5.2082E-02	5.654E-02
TL-208		3.1569E-01	3.1569E-01	8.2933E-02	8.4830E-02	
PB-212	#	7.7987E-01	7.7987E-01	1.3399E-01	1.4105E-01	1.099E-01
PB-214	#	4.5494E-01	4.5494E-01	1.2050E-01	1.2321E-01	1.008E-01
BI-212	#A	4.2276E-01	4.2276E-01	4.3423E-01	4.3489E-01	4.479E-01
BI-214		5.1956E-01	5.1956E-01	1.5775E-01	1.6046E-01	
RA-224		4.9897E-01	4.9897E-01	4.5224E-01	4.5312E-01	4.558E-01
RA-226	#A	1.3074E+00	1.3075E+00	1.3021E+00	1.3042E+00	1.399E+00
AC-228		1.0869E+00	1.0869E+00	2.6843E-01	2.7537E-01	
TH-227	#B	-1.5856E-01	-1.5856E-01	4.3979E-01	4.3988E-01	4.754E-01
PA-234	#B	-1.0434E-01	-1.0434E-01	1.6047E-01	1.6057E-01	1.754E-01
TH-234	#B	1.3573E+00	1.3573E+00	1.4108E+00	1.4129E+00	2.372E+00
AM-241	#A	-1.0741E-01	-1.0741E-01	3.1187E-01	3.1193E-01	3.309E-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_29JUNE2006_1432.An1

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

Total Activity (270.1 to 1999.1 keV) 1.8283802E+01 pCi/gm
Total Decayed Activity (270.1 to 1999.1 keV) 1.8283802E+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_29JUNE2006_1518.An1

Sample description
FSS-OOL-10-03-007-F

Spectrum Filename: C:\GammaVision\Spectra\101F_29JUNE2006_1518.An1

Acquisition information

Start time:	29-Jun-2006 15:18:34
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:	1.9660E+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	26-Jun-2006 14:55:00
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: 0.3206

***** 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	202.	24.29	1.50	1.654E-02	70.83	3.520	2.733E+00	HG203
					74.81	9.600	8.761E-01	PB212
77.17	314.	15.44	1.50	1.720E-02	77.11	10.700	1.173E+00	PB214
					77.11	17.500	7.174E-01	PB212
77.17	318.	15.44	1.50	1.720E-02	77.11	10.700	1.173E+00	PB214
					77.11	17.500	7.259E-01	PB212
93.11	123.	35.65	1.50	1.989E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
93.12	116.	36.52	1.50	1.985E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
186.16	116.	30.17	1.41	1.857E-02	185.99	3.280	1.303E+00	RA226
238.84	783.	4.22	1.12	1.556E-02	238.63	43.100	7.950E-01	PB212
241.78	106.	20.99	1.12	1.540E-02	241.00	3.900	1.198E+00	RA224
270.41	93.	22.11	1.45	1.400E-02				
295.55	157.	19.22	1.20	1.291E-02	295.22	19.200	4.290E-01	PB214
300.51	47.	33.89	1.52	1.271E-02				
338.73	130.	18.47	0.87	1.134E-02	338.40	12.010	6.465E-01	AC228
352.11	271.	9.95	1.29	1.092E-02	351.99	37.100	4.562E-01	PB214
463.82	45.	29.23	1.00	8.336E-03	463.51	10.000	PBC<MDA	SB125
511.23	130.	15.76	1.36	7.583E-03	510.72	22.500	4.579E-01	TL208
583.40	230.	9.28	1.08	6.682E-03	583.14	86.000	2.723E-01	TL208
609.66	197.	9.56	1.52	6.409E-03	609.32	46.090	4.560E-01	BI214
727.59	58.	28.74	1.47	5.440E-03	727.17	11.800	6.113E-01	BI212
795.63	34.	29.63	1.10	5.017E-03				
795.63	34.	29.63	1.10	5.017E-03	795.76	85.400	5.404E-02	CS134
911.69	187.	9.14	1.44	4.444E-03	911.07	29.000	9.879E-01	AC228
969.47	122.	16.21	1.49	4.210E-03	968.90	17.460	1.134E+00	AC228

1120.61	65.	26.46	0.88	3.710E-03	1120.28	15.040	8.008E-01	BI214
1461.40	708.	3.78	1.86	2.941E-03	1460.75	10.700	1.541E+01	K40

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
1765.50	21.	21.82	1.30	2.481E-03	1764.51	15.920	3.578E-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	
477.38	238.91	153.	783.	0.391	12.65	1.122	PB-212	D
483.26	241.85	193.	106.	0.053	62.97	1.124	PB-214	D
540.55	270.41	156.	93.	0.046	66.32	1.447	AC-228	s
600.78	300.51	110.	47.	0.024	101.66	1.524	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
HG-203	146.39	73.41	1107.	-140.	-0.070	104.33	1.499s
PB-212	149.32	74.88	1173.	202.	0.101	72.86	1.499s
PB-214	153.79	77.11	1049.	314.	0.157	46.32	1.499D
PB-212	153.79	77.11	1046.	318.	0.159	46.32	1.499D
TH-234	185.83	93.12	1027.	116.	0.058	109.56	1.499s
TH-234	185.79	93.11	994.	123.	0.061	106.94	1.499s
RA-226	371.94	186.14	506.	112.	0.056	89.81	1.499s
PB-212	477.34	238.82	492.	586.	0.293	20.03	1.499
RA-224	481.83	241.06	38.	46.	0.023	70.53	1.499
PB-214	590.78	295.52	227.	145.	0.072	49.93	1.499
AC-228	677.25	338.73	169.	128.	0.064	55.42	0.869
PB-214	704.19	352.20	129.	241.	0.121	27.49	1.499s
SB-125	927.22	463.66	89.	35.	0.018	119.82	1.499s
TL-208	1022.40	511.23	106.	114.	0.057	47.28	1.364s
TL-208	1166.82	583.40	80.	228.	0.114	27.84	1.080
BI-214	1219.36	609.66	62.	196.	0.098	28.67	1.523
BI-212	1455.34	727.59	69.	57.	0.029	86.23	1.472
CS-134	1591.48	795.63	29.	25.	0.013	105.76	1.502
AC-228	1823.74	911.70	47.	190.	0.095	29.17	1.447
AC-228	1939.35	969.47	74.	121.	0.061	48.64	1.491
BI-214	2241.81	1120.61	62.	65.	0.033	79.38	0.882s
K-40	2923.82	1461.40	5.	706.	0.353	11.35	1.863
BI-214	3532.43	1765.50	0.	21.	0.010	65.47	1.299s

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	%(	4.448E-01 1.28E-01	G
K-40		1.5414E+01					
			1460.75	1.541E+01	(P	2.862E-01 5.85E-01	G
MN-54		1.2635E-02					
			834.81	1.264E-02	%(P	4.145E-02 1.21E-02	G
CO-57		1.8995E-02					
			122.07	1.899E-02	%(	4.881E-02 1.47E-02	G K
			136.43	-7.496E-03	%	3.924E-01 1.17E-01	G
CO-60		4.7843E-03					
			1332.51	4.784E-03	%(P	4.857E-02 1.33E-02	G K
			1173.23	8.365E-03	% P	6.253E-02 1.78E-02	G K
Sr-85		-8.7792E-03					
			514.00	-8.779E-03	%(	5.455E-02 1.60E-02	G
Kr-85		-2.2119E+02					
			513.99	-2.212E+02	%(P	1.224E+03 3.58E+02	G
Y-88		-3.5495E-03					
			1836.01	-3.549E-03	%(	3.754E-02 9.53E-03	G K
			898.02	1.263E-02	& P	6.047E-02 1.76E-02	G
NB-94		-7.3167E-03					
			871.10	-7.317E-03	%(P	4.407E-02 1.26E-02	G K
			702.50	2.039E-02	% P	4.156E-02 1.26E-02	G K
Ag-108M		-1.6165E-02					
			722.95	-1.616E-02	%(	6.203E-02 1.83E-02	G K
			614.37	-2.788E-02	& P	5.876E-02 1.78E-02	G
			433.93	5.794E-03	&	3.477E-02 1.01E-02	G
CD-109		-3.4559E-01					
			88.04	-3.456E-01	%(P	1.453E+00 4.37E-01	G
SN-113		-1.2276E-04					
			391.71	-1.228E-04	%(	5.655E-02 1.63E-02	G K
			255.04	-5.340E-01	% P	2.079E+00 6.22E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	1.1012E-01						
		427.95	4.963E-02	%(P	1.179E-01	3.55E-02	G K
		600.77	-1.879E-02	% P	2.075E-01	5.90E-02	G
		636.15	-4.240E-02	& P	4.551E-01	1.31E-01	G
		463.51	2.892E-01	@(P	3.860E-01	1.20E-01	G
		176.29	-9.778E-02	% P	6.628E-01	1.97E-01	G
I-131	-5.0975E-03						
		364.48	-5.098E-03	%(	6.096E-02	1.78E-02	G K
		636.97	-1.401E-01	%	8.988E-01	2.62E-01	G
		284.29	-5.222E-02	&	8.720E-01	2.57E-01	G
CS-134	1.8051E-02						
		604.66	-1.840E-03	&(P	8.189E-02	2.39E-02	G K
		795.76	4.078E-02	(P	4.459E-02	1.46E-02	G
		569.29	-1.740E-03	& P	3.048E-01	8.70E-02	G
		801.84	5.353E-02	%	3.325E-01	9.26E-02	G
CS-137	-1.0672E-02						
		661.62	-1.067E-02	&(P	6.417E-02	1.86E-02	G
CE-139	-4.5662E-03						
		165.85	-4.566E-03	&(P	5.182E-02	1.54E-02	G
EU-152	-8.7202E-04						
		121.78	-8.720E-04	%(P	1.426E-01	4.23E-02	G K
		344.30	-2.319E-02	& P	1.492E-01	4.39E-02	G
		1408.08	1.391E-03	% P	2.120E-01	5.55E-02	G
		964.00	2.477E-01	% P	4.773E-01	1.45E-01	G
		1112.07	8.181E-02	& P	2.864E-01	8.26E-02	G
		778.90	-1.012E-03	& P	4.735E-01	1.35E-01	G
EU-154	3.9730E-02						
		123.10	3.973E-02	%(P	9.977E-02	3.01E-02	G K
		1274.80	1.413E-02	& P	1.622E-01	4.53E-02	G
		723.30	-8.052E-02	% P	2.845E-01	8.39E-02	G
		1004.80	5.781E-02	& P	3.107E-01	8.95E-02	G
EU-155	9.2089E-02						
		86.45	9.209E-02	%(	1.726E-01	5.25E-02	G K
		105.31	1.891E-02	%	2.085E-01	6.23E-02	G
HG-203	-4.1916E-03						
		279.17	-4.192E-03	&(	5.269E-02	1.55E-02	G K
		72.87	-4.290E-01	& P	1.258E+00	3.79E-01	G
		70.83	-1.884E+00	+	2.131E+00	6.55E-01	G
		82.50	-4.372E-01	%	2.670E+00	8.01E-01	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments

TL-208       2.7229E-01
                          583.14 2.723E-01  (P 5.316E-02 2.55E-02 G
                          510.72 4.579E-01 + P 2.042E-01 8.24E-02 G

PB-212       6.0030E-01
                          238.63 6.003E-01  (P 1.087E-01 4.05E-02 G K
                                                          Energy duplication
                           77.11 7.259E-01 +   3.502E-01 1.12E-01 G
                           74.81 8.761E-01 + P 7.027E-01 2.18E-01 G

PB-214       4.0676E-01
                          351.99 4.095E-01 @(P 9.435E-02 3.78E-02 G K
                          295.22 4.016E-01  (P 2.018E-01 6.77E-02 G
                                                          Energy duplication
                           77.11 1.173E+00 + P 5.738E-01 1.83E-01 G
                          241.92-3.154E-01 % P 7.456E-01 2.25E-01 G

BI-212       6.1133E-01
                          727.17 6.113E-01  (P 4.429E-01 1.78E-01 G K
                         1620.56-8.117E-03 &   1.883E+00 4.95E-01 G
                          785.42 7.688E-01 % P 2.211E+00 6.55E-01 G

BI-214       4.5604E-01
                          609.32 4.560E-01  (P 9.157E-02 4.39E-02 G K
                         1764.51 3.578E-01 - P 1.282E-01 7.98E-02 G
                         1120.28 8.008E-01 + P 4.852E-01 2.13E-01 G

RA-224       5.2909E-01
                          241.00 5.291E-01  (P 3.606E-01 1.26E-01 G

RA-226       1.2630E+00
                          185.99 1.263E+00 *(  1.213E+00 3.78E-01 G

AC-228       1.0570E+00
                          911.07 1.010E+00  (P 1.856E-01 9.93E-02 G K
                          968.90 1.134E+00  (P 3.990E-01 1.85E-01 G
                          338.40 6.465E-01 - P 3.190E-01 1.22E-01 G

TH-227      -1.7434E-01
                          236.00-1.743E-01 &(P 4.768E-01 1.44E-01 G K
                          256.25-1.404E-01 % P 5.819E-01 1.73E-01 G

PA-234      -1.0394E-02
                           98.44-1.039E-02 &(  1.773E-01 5.28E-02 G K
                          946.00 4.384E-02 &   2.380E-01 6.83E-02 G
                          131.28-6.127E-02 %   2.276E-01 6.85E-02 G
                           94.67-1.023E-03 &   2.997E-01 8.91E-02 G
                          883.24-5.571E-02 %   4.024E-01 1.15E-01 G
                          926.70-1.208E-02 %   4.654E-01 1.30E-01 G
```

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 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26 1.161E-03 &   4.501E-01 1.29E-01 G

TH-234       1.0233E+00
                           63.29 3.659E-01 %(P 2.149E+00 6.42E-01 G K
                           92.80 1.411E+00 *(P 1.724E+00 5.28E-01 G
                           92.38 1.568E+00 *(P 2.049E+00 6.26E-01 G

AM-241      -2.3874E-02
                           59.54-2.387E-02 &(P 2.823E-01 8.41E-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	3.8379E-01	3.8379E-01	4.277E-01
K-40		1.5414E+01	1.5414E+01	1.7553E+00	1.9595E+00	
MN-54	#A	1.2551E-02	1.2635E-02	3.6393E-02	3.6400E-02	4.117E-02
CO-57	#B	1.8848E-02	1.8995E-02	4.4243E-02	4.4256E-02	4.844E-02
CO-60	#B	4.7791E-03	4.7843E-03	4.0031E-02	4.0032E-02	4.852E-02

Sr-85	#A	-8.5006E-03	-8.7792E-03	4.8111E-02	4.8114E-02	5.282E-02
Kr-85	#A	-2.2118E+02	-2.2119E+02	1.3487E+03	1.3487E+03	1.224E+03
Y-88	#B	-3.4805E-03	-3.5495E-03	2.8598E-02	2.8599E-02	3.681E-02
NB-94	#B	-7.3167E-03	-7.3167E-03	3.9770E-02	3.9772E-02	4.407E-02
Ag-108M	#B	-1.6164E-02	-1.6165E-02	5.4918E-02	5.4925E-02	6.202E-02
CD-109	#A	-3.4400E-01	-3.4559E-01	1.3444E+00	1.3446E+00	1.446E+00
SN-113	#B	-1.2055E-04	-1.2276E-04	4.8759E-02	4.8759E-02	5.553E-02
SB-125	#B	1.0989E-01	1.1012E-01	1.3661E-01	1.3676E-01	1.177E-01
I-131	#B	-3.9302E-03	-5.0975E-03	5.3385E-02	5.3385E-02	4.700E-02
CS-134	#B	1.8001E-02	1.8051E-02	1.9406E-02	1.9433E-02	8.166E-02
CS-137	#A	-1.0670E-02	-1.0672E-02	7.0107E-02	7.0110E-02	6.416E-02
CE-139	#A	-4.4973E-03	-4.5662E-03	4.9296E-02	4.9297E-02	5.104E-02
EU-152	#B	-8.7163E-04	-8.7202E-04	1.9918E-01	1.9918E-01	1.425E-01
EU-154	#B	3.9704E-02	3.9730E-02	9.0426E-02	9.0453E-02	9.970E-02
EU-155	#B	9.1983E-02	9.2089E-02	1.5738E-01	1.5746E-01	1.724E-01
HG-203	#B	-4.0076E-03	-4.1916E-03	4.6631E-02	4.6632E-02	5.037E-02
TL-208		2.7229E-01	2.7229E-01	7.6600E-02	7.8130E-02	
PB-212	#	6.0030E-01	6.0030E-01	1.2151E-01	1.2616E-01	1.087E-01
PB-214	#	4.0676E-01	4.0676E-01	1.1272E-01	1.1504E-01	9.435E-02
BI-212		6.1133E-01	6.1133E-01	5.3343E-01	5.3455E-01	
BI-214		4.5604E-01	4.5604E-01	1.3151E-01	1.3401E-01	
RA-224		5.2909E-01	5.2909E-01	3.7894E-01	3.8012E-01	3.606E-01
RA-226	#	1.2630E+00	1.2630E+00	1.1343E+00	1.1366E+00	1.213E+00
AC-228		1.0570E+00	1.0570E+00	3.0181E-01	3.0766E-01	
TH-227	#B	-1.7434E-01	-1.7434E-01	4.3996E-01	4.4007E-01	4.768E-01
PA-234	#B	-1.0394E-02	-1.0394E-02	1.5848E-01	1.5848E-01	1.773E-01
TH-234	#B	1.0233E+00	1.0233E+00	1.1495E+00	1.1509E+00	2.149E+00
AM-241	#A	-2.3874E-02	-2.3874E-02	2.9762E-01	2.9763E-01	2.823E-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) 1.8339426E+01 pCi/gm
Total Decayed Activity (270.1 to 1999.1 keV) 1.8339426E+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: 102_10JUN2006_1525.An1

Sample description
OOL-10-03-002-C RC

Spectrum Filename: C:\GammaVision\Spectra\102_10JUN2006_1525.An1

Acquisition information
Start time: 10-Jun-2006 15:25:57
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: 1.7180E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.7180E+03) =
5.8207E+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	10-Jun-2006 13:00:00
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. 10 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.6703

***** 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
77.11	146.	26.55	1.50	9.541E-03	77.11	10.700	1.122E+00	PB214
					77.11	17.500	6.863E-01	PB212
77.11	146.	26.55	1.50	9.541E-03	77.11	10.700	1.122E+00	PB214
					77.11	17.500	6.863E-01	PB212
186.00	99.	28.65	1.54	1.627E-02	185.99	3.280	1.400E+00	RA226
239.31	527.	6.62	1.44	1.377E-02	238.63	43.100	6.967E-01	PB212
295.62	98.	20.74	1.31	1.145E-02	295.22	19.200	3.520E-01	PB214
328.57	58.	31.48	1.00	1.035E-02				
339.24	92.	22.33	1.20	1.004E-02	338.40	12.010	5.990E-01	AC228
352.33	192.	10.04	1.39	9.669E-03	351.99	37.100	4.191E-01	PB214
511.92	80.	17.52	1.56	6.680E-03	510.72	22.500	4.188E-01	TL208
584.08	126.	13.60	1.59	5.881E-03	583.14	86.000	1.957E-01	TL208
610.34	136.	10.87	1.03	5.640E-03	609.32	46.090	4.109E-01	BI214
795.63	18.	40.39	1.60	4.420E-03	795.76	85.400	PBC<MDA	CS134
912.55	104.	12.28	2.17	3.916E-03	911.07	29.000	7.149E-01	AC228
970.13	68.	20.20	0.81	3.714E-03	968.90	17.460	8.260E-01	AC228
1462.88	437.	4.78	2.25	2.617E-03	1460.75	10.700	1.225E+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
656.81	328.57	102.	58.	0.029	83.72	0.995	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	153.80	77.11	675.	146.	0.073	79.66	1.500D
PB-212	153.80	77.11	675.	146.	0.073	79.66	1.500D
RA-226	372.22	186.30	315.	81.	0.040	93.84	1.500s
PB-212	477.57	238.97	291.	395.	0.198	23.74	1.500
PB-214	590.95	295.65	153.	89.	0.044	67.31	1.500
AC-228	677.34	338.83	109.	64.	0.032	78.62	1.500s
PB-214	704.53	352.42	63.	178.	0.089	29.30	1.500s
TL-208	1023.61	511.92	38.	80.	0.040	52.55	1.564s
TL-208	1168.00	584.08	55.	126.	0.063	40.81	1.586
BI-214	1220.54	610.34	33.	136.	0.068	32.61	1.033
CS-134	1591.28	795.63	19.	18.	0.009	121.17	1.601s
AC-228	1825.31	912.58	18.	99.	0.050	35.04	1.679s
AC-228	1940.90	970.35	29.	45.	0.023	67.43	1.718s
K-40	2926.82	1462.96	6.	420.	0.210	14.84	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		1.3893E-02					
			477.56	1.389E-02	%(	3.782E-01	1.07E-01 G
K-40		1.1779E+01					
			1460.75	1.178E+01	(P	4.001E-01	5.83E-01 G
MN-54		-4.0626E-04					
			834.81	-4.063E-04	%(P	6.438E-02	1.80E-02 G
CO-57		-5.5036E-04					
			122.07	-5.504E-04	%(	4.935E-02	1.45E-02 G K
			136.43	-6.677E-02	%	4.371E-01	1.30E-01 G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CO-60	1.2477E-02						
		1332.51	1.248E-02	%(P	6.360E-02	1.80E-02	G K
		1173.23	6.252E-03	&	7.085E-02	1.98E-02	G K
Sr-85	0.0000E+00						
		514.00	0.000E+00	%(	4.241E-02	1.19E-02	G
Kr-85	0.0000E+00						
		513.99	0.000E+00	%(	9.779E+02	2.74E+02	G
Y-88	-2.4200E-05						
		1836.01	-2.420E-05	%(P	2.718E-02	3.69E-03	G K
		898.02	-3.966E-03	& P	5.814E-02	1.59E-02	G
NB-94	-6.0856E-03						
		871.10	-6.086E-03	%(	5.618E-02	1.58E-02	G K
		702.50	-7.626E-04	%	5.142E-02	1.43E-02	G K
Ag-108M	-4.1663E-03						
		722.95	-4.166E-03	%(	4.935E-02	1.38E-02	G K
		614.37	-1.401E-02	% P	6.387E-02	1.87E-02	G
		433.93	8.282E-03	%	4.004E-02	1.16E-02	G
CD-109	4.4050E-01						
		88.04	4.405E-01	%(P	2.282E+00	6.84E-01	G
SN-113	-4.4582E-03						
		391.71	-4.458E-03	&(	6.414E-02	1.85E-02	G K
		255.04	-3.304E-01	%	1.964E+00	5.81E-01	G
SB-125	3.1359E-02						
		427.95	3.136E-02	%(P	1.289E-01	3.76E-02	G K
		600.77	-1.033E-03	& P	2.287E-01	6.32E-02	G
		636.15	9.983E-02	% P	3.848E-01	1.12E-01	G
		463.51	2.500E-01	% P	4.161E-01	1.28E-01	G
		176.29	7.473E-02	% P	6.258E-01	1.85E-01	G
I-131	3.5775E-03						
		364.48	3.577E-03	%(	4.895E-02	1.41E-02	G K
		636.97	1.580E-01	%	6.047E-01	1.76E-01	G
		284.29	0.000E+00	%	7.712E-01	2.25E-01	G
CS-134	1.9555E-02						
		604.66	2.989E-03	%(	4.565E-02	1.29E-02	G K
		795.76	3.849E-02	(	4.751E-02	1.55E-02	G
		569.29	4.418E-03	&	1.970E-01	5.32E-02	G
		801.84	-2.761E-02	% P	5.362E-01	1.48E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CS-137	0.0000E+00						
		661.62	0.000E+00	%(	6.569E-02	1.85E-02	G
CE-139	2.1737E-02						
		165.85	2.174E-02	&(P	5.053E-02	1.53E-02	G
EU-152	-1.6806E-03						
		121.78	-1.681E-03	%(P	1.476E-01	4.34E-02	G K
		344.30	2.876E-02	%	1.377E-01	4.04E-02	G
		1408.08	-4.093E-02	%	2.913E-01	8.07E-02	G
		964.00	-3.678E-03	% P	4.447E-01	1.23E-01	G
		1112.07	1.086E-01	&	4.542E-01	1.31E-01	G
		778.90	-4.704E-02	% P	3.651E-01	1.03E-01	G
EU-154	1.4207E-02						
		123.10	1.421E-02	%(P	1.128E-01	3.35E-02	G K
		1274.80	-1.595E-02	&	1.994E-01	5.54E-02	G
		723.30	-4.276E-02	% P	2.587E-01	7.38E-02	G
		1004.80	-5.134E-02	%	3.558E-01	1.01E-01	G
EU-155	1.1902E-01						
		86.45	1.190E-01	%(P	2.739E-01	8.28E-02	G K
		105.31	-1.003E-02	%	2.654E-01	7.88E-02	G
HG-203	-1.5824E-02						
		279.17	-1.582E-02	&(P	4.920E-02	1.47E-02	G K
		72.87	-6.092E-01	&	2.101E+00	6.33E-01	G
		70.83	1.126E+00	%	3.507E+00	1.06E+00	G
		82.50	-4.371E-01	%	4.120E+00	1.23E+00	G
TL-208	1.9565E-01						
		583.14	1.957E-01	(P	5.788E-02	2.67E-02	G
		510.72	4.188E-01	+	1.638E-01	7.35E-02	G
PB-212	5.2237E-01						
		238.63	5.224E-01	(	1.087E-01	4.13E-02	G K
							Energy duplication
		77.11	6.863E-01	+	5.833E-01	1.82E-01	G
		74.81	5.504E-01	& P	1.217E+00	3.68E-01	G
PB-214	3.8987E-01						
		351.99	3.899E-01	@(P	8.692E-02	3.82E-02	G K
		295.22	3.163E-01	-	2.156E-01	7.10E-02	G
							Energy duplication
		77.11	1.122E+00	+	9.539E-01	2.98E-01	G
		241.92	2.109E-01	%	7.245E-01	2.17E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
BI-212	1.0025E-01						
		727.17	1.002E-01	%(	4.221E-01	1.22E-01	G K
		1620.56	4.487E-01	% P	1.552E+00	4.33E-01	G
		785.42	1.319E-01	% P	2.426E+00	6.72E-01	G
BI-214	4.1085E-01						
		609.32	4.109E-01	(	8.906E-02	4.47E-02	G K
		1764.51	-6.713E-02	& P	5.163E-01	1.43E-01	G
		1120.28	0.000E+00	&	6.325E-01	1.79E-01	G
RA-224	6.4409E-01						
		241.00	6.441E-01	&(P	1.216E+00	3.69E-01	G
RA-226	1.1871E+00						
		185.99	1.187E+00	(P	1.260E+00	3.92E-01	G
AC-228	6.3314E-01						
		911.07	6.857E-01	(P	1.551E-01	8.03E-02	G K
		968.90	5.459E-01	(P	3.361E-01	1.23E-01	G
		338.40	4.178E-01	-	3.349E-01	1.09E-01	G
TH-227	-2.3861E-01						
		236.00	-2.386E-01	%(P	4.705E-01	1.43E-01	G K
		256.25	-1.228E-01	%	5.927E-01	1.76E-01	G
PA-234	1.1822E-03						
		98.44	1.182E-03	%(	2.235E-01	6.61E-02	G K
		946.00	2.675E-02	%	2.458E-01	6.81E-02	G
		131.28	-1.548E-02	&	2.335E-01	6.92E-02	G
		94.67	-1.696E-01	%	4.936E-01	1.49E-01	G
		883.24	-4.557E-02	&	5.008E-01	1.41E-01	G
		926.70	-7.761E-02	%	5.180E-01	1.47E-01	G
		569.26	1.920E-02	&	2.648E-01	7.17E-02	G
TH-234	1.3933E+00						
		63.29	1.393E+00	%(P	4.273E+00	1.29E+00	G K
		92.80	1.425E+00	%	2.526E+00	7.69E-01	G
		92.38	1.693E+00	% P	2.899E+00	8.83E-01	G
AM-241	-6.5038E-02						
		59.54	-6.504E-02	%(	6.434E-01	1.91E-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	1.3874E-02	1.3893E-02	3.2000E-01	3.2000E-01	3.777E-01
K-40		1.1779E+01	1.1779E+01	1.7492E+00	1.8699E+00	4.001E-01
MN-54	#A	-4.0617E-04	-4.0626E-04	4.3882E+00	4.3882E+00	6.437E-02
CO-57	#B	-5.5022E-04	-5.5036E-04	4.3614E-02	4.3614E-02	4.934E-02
CO-60	#B	1.2476E-02	1.2477E-02	5.3974E-02	5.3979E-02	6.360E-02
Sr-85	#A	0.0000E+00	0.0000E+00	3.5666E-02	3.5666E-02	4.236E-02
Kr-85	#A	0.0000E+00	0.0000E+00	8.2248E+02	8.2249E+02	9.779E+02
Y-88	#B	-2.4184E-05	-2.4200E-05	1.4520E-04	1.4521E-04	2.716E-02
NB-94	#B	-6.0856E-03	-6.0856E-03	4.7517E-02	4.7518E-02	5.618E-02
Ag-108M	#B	-4.1663E-03	-4.1663E-03	4.1305E-02	4.1306E-02	4.935E-02
CD-109	#A	4.4043E-01	4.4050E-01	2.0514E+00	2.0515E+00	2.281E+00
SN-113	#B	-4.4554E-03	-4.4582E-03	5.5429E-02	5.5430E-02	6.410E-02
SB-125	#B	3.1356E-02	3.1359E-02	1.1287E-01	1.1289E-01	1.288E-01
I-131	#B	3.5463E-03	3.5775E-03	4.2386E-02	4.2387E-02	4.852E-02
CS-134	#B	1.9553E-02	1.9555E-02	2.3694E-02	2.3719E-02	4.565E-02
CS-137	#A	0.0000E+00	0.0000E+00	5.5418E-02	5.5418E-02	6.569E-02
CE-139	#A	2.1726E-02	2.1737E-02	4.5811E-02	4.5827E-02	5.050E-02
EU-152	#B	-1.6806E-03	-1.6806E-03	1.4498E+00	1.4498E+00	1.476E-01
EU-154	#B	1.4207E-02	1.4207E-02	1.0056E-01	1.0056E-01	1.128E-01
EU-155	#B	1.1902E-01	1.1902E-01	2.4853E-01	2.4861E-01	2.739E-01

HG-203 #B	-1.5801E-02	-1.5824E-02	4.4523E-02	4.4532E-02	4.912E-02

TL-208	1.9565E-01	1.9565E-01	8.0103E-02	8.0852E-02	
PB-212 #	5.2237E-01	5.2237E-01	1.2401E-01	1.2742E-01	1.087E-01
PB-214 #	3.8987E-01	3.8987E-01	1.1448E-01	1.1655E-01	8.692E-02
BI-212 #B	1.0025E-01	1.0025E-01	3.6748E-01	3.6752E-01	4.221E-01
BI-214	4.1085E-01	4.1085E-01	1.3397E-01	1.3593E-01	
RA-224 #A	6.4409E-01	6.4409E-01	1.1085E+00	1.1090E+00	1.216E+00
RA-226 #A	1.1871E+00	1.1871E+00	1.1757E+00	1.1775E+00	1.260E+00
AC-228 #	6.3314E-01	6.3314E-01	2.2236E-01	2.2518E-01	1.551E-01
TH-227 #B	-2.3861E-01	-2.3861E-01	4.3374E-01	4.3395E-01	4.705E-01
PA-234 #B	1.1822E-03	1.1822E-03	1.9817E-01	1.9817E-01	2.235E-01
TH-234 #B	1.3933E+00	1.3933E+00	3.8552E+00	3.8560E+00	4.273E+00
AM-241 #A	-6.5038E-02	-6.5038E-02	5.7355E-01	5.7356E-01	6.434E-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) 1.2385254E+01 pCi/gm
Total Decayed Activity (50.2 to 1999.0 keV) 1.2385254E+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: 102_10JUN2006_1601.An1

Sample description
OOL-10-03-003-C RC

Spectrum Filename: C:\GammaVision\Spectra\102_10JUN2006_1601.An1

Acquisition information
Start time: 10-Jun-2006 16:01:59
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: 1.6470E+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%
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-Jun-2006 13:00:00
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. 11 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.6092

***** 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	99.	40.77	1.50	8.847E-03				
74.97	99.	40.77	1.50	8.847E-03	74.81	9.600	PBC<MDA	PB212
77.36	129.	32.33	1.50	9.541E-03	77.11	10.700	PBC<MDA	PB214
					77.11	17.500	6.327E-01	PB212
77.36	129.	32.33	1.50	9.541E-03	77.11	10.700	1.035E+00	PB214
					77.11	17.500	6.327E-01	PB212
92.22	130.	30.03	1.52	1.322E-02				
92.22	130.	30.03	1.52	1.322E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	2.667E+00	TH234
185.59	120.	25.43	1.80	1.628E-02				
185.59	120.	25.43	1.80	1.628E-02	185.99	3.280	1.783E+00	RA226
209.55	74.	35.34	1.16	1.518E-02				
239.00	526.	5.24	1.22	1.379E-02	238.63	43.100	7.250E-01	PB212
242.14	97.	19.88	1.22	1.364E-02	241.00	3.900	1.467E+00	RA224
					241.92	7.470	7.775E-01	PB214
270.95	65.	29.67	0.92	1.240E-02				
295.36	144.	15.03	1.03	1.146E-02	295.22	19.200	5.378E-01	PB214
328.27	53.	31.49	0.85	1.036E-02				
338.80	137.	16.17	1.31	1.005E-02	338.40	12.010	9.304E-01	AC228
352.30	177.	14.47	1.21	9.670E-03	351.99	37.100	4.045E-01	PB214
463.58	35.	35.36	1.50	7.365E-03	463.51	10.000	PBC<MDA	SB125
511.79	115.	16.61	1.65	6.681E-03	510.72	22.500	6.269E-01	TL208
583.77	178.	11.51	1.15	5.884E-03	583.14	86.000	2.883E-01	TL208
610.27	130.	13.41	1.52	5.641E-03	609.32	46.090	4.097E-01	BI214
728.55	64.	26.70	0.67	4.786E-03	727.17	11.800	9.283E-01	BI212
912.36	146.	11.32	1.69	3.917E-03	911.07	29.000	1.052E+00	AC228
969.24	110.	14.37	2.08	3.718E-03	968.90	17.460	1.390E+00	AC228

1462.96	440.	4.91	2.03	2.617E-03			
1767.24	14.	36.02	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
184.02	92.22	574.	137.	0.069	78.39	1.520	PB-214 s
418.71	209.55	248.	74.	0.037	106.03	1.160	AC-228
477.63	239.00	117.	526.	0.263	15.73	1.215	PB-212 D
483.91	242.14	136.	97.	0.048	59.65	1.217	PB-214 D
541.54	270.95	134.	65.	0.033	89.01	0.923	AC-228 s
656.21	328.27	92.	53.	0.026	94.47	0.850	RH-106M s
2926.83	1462.96	3.	443.	0.221	14.37	2.033	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	802.	129.	0.064	97.00	1.500D
PB-212	153.80	77.11	802.	129.	0.064	97.00	1.500D
RA-226	372.34	186.37	326.	74.	0.037	102.38	1.500s
PB-212	477.62	238.99	352.	453.	0.226	22.54	1.500s
RA-224	484.02	242.19	308.	80.	0.040	96.91	1.500
PB-214	484.24	242.31	370.	69.	0.034	123.90	1.500
PB-214	591.06	295.70	128.	127.	0.063	46.31	1.500s
AC-228	677.27	338.80	118.	137.	0.068	48.52	1.306
PB-214	704.58	352.45	105.	149.	0.074	38.17	1.500
SB-125	926.90	463.58	66.	35.	0.017	106.09	1.500s
TL-208	1023.36	511.79	76.	115.	0.058	49.83	1.645s
TL-208	1167.38	583.77	68.	178.	0.089	34.53	1.151
BI-214	1220.40	610.27	58.	130.	0.065	40.24	1.524
BI-212	1457.05	728.55	57.	64.	0.032	80.10	0.674s
AC-228	1824.87	912.36	31.	146.	0.073	33.96	1.691
AC-228	1938.68	969.24	40.	110.	0.055	43.12	2.083s
BI-214	3535.95	1767.24	6.	14.	0.007	108.06	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		1.2898E-01					
			477.56	1.290E-01	%(	3.755E-01 1.11E-01	G
K-40		-8.9294E-02					
			1460.75	-8.929E-02	%(P	4.852E-01 1.32E-01	G
MN-54		-9.6158E-03					
			834.81	-9.616E-03	%(P	6.337E-02 1.81E-02	G
CO-57		6.4379E-04					
			122.07	6.438E-04	&(	4.510E-02 1.32E-02	G K
			136.43	-9.909E-02	&	4.854E-01 1.45E-01	G
CO-60		1.7460E-02					
			1332.51	1.746E-02	&(P	5.999E-02 1.73E-02	G K
			1173.23	-5.639E-03	&	8.306E-02 2.34E-02	G K
Sr-85		-1.0998E-02					
			514.00	-1.100E-02	%(	6.117E-02 1.79E-02	G
Kr-85		-2.5664E+02					
			513.99	-2.566E+02	%(	1.410E+03 4.13E+02	G
Y-88		1.0355E-02					
			1836.01	1.036E-02	%(P	4.155E-02 1.14E-02	G K
			898.02	1.387E-02	% P	6.088E-02 1.75E-02	G
NB-94		2.1762E-02					
			871.10	2.176E-02	%(	4.421E-02 1.35E-02	G K
			702.50	6.350E-03	&	5.201E-02 1.48E-02	G K
Ag-108M		-4.8182E-03					
			722.95	-4.818E-03	%(	5.044E-02 1.41E-02	G K
			614.37	-4.023E-02	& P	7.342E-02 2.24E-02	G
			433.93	1.203E-02	%	4.413E-02 1.30E-02	G
CD-109		-8.2042E-02					
			88.04	-8.204E-02	%(P	2.429E+00 7.23E-01	G
SN-113		0.0000E+00					
			391.71	0.000E+00	&(	7.288E-02 2.09E-02	G K
			255.04	7.018E-01	%	2.123E+00 6.36E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	1.1756E-01						
		427.95	2.629E-02	%(P	1.197E-01	3.46E-02	G K
		600.77	-3.684E-03	% P	2.521E-01	7.01E-02	G
		636.15	-2.603E-02	% P	4.119E-01	1.15E-01	G
		463.51	3.877E-01	*(P	4.520E-01	1.43E-01	G
		176.29	9.141E-03	& P	6.846E-01	2.01E-01	G
I-131	-3.2409E-03						
		364.48	-3.241E-03	%(	5.206E-02	1.50E-02	G K
		636.97	-6.833E-02	%	6.658E-01	1.89E-01	G
		284.29	8.024E-02	%	7.439E-01	2.18E-01	G
CS-134	8.4901E-03						
		604.66	8.490E-03	%(	4.088E-02	1.17E-02	G K
		795.76	3.709E-02	&	6.617E-02	2.04E-02	G
		569.29	3.417E-02	&	3.165E-01	9.05E-02	G
		801.84	2.285E-01	% P	6.062E-01	1.80E-01	G
CS-137	-5.2390E-03						
		661.62	-5.239E-03	&(	6.686E-02	1.90E-02	G
CE-139	9.4704E-05						
		165.85	9.470E-05	&(P	5.125E-02	1.51E-02	G
EU-152	-3.4458E-03						
		121.78	-3.446E-03	&(P	1.730E-01	5.11E-02	G K
		344.30	-3.846E-02	%	1.789E-01	5.29E-02	G
		1408.08	-8.717E-03	%	2.571E-01	6.72E-02	G
		964.00	-3.467E-03	& P	6.285E-01	1.78E-01	G
		1112.07	-2.293E-02	%	4.709E-01	1.30E-01	G
		778.90	-2.183E-03	& P	3.629E-01	9.85E-02	G
EU-154	-1.6961E-02						
		123.10	-1.696E-02	%(P	1.076E-01	3.20E-02	G K
		1274.80	4.677E-02	&	2.151E-01	6.19E-02	G
		723.30	-2.638E-02	% P	2.346E-01	6.55E-02	G
		1004.80	-7.024E-02	&	4.009E-01	1.15E-01	G
EU-155	6.8814E-02						
		86.45	6.881E-02	%(P	2.798E-01	8.40E-02	G K
		105.31	7.441E-02	&	2.688E-01	8.07E-02	G
HG-203	2.6931E-02						
		279.17	2.693E-02	&(P	4.876E-02	1.49E-02	G K
		72.87	-4.607E-01	%	2.256E+00	6.77E-01	G
		70.83	2.892E-01	%	3.055E+00	9.07E-01	G
		82.50	-5.832E-02	&	3.930E+00	1.17E+00	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	2.8831E-01						
		583.14	2.883E-01	(P	6.664E-02	3.33E-02	G
		510.72	6.269E-01	+	2.359E-01	1.04E-01	G
PB-212	6.2668E-01						
		238.63	6.242E-01	@(	1.243E-01	4.69E-02	G K
							Energy duplication
		77.11	6.327E-01	(	6.619E-01	2.05E-01	G
		74.81	9.567E-01	& P	1.313E+00	4.02E-01	G
PB-214	3.3943E-01						
		351.99	3.394E-01	(P	1.155E-01	4.33E-02	G K
		295.22	4.717E-01	+	2.063E-01	7.28E-02	G
							Energy duplication
		77.11	1.035E+00	+	1.083E+00	3.35E-01	G
		241.92	5.540E-01	+	7.429E-01	2.29E-01	G
BI-212	9.2826E-01						
		727.17	9.283E-01	(	5.496E-01	2.48E-01	G K
		1620.56	-4.177E-02	% P	2.043E+00	5.07E-01	G
		785.42	-3.263E-03	% P	3.240E+00	9.08E-01	G
BI-214	3.8808E-01						
		609.32	4.097E-01	(	1.204E-01	5.50E-02	G K
		1764.51	3.256E-01	?(P	3.270E-01	1.18E-01	G
		1120.28	2.945E-01	%	4.566E-01	1.43E-01	G
RA-224	1.2357E+00						
		241.00	1.236E+00	&(P	1.298E+00	4.05E-01	G
RA-226	1.1420E+00						
		185.99	1.142E+00	(P	1.336E+00	4.13E-01	G
AC-228	1.1787E+00						
		911.07	1.052E+00	(P	2.074E-01	1.19E-01	G K
		968.90	1.390E+00	*(P	4.069E-01	2.00E-01	G
		338.40	9.304E-01	-	3.622E-01	1.51E-01	G
TH-227	3.9064E-03						
		236.00	3.906E-03	%(P	5.141E-01	1.52E-01	G K
		256.25	-7.543E-02	%	7.057E-01	2.08E-01	G
PA-234	-4.3107E-02						
		98.44	-4.311E-02	%(	2.620E-01	7.83E-02	G K
		946.00	-2.035E-03	%	2.716E-01	7.37E-02	G
		131.28	-5.567E-02	&	2.648E-01	7.92E-02	G
		94.67	-1.166E-01	%	5.207E-01	1.56E-01	G
		883.24	5.858E-02	%	3.155E-01	8.76E-02	G
		926.70	-1.050E-02	&	4.952E-01	1.35E-01	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26 5.067E-02 &   4.696E-01 1.34E-01 G

TH-234      -1.1001E+00
                           63.29-1.100E+00 &(P 5.373E+00 1.61E+00 G K
                           92.80 1.938E+00 %   2.657E+00 8.14E-01 G
                           92.38-1.822E-01 % P 3.209E+00 9.55E-01 G

AM-241       1.7784E-01
                           59.54 1.778E-01 %(  7.449E-01 2.23E-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	1.2877E-01	1.2898E-01	3.3435E-01	3.3442E-01	3.749E-01
K-40	#A	-8.9294E-02	-8.9294E-02	4.3697E-01	4.3700E-01	4.852E-01
MN-54	#A	-9.6131E-03	-9.6158E-03	5.9156E-02	5.9158E-02	6.336E-02
CO-57	#B	6.4358E-04	6.4379E-04	3.9692E-02	3.9692E-02	4.508E-02
CO-60	#B	1.7459E-02	1.7460E-02	5.1988E-02	5.1998E-02	5.999E-02

Sr-85	#A	-1.0983E-02	-1.0998E-02	5.3775E-02	5.3779E-02	6.108E-02
Kr-85	#A	-2.5664E+02	-2.5664E+02	1.2404E+03	1.2405E+03	1.410E+03
Y-88	#B	1.0347E-02	1.0355E-02	3.4069E-02	3.4074E-02	4.152E-02
NB-94	#B	2.1762E-02	2.1762E-02	4.0490E-02	4.0508E-02	4.421E-02
Ag-108M	#B	-4.8182E-03	-4.8182E-03	4.2259E-02	4.2260E-02	5.044E-02
CD-109	#A	-8.2026E-02	-8.2042E-02	4.1842E+00	4.1842E+00	2.428E+00
SN-113	#B	0.0000E+00	0.0000E+00	6.2722E-02	6.2722E-02	7.282E-02
SB-125	#B	1.1755E-01	1.1756E-01	1.3027E-01	1.3044E-01	1.197E-01
I-131	#B	-3.2058E-03	-3.2409E-03	4.5059E-02	4.5059E-02	5.150E-02
CS-134	#B	8.4891E-03	8.4901E-03	3.5215E-02	3.5218E-02	4.088E-02
CS-137	#A	-5.2390E-03	-5.2390E-03	5.7066E-02	5.7067E-02	6.686E-02
CE-139	#A	9.4644E-05	9.4704E-05	4.5163E-02	4.5163E-02	5.122E-02
EU-152	#B	-3.4458E-03	-3.4458E-03	3.7998E-01	3.7998E-01	1.730E-01
EU-154	#B	-1.6961E-02	-1.6961E-02	9.8753E-02	9.8758E-02	1.076E-01
EU-155	#B	6.8811E-02	6.8814E-02	2.5189E-01	2.5192E-01	2.798E-01
HG-203	#B	2.6881E-02	2.6931E-02	4.4649E-02	4.4675E-02	4.866E-02
TL-208		2.8831E-01	2.8831E-01	9.9797E-02	1.0110E-01	
PB-212	#	6.2668E-01	6.2668E-01	1.4128E-01	1.4559E-01	1.243E-01
PB-214	#	3.3943E-01	3.3943E-01	1.2989E-01	1.3128E-01	1.155E-01
BI-212		9.2826E-01	9.2826E-01	7.4354E-01	7.4536E-01	
BI-214		3.8808E-01	3.8808E-01	1.5615E-01	1.5766E-01	
RA-224	#A	1.2357E+00	1.2357E+00	1.2149E+00	1.2168E+00	1.298E+00
RA-226	#A	1.1420E+00	1.1420E+00	1.2394E+00	1.2411E+00	1.336E+00
AC-228		1.1787E+00	1.1787E+00	3.2375E-01	3.3043E-01	
TH-227	#B	3.9064E-03	3.9064E-03	4.5521E-01	4.5521E-01	5.141E-01
PA-234	#B	-4.3107E-02	-4.3107E-02	2.3482E-01	2.3483E-01	2.620E-01
TH-234	#B	-1.1001E+00	-1.1001E+00	4.9559E+00	4.9563E+00	5.373E+00
AM-241	#A	1.7784E-01	1.7784E-01	6.6997E-01	6.7004E-01	7.449E-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) 2.7833948E+00 pCi/gm
Total Decayed Activity (270.7 to 1999.0 keV) 2.7833948E+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_6JULY2006_0812.An1

Sample description
FSS-OOL-10-03-011-F

Spectrum Filename: C:\GammaVision\Spectra\102F_6JULY2006_0812.An1

Acquisition information
Start time: 06-Jul-2006 08:12:36
Live time: 2000
Real time: 2022
Dead time: 1.07 %
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: 2.0310E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 2.0310E+03) =
4.9237E+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	26-Jun-2006 15:51:00
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: 0.5651

***** 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
75.04	160.	28.49	1.50	8.847E-03	74.81	9.600	1.254E+00	PB212
77.12	217.	21.14	1.50	9.541E-03	77.11	10.700	1.416E+00	PB214
					77.11	17.500	8.659E-01	PB212
77.12	217.	21.14	1.50	9.541E-03	77.11	10.700	1.416E+00	PB214
					77.11	17.500	8.659E-01	PB212
127.91	121.	32.65	1.28	1.711E-02				
186.43	126.	25.93	1.53	1.625E-02	185.99	3.280	1.509E+00	RA226
238.97	751.	4.47	1.21	1.379E-02	238.63	43.100	8.398E-01	PB212
242.46	94.	24.56	1.22	1.363E-02	241.00	3.900	PBC<MDA	RA224
					241.92	7.470	6.147E-01	PB214
270.60	76.	23.90	1.37	1.241E-02				
295.64	114.	14.13	1.25	1.145E-02	295.22	19.200	3.460E-01	PB214
300.74	60.	23.99	1.26	1.127E-02				
328.63	65.	38.41	1.28	1.035E-02				
338.78	200.	11.94	1.17	1.005E-02	338.40	12.010	1.103E+00	AC228
352.43	236.	10.75	1.36	9.667E-03	351.99	37.100	4.370E-01	PB214
463.35	79.	27.27	0.98	7.367E-03				
463.35	79.	27.27	0.98	7.367E-03	463.51	10.000	7.044E-01	SB125
511.17	134.	17.51	1.49	6.689E-03	510.72	22.500	5.910E-01	TL208
584.02	258.	8.77	1.46	5.881E-03	583.14	86.000	3.385E-01	TL208
610.14	139.	12.85	1.37	5.642E-03	609.32	46.090	3.552E-01	BI214
795.87	30.	33.84	1.60	4.420E-03	795.76	85.400	PBC<MDA	CS134
912.26	178.	10.45	2.11	3.917E-03	911.07	29.000	1.043E+00	AC228
969.83	108.	16.58	1.64	3.715E-03	968.90	17.460	1.107E+00	AC228
1121.51	66.	28.80	2.66	3.283E-03	1120.28	15.040	8.853E-01	BI214
1462.43	601.	4.10	1.94	2.618E-03	1460.75	10.700	1.425E+01	K40
1766.55	40.	15.81	1.72	2.223E-03	1764.51	15.920	7.496E-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	
255.41	127.91	528.	169.	0.084	62.31	1.280	AC-228	s
477.57	238.95	187.	751.	0.375	13.40	1.215	PB-212	D
484.55	242.45	221.	94.	0.047	73.69	1.217	XE-138	D
540.84	270.60	127.	76.	0.038	71.71	1.370	AC-228	
600.97	300.66	93.	62.	0.031	76.20	1.462	PB-212	
656.94	328.63	194.	65.	0.033	115.23	1.281	LA-140	
1456.37	728.21	30.	40.	0.020	77.22	1.304	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	149.66	75.04	1002.	160.	0.080	85.48	1.500s
PB-214	153.80	77.11	946.	217.	0.109	63.42	1.500D
PB-212	153.80	77.11	946.	217.	0.109	63.42	1.500D
RA-226	372.16	186.28	472.	102.	0.051	90.85	1.500s
PB-212	477.58	238.98	458.	680.	0.340	17.63	1.500s
PB-214	591.00	295.67	152.	106.	0.053	57.33	1.500
AC-228	677.24	338.78	138.	200.	0.100	35.82	1.175
PB-214	704.62	352.47	123.	236.	0.118	27.82	1.500
SB-125	927.12	463.68	79.	49.	0.025	84.54	1.500
TL-208	1022.11	511.17	109.	134.	0.067	52.52	1.486s
TL-208	1167.88	584.02	82.	258.	0.129	26.30	1.460
BI-214	1220.14	610.14	60.	139.	0.069	38.55	1.371
CS-134	1591.75	795.87	36.	30.	0.015	101.53	1.601s
AC-228	1824.66	912.26	44.	178.	0.089	31.36	2.109s
AC-228	1939.87	969.83	56.	108.	0.054	49.75	1.639
BI-214	2243.43	1121.51	71.	66.	0.033	86.40	2.656s
K-40	2925.76	1462.43	2.	601.	0.300	12.31	1.943
BI-214	3534.33	1766.43	3.	25.	0.012	65.86	2.237

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		9.5854E-02					
			477.56	9.585E-02	&(	4.101E-01 1.20E-01	G
K-40		1.4252E+01					
			1460.75	1.425E+01	(P	2.338E-01 5.85E-01	G
MN-54		-6.1030E-03					
			834.81	-6.103E-03	%(P	5.793E-02 1.65E-02	G
CO-57		1.5028E-03					
			122.07	1.503E-03	%(	5.795E-02 1.72E-02	G K
			136.43	-6.813E-02	&	4.741E-01 1.42E-01	G
CO-60		-5.2585E-05					
			1332.51	-5.259E-05	%(P	6.684E-02 1.83E-02	G K
			1173.23	-9.010E-03	%	7.827E-02 2.24E-02	G K
Sr-85		-8.9969E-03					
			514.00	-8.997E-03	&(	5.954E-02 1.74E-02	G
Kr-85		-1.6711E+02					
			513.99	-1.671E+02	&(	1.235E+03 3.61E+02	G
Y-88		-2.1786E-05					
			1836.01	-2.179E-05	%(P	2.447E-02 3.32E-03	G K
			898.02	-1.826E-03	& P	5.324E-02 1.45E-02	G
NB-94		6.9640E-03					
			871.10	6.964E-03	%(	4.654E-02 1.32E-02	G K
			702.50	-1.106E-02	%	5.019E-02 1.46E-02	G K
Ag-108M		7.1892E-03					
			722.95	7.189E-03	%(	5.319E-02 1.53E-02	G K
			614.37	-3.267E-02	% P	6.216E-02 1.89E-02	G
			433.93	-1.179E-02	%	4.287E-02 1.27E-02	G
CD-109		-1.1117E-01					
			88.04	-1.112E-01	&(P	1.916E+00 5.70E-01	G
SN-113		-5.2981E-04					
			391.71	-5.298E-04	&(	7.018E-02 2.03E-02	G K
			255.04	-3.598E-01	%	2.141E+00 6.36E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	8.8195E-02						
		427.95	-3.406E-02	&(P	1.392E-01	4.08E-02	G K
		600.77	2.839E-02	% P	2.486E-01	7.14E-02	G
		636.15	9.456E-02	% P	4.358E-01	1.27E-01	G
		463.51	4.501E-01	(P	4.024E-01	1.31E-01	G
		176.29	1.130E-01	& P	6.797E-01	2.03E-01	G
I-131	1.4093E-02						
		364.48	1.409E-02	%(	1.102E-01	3.22E-02	G K
		636.97	1.807E-01	&	1.595E+00	4.60E-01	G
		284.29	0.000E+00	%	1.725E+00	5.06E-01	G
CS-134	2.4850E-02						
		604.66	-2.252E-06	&(	4.826E-02	1.37E-02	G K
		795.76	5.325E-02	(	5.480E-02	1.80E-02	G
		569.29	-7.310E-02	%	3.471E-01	1.02E-01	G
		801.84	-9.643E-02	% P	6.036E-01	1.74E-01	G
CS-137	8.3354E-03						
		661.62	8.335E-03	&(	4.507E-02	1.29E-02	G
CE-139	-1.2461E-02						
		165.85	-1.246E-02	%(P	5.190E-02	1.55E-02	G
EU-152	-2.9908E-03						
		121.78	-2.991E-03	%(P	1.676E-01	4.98E-02	G K
		344.30	-6.186E-02	%	1.619E-01	4.87E-02	G
		1408.08	4.091E-02	%	2.236E-01	6.22E-02	G
		964.00	2.567E-01	& P	4.283E-01	1.32E-01	G
		1112.07	-2.906E-03	%	4.952E-01	1.38E-01	G
		778.90	-7.903E-02	& P	4.160E-01	1.21E-01	G
EU-154	-4.6703E-04						
		123.10	-4.670E-04	%(P	1.171E-01	3.47E-02	G K
		1274.80	-4.705E-03	&	1.830E-01	5.06E-02	G
		723.30	6.163E-03	% P	4.178E-01	1.21E-01	G
		1004.80	-7.657E-03	%	3.116E-01	8.64E-02	G
EU-155	-1.1928E-02						
		86.45	-1.193E-02	%(P	2.804E-01	8.36E-02	G K
		105.31	5.157E-02	%	2.677E-01	8.02E-02	G
HG-203	1.3439E-02						
		279.17	1.344E-02	%(P	4.989E-02	1.49E-02	G K
		72.87	-5.573E-01	%	2.396E+00	7.21E-01	G
		70.83	-1.916E-03	%	3.951E+00	1.18E+00	G
		82.50	-2.371E+00	%	4.547E+00	1.38E+00	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	3.3849E-01						
		583.14	3.385E-01	(P	5.909E-02	2.98E-02	G
		510.72	5.910E-01	+	2.271E-01	1.04E-01	G
PB-212	7.9054E-01						
		238.63	7.600E-01	@(	1.146E-01	4.47E-02	G K
							Energy duplication
		77.11	8.659E-01	*(	5.821E-01	1.83E-01	G
		74.81	1.254E+00	& P	1.177E+00	3.64E-01	G
PB-214	4.3818E-01						
		351.99	4.382E-01	(P	1.009E-01	4.07E-02	G K
		295.22	3.200E-01	-	1.817E-01	6.12E-02	G
							Energy duplication
		77.11	1.416E+00	+	9.520E-01	2.99E-01	G
		241.92	1.977E-01	%	7.480E-01	2.25E-01	G
BI-212	7.5384E-03						
		727.17	7.538E-03	%(	4.195E-01	1.18E-01	G K
		1620.56	-3.045E-01	% P	2.170E+00	5.93E-01	G
		785.42	-4.257E-01	% P	2.449E+00	7.05E-01	G
BI-214	3.8339E-01						
		609.32	3.552E-01	(	9.917E-02	4.57E-02	G K
		1764.51	4.650E-01	(P	1.904E-01	1.02E-01	G
		1120.28	8.853E-01	+	5.667E-01	2.55E-01	G
RA-224	4.2861E-01						
		241.00	4.286E-01	&(P	1.393E+00	4.19E-01	G
RA-226	1.2735E+00						
		185.99	1.273E+00	(P	1.296E+00	4.03E-01	G
AC-228	1.0743E+00						
		911.07	1.043E+00	(P	1.961E-01	1.09E-01	G K
		968.90	1.107E+00	(P	3.853E-01	1.84E-01	G
		338.40	1.103E+00	(	3.161E-01	1.32E-01	G
TH-227	-2.0463E-01						
		236.00	-2.046E-01	%(P	4.546E-01	1.38E-01	G K
		256.25	1.600E-02	%	6.277E-01	1.85E-01	G
PA-234	-8.9245E-02						
		98.44	-8.925E-02	&(	2.579E-01	7.78E-02	G K
		946.00	4.019E-02	&	2.700E-01	7.71E-02	G
		131.28	-1.071E-01	%	2.563E-01	7.75E-02	G
		94.67	1.486E-03	%	4.789E-01	1.43E-01	G
		883.24	9.859E-02	&	3.925E-01	1.14E-01	G
		926.70	1.203E-03	%	5.018E-01	1.39E-01	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26-1.075E-01 %   5.103E-01 1.50E-01 G

TH-234       1.0390E+00
                           63.29 1.039E+00 %(P 4.742E+00 1.42E+00 G K
                           92.80 1.556E+00 %   2.482E+00 7.57E-01 G
                           92.38 1.187E+00 % P 3.012E+00 9.11E-01 G

AM-241      -1.0671E-01
                           59.54-1.067E-01 &(  6.681E-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	

\- -

***** 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	8.4534E-02	9.5854E-02	3.6058E-01	3.6062E-01	3.617E-01
K-40		1.4252E+01	1.4252E+01	1.7549E+00	1.9286E+00	
MN-54	#A	-5.9732E-03	-6.1030E-03	5.5414E-02	5.5415E-02	5.670E-02
CO-57	#B	1.4659E-03	1.5028E-03	5.1653E-02	5.1653E-02	5.653E-02
CO-60	#B	-5.2402E-05	-5.2585E-05	9.9246E-02	9.9246E-02	6.661E-02

Sr-85	#A	-8.1123E-03	-8.9969E-03	5.2323E-02	5.2326E-02	5.369E-02
Kr-85	#A	-1.6709E+02	-1.6711E+02	1.0834E+03	1.0835E+03	1.235E+03
Y-88	#B	-2.0457E-05	-2.1786E-05	1.3072E-04	1.3072E-04	2.297E-02
NB-94	#B	6.9640E-03	6.9640E-03	3.9654E-02	3.9656E-02	4.654E-02
Ag-108M	#B	7.1881E-03	7.1892E-03	4.5757E-02	4.5759E-02	5.319E-02
CD-109	#A	-1.0953E-01	-1.1117E-01	2.5278E+00	2.5278E+00	1.888E+00
SN-113	#B	-4.9980E-04	-5.2981E-04	6.0828E-02	6.0828E-02	6.620E-02
SB-125	#B	8.7612E-02	8.8195E-02	7.6888E-02	7.7047E-02	1.383E-01
I-131	#B	6.1165E-03	1.4093E-02	9.6688E-02	9.6691E-02	4.783E-02
CS-134	#B	2.4629E-02	2.4850E-02	2.5230E-02	2.5268E-02	4.783E-02
CS-137	#A	8.3303E-03	8.3354E-03	3.8808E-02	3.8810E-02	4.505E-02
CE-139	#A	-1.1867E-02	-1.2461E-02	4.8277E-02	4.8282E-02	4.942E-02
EU-152	#B	-2.9865E-03	-2.9908E-03	3.4624E-01	3.4624E-01	1.674E-01
EU-154	#B	-4.6602E-04	-4.6703E-04	2.6104E-01	2.6104E-01	1.169E-01
EU-155	#B	-1.1884E-02	-1.1928E-02	8.5033E-01	8.5033E-01	2.793E-01
HG-203	#B	1.1637E-02	1.3439E-02	4.4563E-02	4.4569E-02	4.320E-02
TL-208		3.3849E-01	3.3849E-01	8.9166E-02	9.1167E-02	
PB-212	#	7.9054E-01	7.9054E-01	1.3940E-01	1.4629E-01	1.146E-01
PB-214	#	4.3818E-01	4.3818E-01	1.2211E-01	1.2457E-01	1.009E-01
BI-212	#B	7.5384E-03	7.5384E-03	3.5406E-01	3.5406E-01	4.195E-01
BI-214		3.8339E-01	3.8339E-01	1.4667E-01	1.4824E-01	
RA-224	#A	4.2861E-01	4.2861E-01	1.2559E+00	1.2562E+00	1.393E+00
RA-226	#A	1.2735E+00	1.2735E+00	1.2075E+00	1.2096E+00	1.296E+00
AC-228		1.0743E+00	1.0743E+00	2.4670E-01	2.5396E-01	
TH-227	#B	-2.0463E-01	-2.0463E-01	4.1773E-01	4.1789E-01	4.546E-01
PA-234	#B	-8.9245E-02	-8.9245E-02	2.3342E-01	2.3347E-01	2.579E-01
TH-234	#B	1.0390E+00	1.0390E+00	4.2691E+00	4.2695E+00	4.742E+00
AM-241	#A	-1.0671E-01	-1.0671E-01	5.9949E-01	5.9952E-01	6.681E-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 (1766.3 to 1999.0 keV) 1.6047930E+01 pCi/gm
Total Decayed Activity (1766.3 to 1999.0 keV) 1.6047930E+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_6JULY2006_1112.An1

Sample description
FSS-OOL-10-03-032-F-B

Spectrum Filename: C:\GammaVision\Spectra\102F_6JULY2006_1112.An1

Acquisition information
Start time: 06-Jul-2006 11:12:51
Live time: 2000
Real time: 2023
Dead time: 1.14 %
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: 2.2910E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 2.2910E+03) =
4.3649E+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	26-Jun-2006 16:24:00
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: 0.6364

***** 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	122.	40.69	1.50	8.847E-03				
74.88	122.	40.69	1.50	8.847E-03	74.81	9.600	PBC<MDA	PB212
77.13	217.	22.42	1.50	9.541E-03	77.11	10.700	1.254E+00	PB214
					77.11	17.500	7.669E-01	PB212
77.13	217.	22.42	1.50	9.541E-03	77.11	10.700	1.254E+00	PB214
					77.11	17.500	7.669E-01	PB212
174.26	97.	34.11	1.08	1.674E-02				
174.26	97.	34.11	1.08	1.674E-02	176.29	6.300	PBC<MDA	SB125
186.28	117.	29.02	1.26	1.625E-02	185.99	3.280	1.240E+00	RA226
208.92	108.	35.76	1.47	1.521E-02				
239.04	790.	4.21	1.22	1.379E-02	238.63	43.100	7.831E-01	PB212
242.36	93.	23.11	1.22	1.364E-02	241.00	3.900	PBC<MDA	RA224
					241.92	7.470	5.362E-01	PB214
271.00	115.	25.89	1.31	1.240E-02				
295.53	142.	17.35	1.23	1.145E-02	295.22	19.200	3.792E-01	PB214
329.60	85.	25.42	1.19	1.032E-02				
338.73	176.	12.69	1.32	1.005E-02	338.40	12.010	8.593E-01	AC228
352.41	279.	10.71	1.08	9.667E-03	351.99	37.100	4.570E-01	PB214
511.04	137.	16.56	1.44	6.691E-03	510.72	22.500	5.349E-01	TL208
583.98	263.	7.70	1.35	5.882E-03	583.14	86.000	3.056E-01	TL208
610.00	200.	10.14	1.43	5.643E-03	609.32	46.090	4.531E-01	BI214
728.15	51.	31.16	1.00	4.788E-03	727.17	11.800	5.318E-01	BI212
912.52	183.	10.56	1.62	3.916E-03	911.07	29.000	9.463E-01	AC228
966.02	30.	30.60	1.72	3.728E-03	964.00	14.580	PBC<MDA	EU152
970.47	86.	13.91	1.72	3.713E-03	968.90	17.460	7.828E-01	AC228
1122.02	39.	25.79	2.47	3.283E-03	1120.28	15.040	4.707E-01	BI214
1462.77	614.	4.12	2.36	2.618E-03	1460.75	10.700	1.291E+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
348.12	174.26	399.	97.	0.049	102.32	1.079	SB-125 l
417.46	208.92	479.	108.	0.054	107.27	1.475	AC-228 s
477.71	239.01	157.	790.	0.395	12.62	1.215	PB-212 D
484.35	242.33	183.	93.	0.046	69.34	1.217	XE-138 D
541.65	271.00	266.	115.	0.058	77.67	1.313	AC-228 s
658.87	329.60	141.	85.	0.042	76.27	1.194	TH-227 s
1932.05	965.92	28.	29.	0.015	93.98	1.716	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-214	153.80	77.11	1076.	217.	0.109	67.27	1.500D
PB-212	153.80	77.11	1076.	217.	0.109	67.27	1.500D
RA-226	372.35	186.37	550.	114.	0.057	88.18	1.500
PB-212	477.71	239.04	456.	684.	0.342	17.51	1.500
PB-214	591.13	295.74	227.	124.	0.062	58.01	1.500s
AC-228	677.14	338.73	129.	176.	0.088	38.06	1.319
PB-214	704.53	352.42	161.	248.	0.124	28.77	1.500
TL-208	1021.86	511.04	110.	137.	0.068	49.69	1.436s
TL-208	1167.79	583.98	53.	262.	0.131	23.09	1.349s
BI-214	1219.84	610.00	66.	200.	0.100	30.42	1.427s
BI-212	1456.26	728.15	72.	51.	0.025	93.49	0.997s
AC-228	1825.18	912.52	52.	182.	0.091	31.69	1.625
AC-228	1938.01	968.90	95.	36.	0.018	123.74	1.718D
BI-214	2244.43	1122.02	27.	39.	0.020	77.37	2.469s
K-40	2926.47	1462.78	11.	609.	0.304	12.37	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		-9.1083E-02					
			477.56	-9.108E-02	&(	4.153E-01 1.22E-01	G
K-40		1.2808E+01					
			1460.75	1.281E+01	?(P	3.779E-01 5.28E-01	G
MN-54		-3.0372E-04					
			834.81	-3.037E-04	%(P	6.333E-02 1.80E-02	G
CO-57		-5.7366E-03					
			122.07	-5.737E-03	%(	5.210E-02 1.55E-02	G K
			136.43	1.221E-01	%	3.993E-01 1.20E-01	G
CO-60		-7.5706E-04					
			1332.51	-7.571E-04	%(P	4.559E-02 1.21E-02	G K
			1173.23	2.472E-03	%	7.875E-02 2.25E-02	G K
Sr-85		-2.4962E-02					
			514.00	-2.496E-02	%(	6.401E-02 1.93E-02	G
Kr-85		-5.1907E+02					
			513.99	-5.191E+02	%(	1.331E+03 4.01E+02	G
Y-88		9.0100E-03					
			1836.01	9.010E-03	%(P	4.302E-02 1.18E-02	G K
			898.02	-1.021E-03	% P	5.805E-02 1.61E-02	G
NB-94		1.5832E-02					
			871.10	1.583E-02	%(	3.900E-02 1.17E-02	G K
			702.50	-3.191E-04	&	4.540E-02 1.28E-02	G K
Ag-108M		-8.1165E-03					
			722.95	-8.117E-03	%(	5.757E-02 1.67E-02	G K
			614.37	-2.541E-02	& P	6.083E-02 1.83E-02	G
			433.93	-1.777E-03	%	4.338E-02 1.25E-02	G
CD-109		5.0031E-01					
			88.04	5.003E-01	%(P	1.920E+00 5.77E-01	G
SN-113		-1.3169E-02					
			391.71	-1.317E-02	%(	6.583E-02 1.94E-02	G K
			255.04	-1.947E-01	%	1.810E+00 5.35E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	-2.5166E-03						
		427.95	-2.517E-03	&(P	1.336E-01	3.83E-02	G K
		600.77	-2.743E-02	% P	2.219E-01	6.38E-02	G
		636.15	-1.200E-01	% P	4.036E-01	1.19E-01	G
		463.51	2.797E-01	% P	3.941E-01	1.22E-01	G
		176.29	1.488E-01	& P	5.412E-01	1.62E-01	G
I-131	0.0000E+00						
		364.48	0.000E+00	%(	1.147E-01	3.33E-02	G K
		636.97	4.142E-01	%	1.056E+00	3.16E-01	G
		284.29	-2.214E-01	&	1.191E+00	3.52E-01	G
CS-134	-2.7388E-03						
		604.66	-2.739E-03	%(	4.726E-02	1.36E-02	G K
		795.76	4.431E-02	%	5.887E-02	1.86E-02	G
		569.29	8.199E-02	&	2.112E-01	6.31E-02	G
		801.84	2.693E-02	% P	5.574E-01	1.58E-01	G
CS-137	1.4291E-03						
		661.62	1.429E-03	&(	5.157E-02	1.46E-02	G
CE-139	-4.8891E-03						
		165.85	-4.889E-03	%(P	4.913E-02	1.46E-02	G
EU-152	-1.4127E-03						
		121.78	-1.413E-03	&(P	1.435E-01	4.25E-02	G K
		344.30	3.915E-02	%	1.287E-01	3.84E-02	G
		1408.08	-3.507E-03	&	2.276E-01	6.09E-02	G
		964.00	9.509E-02	& P	4.156E-01	1.21E-01	G
		1112.07	8.223E-02	&	4.363E-01	1.26E-01	G
		778.90	-6.389E-02	% P	4.611E-01	1.34E-01	G
EU-154	-1.5336E-02						
		123.10	-1.534E-02	%(P	1.148E-01	3.43E-02	G K
		1274.80	2.469E-03	%	1.665E-01	4.60E-02	G
		723.30	-4.091E-02	% P	2.679E-01	7.77E-02	G
		1004.80	-6.380E-02	&	3.391E-01	9.83E-02	G
EU-155	1.8329E-02						
		86.45	1.833E-02	&(P	2.515E-01	7.52E-02	G K
		105.31	-1.589E-02	%	2.069E-01	6.16E-02	G
HG-203	2.3318E-02						
		279.17	2.332E-02	%(P	4.656E-02	1.41E-02	G K
		72.87	-3.900E-01	&	2.161E+00	6.49E-01	G
		70.83	1.073E+00	%	3.850E+00	1.16E+00	G
		82.50	-5.609E-01	%	4.182E+00	1.25E+00	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	3.0555E-01						
		583.14	3.056E-01	*(P	4.251E-02	2.36E-02	G
		510.72	5.349E-01	+	2.023E-01	8.86E-02	G
PB-212	7.0405E-01						
		238.63	6.785E-01	(	1.013E-01	3.96E-02	G K
							Energy duplication
		77.11	7.669E-01	*(	5.497E-01	1.72E-01	G
		74.81	8.443E-01	& P	1.152E+00	3.52E-01	G
PB-214	4.0806E-01						
		351.99	4.081E-01	(P	1.015E-01	3.92E-02	G K
		295.22	3.333E-01	-	1.954E-01	6.45E-02	G
							Energy duplication
		77.11	1.254E+00	+	8.990E-01	2.81E-01	G
		241.92	1.885E-01	%	6.315E-01	1.90E-01	G
BI-212	5.3178E-01						
		727.17	5.318E-01	(	4.406E-01	1.66E-01	G K
		1620.56	2.714E-01	% P	1.301E+00	3.53E-01	G
		785.42	-2.415E-01	% P	2.679E+00	7.69E-01	G
BI-214	4.5740E-01						
		609.32	4.531E-01	@(	9.190E-02	4.60E-02	G K
		1764.51	-6.321E-02	% P	3.419E-01	9.54E-02	G
		1120.28	4.707E-01	(	3.195E-01	1.22E-01	G
RA-224	3.9191E-01						
		241.00	3.919E-01	&(P	1.118E+00	3.36E-01	G
RA-226	1.2586E+00						
		185.99	1.259E+00	(P	1.238E+00	3.84E-01	G
AC-228	9.2083E-01						
		911.07	9.463E-01	(P	1.875E-01	1.00E-01	G K
		968.90	3.306E-01	- P	4.365E-01	1.36E-01	G
		338.40	8.593E-01	(	2.716E-01	1.09E-01	G
TH-227	-6.4350E-02						
		236.00	-6.435E-02	%(P	4.031E-01	1.20E-01	G K
		256.25	-3.380E-02	&	5.374E-01	1.58E-01	G
PA-234	6.3948E-02						
		98.44	6.395E-02	%(	2.269E-01	6.83E-02	G K
		946.00	-7.104E-02	%	2.420E-01	7.10E-02	G
		131.28	-5.147E-02	%	2.150E-01	6.45E-02	G
		94.67	-2.006E-01	%	4.209E-01	1.28E-01	G
		883.24	6.536E-02	&	3.600E-01	1.03E-01	G
		926.70	1.414E-02	&	3.713E-01	1.02E-01	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26 2.693E-02 &   3.676E-01 1.05E-01 G

TH-234       6.8570E-01
                           63.29 6.857E-01 %(P 4.394E+00 1.32E+00 G K
                           92.80 1.227E+00 %   2.149E+00 6.54E-01 G
                           92.38 9.534E-03 % P 2.662E+00 7.93E-01 G

AM-241      -8.6349E-02
                           59.54-8.635E-02 &(  6.258E-01 1.87E-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	-8.0220E-02	-9.1083E-02	3.6597E-01	3.6601E-01	3.657E-01
K-40	#	1.2808E+01	1.2808E+01	1.5841E+00	1.7396E+00	3.779E-01
MN-54	#A	-2.9719E-04	-3.0372E-04	2.3072E-02	2.3072E-02	6.197E-02
CO-57	#B	-5.5943E-03	-5.7366E-03	4.6627E-02	4.6628E-02	5.080E-02
CO-60	#B	-7.5440E-04	-7.5706E-04	5.6336E-02	5.6336E-02	4.543E-02

Sr-85	#A	-2.2483E-02	-2.4962E-02	5.7790E-02	5.7807E-02	5.765E-02
Kr-85	#A	-5.1903E+02	-5.1907E+02	1.2017E+03	1.2021E+03	1.331E+03
Y-88	#B	8.4546E-03	9.0100E-03	3.5440E-02	3.5444E-02	4.037E-02
NB-94	#B	1.5832E-02	1.5832E-02	3.5013E-02	3.5024E-02	3.900E-02
Ag-108M	#B	-8.1153E-03	-8.1165E-03	5.0072E-02	5.0074E-02	5.756E-02
CD-109	#A	4.9288E-01	5.0031E-01	1.7322E+00	1.7325E+00	1.891E+00
SN-113	#B	-1.2416E-02	-1.3169E-02	5.8324E-02	5.8329E-02	6.207E-02
SB-125	#B	-2.4998E-03	-2.5166E-03	2.2990E-01	2.2990E-01	1.327E-01
I-131	#B	0.0000E+00	0.0000E+00	9.9945E-02	9.9945E-02	4.933E-02
CS-134	#B	-2.7142E-03	-2.7388E-03	4.0709E-02	4.0709E-02	4.684E-02
CS-137	#A	1.4282E-03	1.4291E-03	4.3857E-02	4.3857E-02	5.154E-02
CE-139	#A	-4.6538E-03	-4.8891E-03	4.7522E-02	4.7523E-02	4.676E-02
EU-152	#B	-1.4106E-03	-1.4127E-03	8.7738E-01	8.7738E-01	1.433E-01
EU-154	#B	-1.5302E-02	-1.5336E-02	1.0537E-01	1.0537E-01	1.146E-01
EU-155	#B	1.8260E-02	1.8329E-02	2.2565E-01	2.2565E-01	2.506E-01
HG-203	#B	2.0160E-02	2.3318E-02	4.2424E-02	4.2444E-02	4.025E-02
TL-208	#	3.0555E-01	3.0555E-01	7.0647E-02	7.2698E-02	
PB-212	#	7.0405E-01	7.0405E-01	1.2328E-01	1.2946E-01	1.013E-01
PB-214	#	4.0806E-01	4.0806E-01	1.1760E-01	1.1981E-01	1.015E-01
BI-212		5.3178E-01	5.3178E-01	4.9716E-01	4.9805E-01	
BI-214		4.5740E-01	4.5740E-01	1.3913E-01	1.4148E-01	
RA-224	#A	3.9191E-01	3.9191E-01	1.0094E+00	1.0096E+00	1.118E+00
RA-226	#	1.2586E+00	1.2586E+00	1.1533E+00	1.1555E+00	1.238E+00
AC-228		9.2083E-01	9.2083E-01	2.2814E-01	2.3392E-01	
TH-227	#B	-6.4350E-02	-6.4350E-02	3.7282E-01	3.7284E-01	4.031E-01
PA-234	#B	6.3948E-02	6.3948E-02	2.0488E-01	2.0491E-01	2.269E-01
TH-234	#B	6.8570E-01	6.8570E-01	3.9480E+00	3.9482E+00	4.394E+00
AM-241	#A	-8.6345E-02	-8.6349E-02	5.6143E-01	5.6145E-01	6.258E-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) 2.2155578E+00 pCi/gm
Total Decayed Activity (1119.8 to 1999.0 keV) 2.2155578E+00 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JJM

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

Sample description
FSS-OOL-10-03-009-F

Spectrum Filename: C:\GammaVision\Spectra\102F_28JUN2006_1955.An1

Acquisition information

Start time:	28-Jun-2006 19:55:19
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:	1.7880E+03
Activity scaling factor:	1.0000E+06/(1.0000E+00* 1.7880E+03) = 5.5928E+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	26-Jun-2006 14:42:00
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. 10 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.7804

***** 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
75.04	111.	37.62	1.50	8.847E-03	74.81	9.600	PBC<MDA	PB212
77.22	191.	22.29	1.50	9.541E-03	77.11	10.700	1.413E+00	PB214
					77.11	17.500	8.638E-01	PB212
77.22	191.	22.29	1.50	9.541E-03	77.11	10.700	1.413E+00	PB214
					77.11	17.500	8.638E-01	PB212
186.19	93.	30.25	1.28	1.626E-02	185.99	3.280	PBC<MDA	RA226
239.09	605.	4.71	1.22	1.378E-02	238.63	43.100	7.679E-01	PB212
					241.00	3.900	8.537E+00	RA224
242.61	69.	27.02	1.22	1.362E-02	241.92	7.470	5.121E-01	PB214
277.25	42.	38.99	1.26	1.215E-02				
295.72	131.	14.53	1.18	1.145E-02	295.22	19.200	4.484E-01	PB214
338.85	109.	18.13	1.11	1.005E-02	338.40	12.010	6.831E-01	AC228
352.69	215.	12.13	1.47	9.660E-03	351.99	37.100	4.511E-01	PB214
511.70	57.	24.77	1.50	6.695E-03	510.72	22.500	2.860E-01	TL208
584.08	197.	10.18	1.34	5.881E-03	583.14	86.000	2.932E-01	TL208
610.69	147.	11.34	1.17	5.637E-03	609.32	46.090	4.279E-01	BI214
728.61	28.	34.56	1.55	4.794E-03	727.17	11.800	PBC<MDA	BI212
912.74	128.	13.47	1.25	3.916E-03				
970.24	102.	17.71	1.32	3.713E-03				
1122.10	39.	26.46	1.04	3.279E-03	1120.28	15.040	5.969E-01	BI214
1463.24	458.	4.75	2.09	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

477.82	239.13	104.	605.	0.302	14.14	1.215	PB-212	D
484.84	242.64	140.	69.	0.035	81.07	1.218	XE-138	D
1825.62	912.74	45.	129.	0.065	34.38	1.250	AC-228	M

Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM	Suspected	
1940.69	970.24	50.	103.	0.051	41.55	1.319	AC-228	M
2927.39	1463.24	3.	459.	0.230	14.08	2.087	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	149.66	75.04	869.	111.	0.056	112.87	1.500s
PB-214	153.80	77.11	809.	191.	0.095	66.87	1.500D
PB-212	153.80	77.11	809.	191.	0.095	66.87	1.500D
RA-226	372.44	186.41	381.	74.	0.037	109.62	1.500
PB-212	477.82	239.09	350.	519.	0.259	20.19	1.500
RA-224	477.83	239.10	213.	540.	0.270	17.21	1.500s
PB-214	591.19	295.77	147.	126.	0.063	48.88	1.500s
AC-228	677.59	338.96	112.	95.	0.047	56.67	1.500
PB-214	705.01	352.66	107.	199.	0.100	30.55	1.500s
TL-208	1023.17	511.70	71.	57.	0.029	74.30	1.499s
TL-208	1168.17	584.17	52.	174.	0.087	28.66	1.499s
BI-214	1221.23	610.69	46.	147.	0.074	34.03	1.169s
BI-212	1457.18	728.61	34.	28.	0.014	103.67	1.554s
BI-214	2244.59	1122.10	27.	39.	0.020	79.38	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		-1.4104E-03					
			477.56	-1.410E-03	%(	4.143E-01 1.17E-01	G
K-40		-6.5549E-02					
			1460.75	-6.555E-02	%(P	7.313E-01 2.03E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
MN-54	8.9381E-03						
		834.81	8.938E-03	&(P	4.615E-02	1.31E-02	G
CO-57	-2.4945E-03						
		122.07	-2.495E-03	&(	5.734E-02	1.70E-02	G K
		136.43	7.962E-03	%	4.301E-01	1.27E-01	G
CO-60	1.3725E-04						
		1332.51	1.372E-04	&(P	6.450E-02	1.74E-02	G K
		1173.23	4.263E-02	&	6.775E-02	2.12E-02	G K
Sr-85	-1.8087E-02						
		514.00	-1.809E-02	%(	6.182E-02	1.84E-02	G
Kr-85	-4.0777E+02						
		513.99	-4.078E+02	%(	1.394E+03	4.14E+02	G
Y-88	-7.9544E-03						
		1836.01	-7.954E-03	%(P	5.717E-02	1.53E-02	G K
		898.02	-1.246E-03	% P	6.291E-02	1.73E-02	G
NB-94	2.8895E-04						
		871.10	2.889E-04	%(	5.004E-02	1.37E-02	G K
		702.50	1.145E-03	&	4.736E-02	1.32E-02	G K
Ag-108M	-5.0982E-03						
		722.95	-5.098E-03	%(	5.002E-02	1.41E-02	G K
		614.37	-1.811E-02	% P	6.437E-02	1.90E-02	G
		433.93	9.499E-04	%	4.738E-02	1.35E-02	G
CD-109	-2.9383E-01						
		88.04	-2.938E-01	%(P	2.216E+00	6.62E-01	G
SN-113	2.1115E-02						
		391.71	2.111E-02	&(	5.077E-02	1.53E-02	G K
		255.04	-3.561E-01	%	2.035E+00	6.03E-01	G
SB-125	2.8680E-02						
		427.95	2.868E-02	%(P	1.370E-01	4.00E-02	G K
		600.77	-4.807E-03	& P	2.290E-01	6.37E-02	G
		636.15	-8.525E-04	& P	4.337E-01	1.21E-01	G
		463.51	2.271E-01	% P	4.557E-01	1.38E-01	G
		176.29	1.208E-01	% P	6.312E-01	1.88E-01	G
I-131	1.0568E-02						
		364.48	1.057E-02	%(	5.631E-02	1.65E-02	G K
		636.97	3.417E-02	&	6.802E-01	1.89E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
		284.29	-7.637E-02	&	8.652E-01	2.54E-01	G
CS-134	8.1364E-04						
		604.66	8.136E-04	&(	4.010E-02	1.11E-02	G K
		795.76	2.642E-02	%	6.477E-02	1.94E-02	G
		569.29	1.676E-02	&	2.251E-01	6.27E-02	G
		801.84	-8.740E-02	% P	6.147E-01	1.75E-01	G
CS-137	2.7543E-02						
		661.62	2.754E-02	%(	5.008E-02	1.54E-02	G
CE-139	-1.3677E-02						
		165.85	-1.368E-02	%(P	5.748E-02	1.72E-02	G
EU-152	-5.9356E-03						
		121.78	-5.936E-03	&(P	1.623E-01	4.80E-02	G K
		344.30	-2.354E-02	%	1.401E-01	4.10E-02	G
		1408.08	4.065E-02	%	1.943E-01	5.34E-02	G
		964.00	-3.194E-03	% P	4.481E-01	1.24E-01	G
		1112.07	1.532E-01	&	5.164E-01	1.52E-01	G
		778.90	1.360E-02	% P	4.416E-01	1.24E-01	G
EU-154	-6.9185E-03						
		123.10	-6.919E-03	&(P	1.154E-01	3.42E-02	G K
		1274.80	-1.784E-02	%	1.969E-01	5.50E-02	G
		723.30	-2.012E-02	% P	2.358E-01	6.59E-02	G
		1004.80	9.655E-02	&	3.001E-01	8.81E-02	G
EU-155	1.8019E-01						
		86.45	1.802E-01	%(P	2.556E-01	7.82E-02	G K
		105.31	2.412E-03	%	2.712E-01	8.05E-02	G
HG-203	-1.3253E-02						
		279.17	-1.325E-02	&(P	5.660E-02	1.68E-02	G K
		72.87	-6.313E-02	&	2.415E+00	7.21E-01	G
		70.83	-1.765E+00	%	3.981E+00	1.21E+00	G
		82.50	-6.734E-02	%	4.608E+00	1.37E+00	G
TL-208	2.6492E-01						
		583.14	2.594E-01	@(P	5.412E-02	2.48E-02	G
		510.72	2.860E-01	*(	2.108E-01	7.08E-02	G
PB-212	6.5908E-01						
		238.63	6.591E-01	(	1.142E-01	4.43E-02	G K
							Energy duplication
		77.11	8.638E-01	+	6.123E-01	1.93E-01	G
		74.81	9.890E-01	& P	1.246E+00	3.82E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
PB-214	4.2386E-01						
		351.99	4.196E-01	*(P	1.073E-01	4.28E-02	G K
		295.22	4.321E-01	*(	2.035E-01	7.04E-02	G
							Energy duplication
		77.11	1.413E+00	+	1.001E+00	3.15E-01	G
		241.92	3.081E-01	%	7.250E-01	2.19E-01	G
BI-212	3.8036E-01						
		727.17	3.804E-01	*(	4.001E-01	1.31E-01	G K
		1620.56	-3.465E-02	& P	1.580E+00	3.74E-01	G
		785.42	-3.997E-01	% P	2.683E+00	7.67E-01	G
BI-214	4.2786E-01						
		609.32	4.279E-01	@(	9.921E-02	4.86E-02	G K
		1764.51	-1.849E-03	& P	1.572E-01	2.13E-02	G
		1120.28	5.969E-01	+	4.121E-01	1.58E-01	G
RA-224	7.6457E+00						
		241.00	7.646E+00	?(P	1.000E+00	4.40E-01	G
RA-226	1.0548E+00						
		185.99	1.055E+00	(P	1.327E+00	4.09E-01	G
AC-228	1.6747E-01						
		911.07	-8.127E-03	%(P	2.351E-01	6.61E-02	G K
		968.90	-1.082E-02	% P	3.618E-01	1.01E-01	G
		338.40	5.915E-01	(	3.258E-01	1.12E-01	G
TH-227	-1.4707E-01						
		236.00	-1.471E-01	%(P	4.731E-01	1.42E-01	G K
		256.25	-1.894E-02	%	5.100E-01	1.48E-01	G
PA-234	2.6765E-02						
		98.44	2.676E-02	%(	2.548E-01	7.60E-02	G K
		946.00	-4.764E-02	%	3.157E-01	9.03E-02	G
		131.28	5.257E-04	&	2.313E-01	6.84E-02	G
		94.67	-5.262E-02	%	4.801E-01	1.43E-01	G
		883.24	-9.297E-03	&	3.727E-01	1.01E-01	G
		926.70	6.367E-02	&	4.404E-01	1.24E-01	G
		569.26	2.687E-02	&	3.326E-01	9.28E-02	G
TH-234	1.2835E+00						
		63.29	1.283E+00	&(P	4.725E+00	1.42E+00	G K
		92.80	1.358E+00	%	2.462E+00	7.49E-01	G
		92.38	6.204E-02	% P	2.949E+00	8.77E-01	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments

AM-241      -5.4019E-02
                            59.54-5.402E-02 %(  6.125E-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	-1.3704E-03	-1.4104E-03	3.5136E-01	3.5136E-01	4.026E-01
K-40	#A	-6.5549E-02	-6.5549E-02	6.9086E-01	6.9087E-01	7.313E-01
MN-54	#A	8.8942E-03	8.9381E-03	3.9386E-02	3.9389E-02	4.592E-02
CO-57	#B	-2.4804E-03	-2.4945E-03	5.1017E-02	5.1018E-02	5.701E-02
CO-60	#B	1.3714E-04	1.3725E-04	5.2116E-02	5.2116E-02	6.444E-02
Sr-85	#A	-1.7663E-02	-1.8087E-02	5.5150E-02	5.5159E-02	6.037E-02
Kr-85	#A	-4.0776E+02	-4.0777E+02	1.2434E+03	1.2436E+03	1.394E+03
Y-88	#B	-7.8406E-03	-7.9544E-03	4.6317E-02	4.6319E-02	5.635E-02
NB-94	#B	2.8895E-04	2.8895E-04	4.1047E-02	4.1047E-02	5.004E-02
Ag-108M	#B	-5.0980E-03	-5.0982E-03	4.2217E-02	4.2218E-02	5.002E-02
CD-109	#A	-2.9284E-01	-2.9383E-01	2.3399E+00	2.3400E+00	2.208E+00

SN-113	#B	2.0834E-02	2.1115E-02	4.5782E-02	4.5797E-02	5.010E-02
SB-125	#B	2.8636E-02	2.8680E-02	1.1988E-01	1.1989E-01	1.367E-01
I-131	#B	8.7293E-03	1.0568E-02	4.9464E-02	4.9467E-02	4.651E-02
CS-134	#B	8.1198E-04	8.1364E-04	3.3295E-02	3.3295E-02	4.002E-02
CS-137	#A	2.7539E-02	2.7543E-02	4.6216E-02	4.6242E-02	5.008E-02
CE-139	#A	-1.3525E-02	-1.3677E-02	5.3473E-02	5.3479E-02	5.684E-02
EU-152	#B	-5.9337E-03	-5.9356E-03	2.2882E-01	2.2882E-01	1.623E-01
EU-154	#B	-6.9151E-03	-6.9185E-03	1.0959E-01	1.0959E-01	1.153E-01
EU-155	#B	1.8003E-01	1.8019E-01	2.3446E-01	2.3468E-01	2.554E-01
HG-203	#B	-1.2823E-02	-1.3253E-02	5.1068E-02	5.1073E-02	5.477E-02
TL-208	#	2.6492E-01	2.6492E-01	7.6107E-02	7.7545E-02	5.412E-02
PB-212	#	6.5908E-01	6.5908E-01	1.3304E-01	1.3809E-01	1.142E-01
PB-214	#	4.2386E-01	4.2386E-01	1.2223E-01	1.2452E-01	1.073E-01
BI-212	#A	3.8036E-01	3.8036E-01	3.9430E-01	3.9488E-01	4.001E-01
BI-214		4.2786E-01	4.2786E-01	1.4562E-01	1.4759E-01	
RA-224	#	7.6457E+00	7.6457E+00	1.3185E+00	1.3866E+00	1.000E+00
RA-226	#A	1.0548E+00	1.0548E+00	1.2255E+00	1.2269E+00	1.327E+00
AC-228	B	1.6747E-01	1.6747E-01	9.4903E-02	9.5367E-02	2.351E-01
TH-227	#B	-1.4707E-01	-1.4707E-01	4.3421E-01	4.3429E-01	4.731E-01
PA-234	#B	2.6765E-02	2.6765E-02	2.2790E-01	2.2790E-01	2.548E-01
TH-234	#B	1.2835E+00	1.2835E+00	4.2570E+00	4.2576E+00	4.725E+00
AM-241	#A	-5.4018E-02	-5.4019E-02	5.4553E-01	5.4553E-01	6.125E-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 1999.0 keV) 5.9532362E-01 pCi/gm
Total Decayed Activity (277.2 to 1999.0 keV) 5.9532362E-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_29JUN2006_1756.An1

Sample description
FSS-OOL-10-03-024-F-B

Spectrum Filename: C:\GammaVision\Spectra\102F_29JUN2006_1756.An1

Acquisition information
Start time: 29-Jun-2006 17:56:17
Live time: 2000
Real time: 2023
Dead time: 1.15 %
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: 2.2220E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 2.2220E+03) =
4.5005E+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-Jun-2006 15:48:00
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: 0.7645

***** 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	143.	33.87	1.50	8.847E-03	72.87	6.400	1.775E+00	HG203
					74.81	9.600	PBC<MDA	PB212
77.17	219.	21.86	1.50	9.541E-03	77.11	17.500	7.973E-01	PB212
					77.11	10.700	1.304E+00	PB214
77.17	219.	21.86	1.50	9.541E-03	77.11	17.500	PBC<MDA	PB212
					77.11	10.700	1.304E+00	PB214
140.77	83.	37.71	0.59	1.739E-02				
186.17	94.	29.55	1.26	1.626E-02	185.99	3.280	PBC<MDA	RA226
210.17	85.	35.68	1.74	1.515E-02				
239.06	758.	4.51	1.22	1.379E-02	238.63	43.100	7.748E-01	PB212
242.24	104.	21.81	1.22	1.364E-02	241.00	3.900	PBC<MDA	RA224
					241.92	7.470	6.220E-01	PB214
270.74	64.	30.75	1.56	1.241E-02				
295.53	175.	13.47	1.39	1.145E-02	295.22	19.200	4.846E-01	PB214
329.37	66.	33.26	1.80	1.033E-02				
339.00	200.	14.10	1.40	1.004E-02	338.40	12.010	1.005E+00	AC228
352.47	266.	10.06	1.23	9.666E-03	351.99	37.100	4.499E-01	PB214
463.93	56.	29.39	1.27	7.358E-03	463.51	10.000	4.521E-01	SB125
511.76	125.	16.82	2.20	6.682E-03	510.72	22.500	5.047E-01	TL208
584.15	225.	9.95	1.50	5.880E-03	583.14	86.000	2.697E-01	TL208
610.16	184.	10.32	1.46	5.642E-03	609.32	46.090	4.298E-01	BI214
728.45	64.	27.89	0.77	4.786E-03	727.17	11.800	6.859E-01	BI212
912.44	157.	11.35	1.85	3.917E-03	911.07	29.000	8.367E-01	AC228
969.33	111.	15.73	1.25	3.716E-03	968.90	17.460	1.043E+00	AC228
1121.96	62.	35.19	1.16	3.279E-03	1120.28	15.040	7.636E-01	BI214
1462.97	631.	4.00	1.92	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	
419.95	210.17	344.	85.	0.042	107.04	1.739	NP-239	s
477.74	239.00	205.	758.	0.379	13.53	1.215	PB-212	D
484.11	242.18	207.	104.	0.052	65.44	1.217	PB-214	D
541.13	270.74	154.	64.	0.032	92.26	1.560	AC-228	s
658.40	329.37	160.	66.	0.033	99.79	1.804	TH-227	s
1938.87	969.33	118.	51.	0.026	99.04	1.251	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	149.30	74.86	1146.	143.	0.071	101.60	1.500
PB-212	153.80	77.11	1035.	219.	0.109	65.58	1.500D
PB-214	153.80	77.11	1035.	219.	0.109	65.58	1.500D
RA-226	372.31	186.35	541.	89.	0.045	109.50	1.500
PB-212	477.71	239.04	475.	680.	0.340	17.81	1.500
PB-214	590.87	295.61	204.	167.	0.084	43.05	1.500
AC-228	677.69	339.00	179.	200.	0.100	42.29	1.398s
PB-214	704.59	352.45	134.	237.	0.119	28.37	1.500
SB-125	927.50	463.88	93.	46.	0.023	95.45	1.500
TL-208	1023.30	511.76	99.	125.	0.062	50.45	2.204s
TL-208	1168.13	584.15	92.	225.	0.112	29.84	1.497
BI-214	1220.17	610.16	63.	184.	0.092	30.95	1.460
Ag-108M	1224.78	612.46	154.	-47.	-0.023	121.53	1.499s
BI-212	1456.85	728.45	70.	64.	0.032	83.66	0.770s
AC-228	1825.02	912.44	49.	156.	0.078	34.04	1.845
AC-228	1941.29	970.54	66.	60.	0.030	69.19	1.718
BI-214	2244.32	1121.96	90.	62.	0.031	105.57	1.157s
K-40	2926.83	1462.96	8.	619.	0.309	12.22	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		1.9636E-03					
			477.56	1.964E-03	%(	4.179E-01 1.20E-01	G
K-40		1.3414E+01					
			1460.75	1.341E+01	(P	3.479E-01 5.46E-01	G
MN-54		-1.1378E-02					
			834.81	-1.138E-02	%(P	6.002E-02 1.75E-02	G
CO-57		7.9998E-03					
			122.07	8.000E-03	&(	5.633E-02 1.68E-02	G K
			136.43	-1.137E-01	%	4.575E-01 1.37E-01	G
CO-60		3.7170E-04					
			1332.51	3.717E-04	%(P	5.242E-02 1.42E-02	G K
			1173.23	-5.557E-03	%	6.311E-02 1.79E-02	G K
Sr-85		1.6627E-03					
			514.00	1.663E-03	&(	5.162E-02 1.49E-02	G
Kr-85		3.6221E+01					
			513.99	3.622E+01	&(	1.129E+03 3.26E+02	G
Y-88		4.5557E-03					
			1836.01	4.556E-03	%(P	4.413E-02 1.16E-02	G K
			898.02	-8.491E-04	% P	3.884E-02 1.03E-02	G
NB-94		1.4926E-02					
			871.10	1.493E-02	%(	3.870E-02 1.15E-02	G K
			702.50	-4.743E-03	%	5.058E-02 1.45E-02	G K
Ag-108M		2.8240E-03					
			722.95	2.824E-03	%(	4.582E-02 1.29E-02	G K
			614.37	-5.607E-02	& P	7.278E-02 2.26E-02	G
			433.93	-8.669E-03	&	4.578E-02 1.35E-02	G
CD-109		2.3825E-01					
			88.04	2.382E-01	%(P	1.971E+00 5.90E-01	G
SN-113		-1.8173E-02					
			391.71	-1.817E-02	%(	6.878E-02 2.05E-02	G K
			255.04	-1.597E-01	&	1.934E+00 5.71E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	1.5065E-01						
		427.95	7.195E-02	%(P	9.961E-02	3.11E-02	G K
		600.77	3.200E-02	& P	2.142E-01	6.17E-02	G
		636.15	4.451E-03	& P	3.808E-01	1.07E-01	G
		463.51	3.836E-01	(P	3.958E-01	1.26E-01	G
		176.29	4.956E-02	& P	6.735E-01	2.00E-01	G
I-131	-4.0603E-03						
		364.48	-4.060E-03	&(	7.327E-02	2.13E-02	G K
		636.97	2.451E-01	&	8.370E-01	2.47E-01	G
		284.29	-5.643E-03	%	8.105E-01	2.35E-01	G
CS-134	-6.4495E-03						
		604.66	-6.449E-03	%(	4.820E-02	1.40E-02	G K
		795.76	3.420E-02	%	4.960E-02	1.56E-02	G
		569.29	-1.107E-02	&	2.478E-01	7.03E-02	G
		801.84	-9.664E-02	% P	5.804E-01	1.68E-01	G
CS-137	1.7861E-02						
		661.62	1.786E-02	%(	5.483E-02	1.63E-02	G
CE-139	-4.3856E-03						
		165.85	-4.386E-03	%(P	5.083E-02	1.51E-02	G
EU-152	-2.9884E-02						
		121.78	-2.988E-02	%(P	1.589E-01	4.76E-02	G K
		344.30	-4.218E-02	%	1.483E-01	4.42E-02	G
		1408.08	-3.125E-02	&	2.762E-01	7.73E-02	G
		964.00	-1.193E-01	% P	5.085E-01	1.49E-01	G
		1112.07	1.401E-01	%	4.103E-01	1.21E-01	G
		778.90	1.289E-01	& P	3.192E-01	9.56E-02	G
EU-154	2.0385E-02						
		123.10	2.038E-02	&(P	1.171E-01	3.51E-02	G K
		1274.80	4.059E-02	&	1.624E-01	4.71E-02	G
		723.30	-5.704E-04	% P	2.275E-01	6.37E-02	G
		1004.80	-4.504E-03	&	2.758E-01	7.61E-02	G
EU-155	1.3232E-01						
		86.45	1.323E-01	%(P	2.375E-01	7.22E-02	G K
		105.31	5.716E-02	%	2.370E-01	7.11E-02	G
HG-203	-1.7420E-03						
		279.17	-1.742E-03	&(P	5.562E-02	1.64E-02	G K
		72.87	-6.740E-01	%	1.922E+00	5.80E-01	G
		70.83	-1.143E+00	%	3.959E+00	1.19E+00	G
		82.50	-6.303E-01	%	4.244E+00	1.27E+00	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	2.6966E-01						
		583.14	2.697E-01	(P	5.704E-02	2.69E-02	G
		510.72	5.047E-01	+	1.981E-01	8.50E-02	G
PB-212	7.2476E-01						
		238.63	6.953E-01	(	1.066E-01	4.13E-02	G K
							Energy duplication
		77.11	7.973E-01	@(	5.560E-01	1.74E-01	G
		74.81	1.021E+00	& P	1.149E+00	3.53E-01	G
PB-214	4.2241E-01						
		351.99	4.019E-01	(P	9.601E-02	3.81E-02	G K
		295.22	4.621E-01	(	1.915E-01	6.63E-02	G
							Energy duplication
		77.11	1.304E+00	+	9.093E-01	2.85E-01	G
		241.92	3.769E-01	%	6.774E-01	2.06E-01	G
BI-212	6.8590E-01						
		727.17	6.859E-01	(	4.489E-01	1.92E-01	G K
		1620.56	1.836E-01	& P	1.138E+00	2.94E-01	G
		785.42	4.267E-01	% P	2.112E+00	6.09E-01	G
BI-214	4.2978E-01						
		609.32	4.298E-01	(	9.272E-02	4.44E-02	G K
		1764.51	-6.072E-02	% P	3.676E-01	1.02E-01	G
		1120.28	7.636E-01	+	5.779E-01	2.69E-01	G
RA-224	7.8565E-01						
		241.00	7.856E-01	&(P	1.303E+00	3.97E-01	G
RA-226	1.0155E+00						
		185.99	1.016E+00	(P	1.266E+00	3.89E-01	G
AC-228	8.8590E-01						
		911.07	8.367E-01	(P	1.881E-01	9.52E-02	G K
		968.90	5.629E-01	- P	3.803E-01	1.30E-01	G
		338.40	1.005E+00	*(	3.278E-01	1.42E-01	G
TH-227	-2.0658E-01						
		236.00	-2.066E-01	%(P	4.605E-01	1.39E-01	G K
		256.25	1.463E-02	&	6.003E-01	1.77E-01	G
PA-234	-6.5290E-03						
		98.44	-6.529E-03	%(	2.296E-01	6.84E-02	G K
		946.00	-8.641E-02	%	3.313E-01	9.76E-02	G
		131.28	-4.544E-02	&	2.452E-01	7.35E-02	G
		94.67	9.158E-03	%	4.188E-01	1.25E-01	G
		883.24	0.000E+00	&	3.522E-01	9.66E-02	G
		926.70	2.181E-03	%	3.180E-01	8.49E-02	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26-4.078E-02 &   3.450E-01 9.87E-02 G

TH-234       1.1131E+00
                           63.29 1.113E+00 %(P 4.366E+00 1.31E+00 G K
                           92.80 1.581E+00 %   2.278E+00 6.96E-01 G
                           92.38-1.958E-03 & P 2.745E+00 8.18E-01 G

AM-241       1.0167E-01
                           59.54 1.017E-01 &(  6.423E-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:                      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-03	1.9636E-03	3.5892E-01	3.5892E-01	3.912E-01
K-40		1.3414E+01	1.3414E+01	1.6392E+00	1.8038E+00	3.479E-01
MN-54	#A	-1.1251E-02	-1.1378E-02	5.5311E-02	5.5315E-02	5.934E-02
CO-57	#B	7.8959E-03	7.9998E-03	5.0535E-02	5.0537E-02	5.560E-02
CO-60	#B	3.7102E-04	3.7170E-04	4.2466E-02	4.2466E-02	5.232E-02

Sr-85	#A	1.5746E-03	1.6627E-03	4.4759E-02	4.4759E-02	4.888E-02
Kr-85	#A	3.6220E+01	3.6221E+01	9.7863E+02	9.7863E+02	1.129E+03
Y-88	#B	4.4074E-03	4.5557E-03	3.4692E-02	3.4693E-02	4.270E-02
NB-94	#B	1.4926E-02	1.4926E-02	3.4585E-02	3.4595E-02	3.870E-02
Ag-108M	#B	2.8238E-03	2.8240E-03	3.8737E-02	3.8738E-02	4.582E-02
CD-109	#A	2.3640E-01	2.3825E-01	1.7693E+00	1.7694E+00	1.956E+00
SN-113	#B	-1.7625E-02	-1.8173E-02	6.1362E-02	6.1371E-02	6.670E-02
SB-125	#F	1.5013E-01	1.5065E-01	1.2280E-01	1.2309E-01	9.927E-02
I-131	#B	-2.6183E-03	-4.0603E-03	6.4001E-02	6.4001E-02	4.725E-02
CS-134	#B	-6.4193E-03	-6.4495E-03	4.1936E-02	4.1937E-02	4.797E-02
CS-137	#A	1.7855E-02	1.7861E-02	4.8848E-02	4.8858E-02	5.482E-02
CE-139	#A	-4.2745E-03	-4.3856E-03	4.9660E-02	4.9660E-02	4.954E-02
EU-152	#B	-2.9862E-02	-2.9884E-02	1.5343E-01	1.5343E-01	1.588E-01
EU-154	#B	2.0362E-02	2.0385E-02	1.0518E-01	1.0519E-01	1.170E-01
EU-155	#B	1.3206E-01	1.3232E-01	2.1654E-01	2.1666E-01	2.371E-01
HG-203	#B	-1.6150E-03	-1.7420E-03	5.2700E-02	5.2700E-02	5.157E-02
TL-208		2.6966E-01	2.6966E-01	8.0622E-02	8.2030E-02	
PB-212	#	7.2476E-01	7.2476E-01	1.2908E-01	1.3534E-01	1.066E-01
PB-214	#	4.2241E-01	4.2241E-01	1.0895E-01	1.1150E-01	9.601E-02
BI-212		6.8590E-01	6.8590E-01	5.7380E-01	5.7509E-01	
BI-214		4.2978E-01	4.2978E-01	1.3303E-01	1.3519E-01	
RA-224	#A	7.8565E-01	7.8565E-01	1.1916E+00	1.1925E+00	1.303E+00
RA-226	#A	1.0155E+00	1.0155E+00	1.1677E+00	1.1690E+00	1.266E+00
AC-228		8.8590E-01	8.8590E-01	2.4059E-01	2.4568E-01	
TH-227	#B	-2.0658E-01	-2.0658E-01	4.2279E-01	4.2295E-01	4.605E-01
PA-234	#B	-6.5290E-03	-6.5290E-03	2.0513E-01	2.0513E-01	2.296E-01
TH-234	#B	1.1131E+00	1.1131E+00	3.9369E+00	3.9374E+00	4.366E+00
AM-241	#A	1.0167E-01	1.0167E-01	5.7669E-01	5.7672E-01	6.423E-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 (968.9 to 1999.0 keV) 1.5685528E+01 pCi/gm
Total Decayed Activity (968.9 to 1999.0 keV) 1.5685528E+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_29JUNE2006_1032.An1

Sample description
FSS-OOL-10-03-012-F

Spectrum Filename: C:\GammaVision\Spectra\102F_29JUNE2006_1032.An1

Acquisition information
Start time: 29-Jun-2006 10:34:05
Live time: 2000
Real time: 2023
Dead time: 1.16 %
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: 1.8200E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.8200E+03) =
5.4945E+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	26-Jun-2006 15:12:00
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: 0.6779

***** 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	144.	32.81	1.50	8.847E-03				
74.85	144.	32.81	1.50	8.847E-03	74.81	9.600	PBC<MDA	PB212
77.17	233.	20.23	1.50	9.541E-03	77.11	10.700	1.692E+00	PB214
					77.11	17.500	1.035E+00	PB212
77.17	233.	20.23	1.50	9.541E-03	77.11	10.700	1.692E+00	PB214
					77.11	17.500	1.035E+00	PB212
90.05	88.	32.80	1.11	1.281E-02				
93.34	136.	21.06	1.11	1.347E-02	92.80	3.000	2.516E+00	TH234
186.53	139.	25.23	1.51	1.624E-02	185.99	3.280	1.875E+00	RA226
209.19	74.	37.68	1.14	1.520E-02				
239.07	929.	5.25	1.18	1.378E-02	238.63	43.100	1.159E+00	PB212
270.73	128.	22.75	1.95	1.241E-02				
295.73	161.	11.44	1.26	1.145E-02	295.22	19.200	5.444E-01	PB214
300.48	74.	21.23	1.26	1.128E-02				
339.10	155.	16.33	1.37	1.004E-02	338.40	12.010	9.550E-01	AC228
352.57	260.	8.59	1.22	9.663E-03	351.99	37.100	5.368E-01	PB214
463.75	63.	22.93	1.70	7.361E-03	463.51	10.000	6.167E-01	SB125
511.60	123.	16.12	1.31	6.684E-03	510.72	22.500	6.063E-01	TL208
583.97	278.	7.65	1.30	5.882E-03	583.14	86.000	4.069E-01	TL208
610.33	179.	10.79	1.44	5.640E-03	609.32	46.090	5.093E-01	BI214
912.42	198.	9.98	1.60	3.917E-03	911.07	29.000	1.289E+00	AC228
966.52	34.	28.29	1.71	3.734E-03	964.00	14.580	4.656E-01	EU152
969.23	171.	10.10	1.92	3.717E-03	968.90	17.460	1.956E+00	AC228
1462.81	610.	4.15	2.06	2.618E-03	1460.75	10.700	1.614E+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	
179.69	90.21	371.	88.	0.044	98.39	1.109	PB-214	lD

Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM	Suspected	
186.16	93.50	354.	121.	0.061	71.08	1.112	U-235	D
418.00	209.19	304.	74.	0.037	113.05	1.138	AC-228	
477.77	239.07	1219.	163.	0.082	93.67	1.180	PB-212	
541.10	270.73	240.	128.	0.064	68.25	1.952	AC-228	s
600.45	300.40	158.	80.	0.040	83.55	1.337	PB-212	
1457.84	728.94	36.	61.	0.030	60.22	1.404	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	149.27	74.85	1097.	144.	0.072	98.44	1.500
PB-214	153.80	77.11	991.	233.	0.116	60.70	1.500D
PB-212	153.80	77.11	991.	233.	0.116	60.70	1.500D
TH-234	186.18	93.30	894.	126.	0.063	104.36	1.500s
RA-226	371.97	186.18	466.	122.	0.061	76.97	1.500s
PB-212	477.66	239.01	436.	728.	0.364	16.48	1.500
PB-214	591.09	295.72	188.	142.	0.071	48.01	1.500
AC-228	677.87	339.10	175.	155.	0.078	49.00	1.365
PB-214	704.81	352.56	128.	269.	0.135	25.49	1.500
SB-125	927.70	463.98	66.	61.	0.030	66.51	1.500s
TL-208	1022.98	511.60	90.	123.	0.062	48.35	1.308s
TL-208	1167.76	583.97	58.	278.	0.139	22.94	1.304s
BI-214	1220.52	610.33	71.	179.	0.089	32.37	1.440
AC-228	1824.98	912.42	51.	197.	0.099	29.95	1.602
EU-152	1933.24	966.52	30.	34.	0.017	84.88	1.714s
AC-228	1938.67	969.23	31.	171.	0.085	30.29	1.921s
K-40	2926.66	1462.87	12.	586.	0.293	12.64	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		1.6961E-02					
			477.56	1.696E-02	%(	4.129E-01 1.17E-01	G
K-40		1.5524E+01					
			1460.75	1.552E+01	?(P	5.028E-01 6.54E-01	G
MN-54		-1.4853E-02					
			834.81	-1.485E-02	%(P	6.656E-02 1.94E-02	G
CO-57		1.2710E-02					
			122.07	1.271E-02	%(	6.438E-02 1.93E-02	G K
			136.43	-5.584E-02	%	5.007E-01 1.49E-01	G
CO-60		-1.3261E-02					
			1332.51	-1.326E-02	%(P	7.150E-02 2.04E-02	G K
			1173.23	3.432E-02	%	8.404E-02 2.52E-02	G K
Sr-85		-1.0696E-02					
			514.00	-1.070E-02	&(	6.069E-02 1.78E-02	G
Kr-85		-2.4425E+02					
			513.99	-2.443E+02	&(	1.360E+03 3.99E+02	G
Y-88		6.4586E-03					
			1836.01	6.459E-03	%(P	4.250E-02 1.11E-02	G K
			898.02	1.540E-02	% P	5.243E-02 1.52E-02	G
NB-94		-3.9287E-03					
			871.10	-3.929E-03	%(	6.309E-02 1.79E-02	G K
			702.50	-8.428E-03	%	5.479E-02 1.58E-02	G K
Ag-108M		-9.2721E-03					
			722.95	-9.272E-03	%(	6.668E-02 1.92E-02	G K
			614.37	-4.623E-02	% P	8.917E-02 2.71E-02	G
			433.93	-5.780E-03	%	5.965E-02 1.74E-02	G
CD-109		-8.8351E-02					
			88.04	-8.835E-02	%(P	2.180E+00 6.49E-01	G
SN-113		1.1951E-02					
			391.71	1.195E-02	%(	7.251E-02 2.13E-02	G K
			255.04	-3.074E-01	%	2.386E+00 7.07E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	1.6781E-01						
		427.95	1.696E-02	%(P	1.535E-01	4.45E-02	G K
		600.77	5.478E-03	& P	2.803E-01	7.94E-02	G
		636.15	8.120E-02	% P	5.060E-01	1.47E-01	G
		463.51	6.143E-01	(P	4.096E-01	1.40E-01	G
		176.29	-2.259E-02	% P	7.002E-01	2.06E-01	G
I-131	1.9349E-04						
		364.48	1.935E-04	&(	5.983E-02	1.71E-02	G K
		636.97	2.297E-01	%	9.286E-01	2.72E-01	G
		284.29	1.675E-01	%	8.808E-01	2.61E-01	G
CS-134	5.9405E-04						
		604.66	5.941E-04	%(	5.283E-02	1.50E-02	G K
		795.76	4.054E-02	%	6.547E-02	2.03E-02	G
		569.29	5.938E-02	%	3.522E-01	1.03E-01	G
		801.84	-7.207E-02	% P	6.322E-01	1.80E-01	G
CS-137	-1.2664E-03						
		661.62	-1.266E-03	%(	6.768E-02	1.92E-02	G
CE-139	1.7386E-02						
		165.85	1.739E-02	%(P	6.080E-02	1.83E-02	G
EU-152	1.7647E-01						
		121.78	3.228E-02	%(P	1.934E-01	5.79E-02	G K
		344.30	-2.671E-03	%	1.805E-01	5.26E-02	G
		1408.08	-6.933E-05	&	3.091E-01	8.32E-02	G
		964.00	4.656E-01	?(P	3.870E-01	1.33E-01	G
		1112.07	1.125E-01	&	6.482E-01	1.88E-01	G
		778.90	-4.096E-02	& P	3.915E-01	1.11E-01	G
EU-154	3.5553E-02						
		123.10	3.555E-02	%(P	1.246E-01	3.74E-02	G K
		1274.80	0.000E+00	%	1.741E-01	4.70E-02	G
		723.30	3.483E-02	% P	2.988E-01	8.58E-02	G
		1004.80	2.741E-02	&	3.889E-01	1.10E-01	G
EU-155	1.2668E-01						
		86.45	1.267E-01	%(P	2.800E-01	8.48E-02	G K
		105.31	3.212E-02	%	2.631E-01	7.85E-02	G
HG-203	3.1893E-02						
		279.17	3.189E-02	%(P	4.763E-02	1.47E-02	G K
		72.87	-7.819E-01	%	2.502E+00	7.55E-01	G
		70.83	3.097E-02	&	5.072E+00	1.52E+00	G
		82.50	1.281E-01	&	3.303E+00	9.79E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	4.0691E-01						
		583.14	4.069E-01	@(P	5.618E-02	3.12E-02	G
		510.72	6.063E-01	+	2.313E-01	9.79E-02	G
PB-212	9.4502E-01						
		238.63	9.087E-01	(	1.248E-01	4.99E-02	G K
							Energy duplication
		77.11	1.035E+00	(	6.645E-01	2.09E-01	G
		74.81	1.261E+00	& P	1.373E+00	4.22E-01	G
PB-214	5.3058E-01						
		351.99	5.569E-01	(P	1.147E-01	4.74E-02	G K
		295.22	4.796E-01	(	2.245E-01	7.68E-02	G
							Energy duplication
		77.11	1.692E+00	+	1.087E+00	3.42E-01	G
		241.92	1.395E-01	%	8.441E-01	2.52E-01	G
BI-212	1.4482E-02						
		727.17	1.448E-02	&(	5.961E-01	1.71E-01	G K
		1620.56	-1.787E-02	% P	1.647E+00	3.99E-01	G
		785.42	3.693E-01	% P	3.017E+00	8.65E-01	G
BI-214	5.0931E-01						
		609.32	5.093E-01	(	1.200E-01	5.50E-02	G K
		1764.51	-5.982E-02	& P	4.398E-01	1.21E-01	G
		1120.28	-8.300E-02	&	5.826E-01	1.68E-01	G
RA-224	5.0269E-01						
		241.00	5.027E-01	%(P	1.590E+00	4.78E-01	G
RA-226	1.6959E+00						
		185.99	1.696E+00	*(P	1.438E+00	4.51E-01	G
AC-228	1.2885E+00						
		911.07	1.289E+00	(P	2.342E-01	1.29E-01	G K
		968.90	1.956E+00	+ P	3.279E-01	1.97E-01	G
		338.40	9.550E-01	-	3.951E-01	1.56E-01	G
TH-227	-2.5199E-01						
		236.00	-2.520E-01	%(P	5.704E-01	1.73E-01	G K
		256.25	-1.235E-01	%	6.835E-01	2.03E-01	G
PA-234	-1.0300E-01						
		98.44	-1.030E-01	%(	2.720E-01	8.22E-02	G K
		946.00	2.497E-03	%	3.206E-01	8.94E-02	G
		131.28	9.079E-02	&	2.687E-01	8.10E-02	G
		94.67	-1.590E-01	%	4.738E-01	1.43E-01	G
		883.24	1.353E-02	&	3.596E-01	9.76E-02	G
		926.70	0.000E+00	&	7.290E-01	2.07E-01	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26 8.728E-02 %   5.214E-01 1.52E-01 G

TH-234       1.1243E+00
                           63.29 1.931E-01 &(P 4.483E+00 1.33E+00 G K
                           92.80 2.335E+00 @(  2.637E+00 8.12E-01 G
                           92.38 2.249E-02 & P 2.561E+00 7.59E-01 G

AM-241      -1.5554E-01
                           59.54-1.555E-01 %(  6.152E-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	1.6355E-02	1.6961E-02	3.5243E-01	3.5243E-01	3.982E-01
K-40	#	1.5524E+01	1.5524E+01	1.9628E+00	2.1474E+00	5.028E-01
MN-54	#A	-1.4761E-02	-1.4853E-02	6.1175E-02	6.1181E-02	6.615E-02
CO-57	#B	1.2619E-02	1.2710E-02	5.7845E-02	5.7849E-02	6.391E-02
CO-60	#B	-1.3247E-02	-1.3261E-02	6.3029E-02	6.3033E-02	7.143E-02

Sr-85	#A	-1.0380E-02	-1.0696E-02	5.3454E-02	5.3457E-02	5.890E-02
Kr-85	#A	-2.4425E+02	-2.4425E+02	1.1981E+03	1.1982E+03	1.360E+03
Y-88	#B	6.3418E-03	6.4586E-03	3.3205E-02	3.3207E-02	4.174E-02
NB-94	#B	-3.9287E-03	-3.9287E-03	5.3556E-02	5.3557E-02	6.309E-02
Ag-108M	#B	-9.2717E-03	-9.2721E-03	5.7747E-02	5.7750E-02	6.667E-02
CD-109	#A	-8.7972E-02	-8.8351E-02	3.3690E+00	3.3690E+00	2.170E+00
SN-113	#B	1.1750E-02	1.1951E-02	6.3827E-02	6.3831E-02	7.129E-02
SB-125	#F	1.6749E-01	1.6781E-01	1.1444E-01	1.1483E-01	1.532E-01
I-131	#B	1.5190E-04	1.9349E-04	5.1418E-02	5.1418E-02	4.697E-02
CS-134	#B	5.9252E-04	5.9405E-04	4.4870E-02	4.4870E-02	5.269E-02
CS-137	#A	-1.2662E-03	-1.2664E-03	5.7641E-02	5.7641E-02	6.766E-02
CE-139	#A	1.7142E-02	1.7386E-02	5.4773E-02	5.4782E-02	5.994E-02
EU-152	#B	1.7639E-01	1.7647E-01	1.5080E-01	1.5111E-01	1.933E-01
EU-154	#B	3.5531E-02	3.5553E-02	1.1233E-01	1.1235E-01	1.245E-01
EU-155	#B	1.2654E-01	1.2668E-01	2.5426E-01	2.5436E-01	2.797E-01
HG-203	#B	3.0589E-02	3.1893E-02	4.4056E-02	4.4092E-02	4.568E-02
TL-208	#	4.0691E-01	4.0691E-01	9.3492E-02	9.6240E-02	
PB-212	#	9.4502E-01	9.4502E-01	1.5577E-01	1.6455E-01	1.248E-01
PB-214	#	5.3058E-01	5.3058E-01	1.3546E-01	1.3870E-01	1.147E-01
BI-212	#B	1.4482E-02	1.4482E-02	5.1205E-01	5.1205E-01	5.961E-01
BI-214		5.0931E-01	5.0931E-01	1.6486E-01	1.6732E-01	
RA-224	#A	5.0269E-01	5.0269E-01	1.4347E+00	1.4350E+00	1.590E+00
RA-226	#	1.6959E+00	1.6959E+00	1.3530E+00	1.3564E+00	1.438E+00
AC-228		1.2885E+00	1.2885E+00	3.8634E-01	3.9304E-01	
TH-227	#B	-2.5199E-01	-2.5199E-01	5.2356E-01	5.2375E-01	5.704E-01
PA-234	#B	-1.0300E-01	-1.0300E-01	2.4647E-01	2.4654E-01	2.720E-01
TH-234	#B	1.1243E+00	1.1243E+00	1.1733E+00	1.1750E+00	4.483E+00
AM-241	#A	-1.5554E-01	-1.5554E-01	5.5304E-01	5.5311E-01	6.152E-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 (129.2 to 1999.0 keV) 2.2047124E+00 pCi/gm
Total Decayed Activity (129.2 to 1999.0 keV) 2.2047124E+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_29JUNE2006_1436.An1

Sample description
FSS-OOL-10-03-019-F

Spectrum Filename: C:\GammaVision\Spectra\102F_29JUNE2006_1436.An1

Acquisition information
Start time: 29-Jun-2006 14:38:07
Live time: 2000
Real time: 2022
Dead time: 1.08 %
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: 1.8230E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.8230E+03) =
5.4855E+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	26-Jun-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. 13 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.6595

***** 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	213.	21.48	1.50	9.541E-03	77.11	10.700	1.544E+00	PB214
					77.11	17.500	9.440E-01	PB212
77.24	213.	21.48	1.50	9.541E-03	77.11	10.700	1.544E+00	PB214
					77.11	17.500	9.440E-01	PB212
128.85	89.	37.25	0.99	1.714E-02				
186.19	102.	25.72	1.38	1.626E-02	185.99	3.280	PBC<MDA	RA226
209.98	51.	41.46	0.75	1.516E-02				
239.02	728.	4.46	1.22	1.379E-02	238.63	43.100	9.076E-01	PB212
239.01	670.	4.97	1.50	1.365E-02	238.63	43.100	8.351E-01	PB212
241.92	104.	24.38	1.22	1.366E-02	241.00	3.900	PBC<MDA	RA224
270.68	86.	26.85	1.19	1.241E-02				
295.74	148.	11.65	1.26	1.145E-02	295.22	19.200	4.992E-01	PB214
300.48	45.	34.29	1.26	1.128E-02				
328.32	57.	34.85	1.21	1.036E-02				
338.90	104.	21.27	1.72	1.005E-02	338.40	12.010	6.393E-01	AC228
352.58	258.	10.15	1.20	9.663E-03	351.99	37.100	5.326E-01	PB214
463.59	60.	24.43	1.23	7.363E-03	463.51	10.000	5.916E-01	SB125
511.34	120.	18.06	0.98	6.687E-03	510.72	22.500	5.910E-01	TL208
584.10	236.	9.89	1.46	5.881E-03	583.14	86.000	3.445E-01	TL208
610.32	163.	11.83	1.24	5.641E-03	609.32	46.090	4.635E-01	BI214
728.20	50.	28.69	0.83	4.794E-03	727.17	11.800	6.526E-01	BI212
764.34	32.	36.44	1.37	4.582E-03				
912.64	137.	13.43	1.57	3.916E-03	911.07	29.000	8.914E-01	AC228
970.00	124.	12.41	1.96	3.714E-03	968.90	17.460	1.413E+00	AC228
1121.59	76.	22.81	1.25	3.283E-03	1120.28	15.040	1.141E+00	BI214
1239.54	46.	41.57	1.40	3.013E-03				
1462.68	566.	4.33	2.02	2.618E-03	1460.75	10.700	1.497E+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
257.29	128.85	429.	98.	0.049	94.43	0.993	AC-228 s
419.58	209.98	198.	51.	0.025	124.37	0.748	NP-239 s
477.68	238.92	164.	728.	0.364	13.38	1.215	PB-212 D
483.48	241.82	267.	104.	0.052	73.13	1.217	PB-214 D
541.01	270.68	173.	86.	0.043	80.54	1.185	AC-228 s
600.56	300.45	136.	46.	0.023	122.49	1.568	PB-212 s
656.32	328.32	135.	57.	0.029	104.54	1.208	RH-106M
1528.68	764.34	37.	32.	0.016	109.31	1.370	AG-110M s
2479.64	1239.54	81.	46.	0.023	124.71	1.405	CO-56 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	937.	213.	0.106	64.45	1.500D
PB-212	153.80	77.11	937.	213.	0.106	64.45	1.500D
RA-226	372.39	186.39	466.	105.	0.052	88.29	1.500s
PB-212	477.65	239.01	392.	649.	0.325	17.49	1.500s
PB-214	477.66	239.01	220.	670.	0.335	14.91	1.500
PB-214	591.16	295.76	151.	163.	0.081	39.78	1.500
AC-228	677.48	338.90	149.	104.	0.052	63.80	1.717s
PB-214	704.67	352.49	121.	239.	0.120	27.46	1.500s
SB-125	927.22	463.74	52.	45.	0.022	78.54	1.500
TL-208	1022.46	511.34	90.	120.	0.060	54.19	0.975s
TL-208	1168.03	584.10	82.	235.	0.118	29.68	1.464
BI-214	1220.49	610.32	67.	163.	0.081	35.50	1.238s
BI-212	1456.35	728.20	53.	50.	0.025	86.06	0.832s
AC-228	1825.43	912.64	48.	137.	0.068	40.29	1.570s
AC-228	1940.21	970.00	31.	124.	0.062	37.24	1.962
BI-214	2243.58	1121.59	51.	76.	0.038	68.42	1.249s
K-40	2926.39	1462.74	12.	539.	0.269	13.20	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		1.3609E-01					
			477.56	1.361E-01	&(	4.959E-01 1.47E-01	G
K-40		1.4247E+01					
			1460.75	1.425E+01	(P	4.952E-01 6.27E-01	G
MN-54		-7.7709E-04					
			834.81	-7.771E-04	%(P	5.899E-02 1.64E-02	G
CO-57		1.8400E-02					
			122.07	1.840E-02	%(	5.599E-02 1.68E-02	G K
			136.43	1.233E-02	&	4.147E-01 1.23E-01	G
CO-60		-1.0249E-03					
			1332.51	-1.025E-03	%(P	7.065E-02 1.93E-02	G K
			1173.23	-1.653E-02	%	8.215E-02 2.38E-02	G K
Sr-85		-1.0520E-02					
			514.00	-1.052E-02	%(	5.955E-02 1.75E-02	G
Kr-85		-2.3535E+02					
			513.99	-2.354E+02	%(	1.331E+03 3.91E+02	G
Y-88		-2.3238E-05					
			1836.01	-2.324E-05	%(P	2.610E-02 3.54E-03	G K
			898.02	8.077E-03	& P	6.421E-02 1.82E-02	G
NB-94		4.0551E-03					
			871.10	4.055E-03	%(	5.458E-02 1.53E-02	G K
			702.50	1.068E-02	%	4.993E-02 1.45E-02	G K
Ag-108M		1.6573E-03					
			722.95	1.657E-03	&(	6.040E-02 1.70E-02	G K
			614.37	-3.371E-02	& P	7.825E-02 2.36E-02	G
			433.93	1.186E-02	%	4.462E-02 1.32E-02	G
CD-109		2.2977E-01					
			88.04	2.298E-01	%(P	2.354E+00 7.04E-01	G
SN-113		1.6684E-02					
			391.71	1.668E-02	&(	7.166E-02 2.12E-02	G K
			255.04	-1.039E-02	&	2.110E+00 6.18E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	1.1210E-01						
		427.95	-3.148E-03	&(P	1.517E-01	4.32E-02	G K
		600.77	-9.849E-04	& P	3.134E-01	8.92E-02	G
		636.15	-9.591E-02	% P	4.575E-01	1.33E-01	G
		463.51	4.532E-01	(P	3.674E-01	1.23E-01	G
		176.29	-5.096E-02	% P	6.002E-01	1.76E-01	G
I-131	2.3836E-03						
		364.48	2.384E-03	&(	6.522E-02	1.88E-02	G K
		636.97	1.682E-01	%	8.460E-01	2.45E-01	G
		284.29	-1.686E-01	%	9.661E-01	2.86E-01	G
CS-134	3.6490E-03						
		604.66	3.649E-03	%(	5.283E-02	1.51E-02	G K
		795.76	4.058E-02	%	6.614E-02	2.05E-02	G
		569.29	9.604E-02	%	3.142E-01	9.30E-02	G
		801.84	-1.593E-02	% P	6.330E-01	1.77E-01	G
CS-137	1.9271E-03						
		661.62	1.927E-03	&(	6.591E-02	1.87E-02	G
CE-139	-2.4160E-04						
		165.85	-2.416E-04	%(P	6.107E-02	1.81E-02	G
EU-152	5.4483E-02						
		121.78	5.448E-02	%(P	1.669E-01	5.02E-02	G K
		344.30	-2.956E-03	&	1.798E-01	5.24E-02	G
		1408.08	3.301E-02	%	2.749E-01	7.57E-02	G
		964.00	2.792E-01	% P	4.156E-01	1.30E-01	G
		1112.07	5.161E-02	%	5.136E-01	1.45E-01	G
		778.90	6.371E-04	% P	4.284E-01	1.20E-01	G
EU-154	1.8679E-02						
		123.10	1.868E-02	%(P	1.088E-01	3.24E-02	G K
		1274.80	-3.059E-02	%	2.280E-01	6.51E-02	G
		723.30	-7.456E-02	& P	3.378E-01	9.89E-02	G
		1004.80	-3.726E-02	%	3.659E-01	1.04E-01	G
EU-155	8.3443E-04						
		86.45	8.344E-04	%(P	2.917E-01	8.69E-02	G K
		105.31	3.945E-02	%	2.664E-01	7.96E-02	G
HG-203	1.7677E-02						
		279.17	1.768E-02	%(P	5.170E-02	1.55E-02	G K
		72.87	-6.149E-01	&	2.324E+00	7.00E-01	G
		70.83	2.151E-01	%	4.242E+00	1.27E+00	G
		82.50	-6.061E-01	&	4.582E+00	1.37E+00	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	3.4448E-01						
		583.14	3.445E-01	(P	6.557E-02	3.42E-02	G
		510.72	5.910E-01	+	2.308E-01	1.07E-01	G
PB-212	8.4779E-01						
		238.63	8.087E-01	@(	1.183E-01	4.72E-02	G K
							Energy duplication
		77.11	9.440E-01	@(	6.453E-01	2.03E-01	G
		74.81	6.604E-01	& P	1.342E+00	4.07E-01	G
PB-214	5.1216E-01						
		351.99	4.937E-01	@(P	1.114E-01	4.53E-02	G K
		295.22	5.478E-01	(	2.021E-01	7.26E-02	G
							Energy duplication
		77.11	1.544E+00	+	1.055E+00	3.32E-01	G
		241.92	4.871E+00	+	5.220E-01	2.42E-01	G
BI-212	6.5257E-01						
		727.17	6.526E-01	(	4.809E-01	1.87E-01	G K
		1620.56	-3.773E-02	% P	2.463E+00	6.48E-01	G
		785.42	5.463E-01	& P	2.702E+00	7.81E-01	G
BI-214	4.6348E-01						
		609.32	4.635E-01	@(	1.165E-01	5.49E-02	G K
		1764.51	-1.813E-03	& P	3.509E-01	8.88E-02	G
		1120.28	1.141E+00	+	5.403E-01	2.60E-01	G
RA-224	9.0871E-01						
		241.00	9.087E-01	%(P	1.490E+00	4.55E-01	G
RA-226	1.4541E+00						
		185.99	1.454E+00	*(P	1.435E+00	4.46E-01	G
AC-228	8.9142E-01						
		911.07	8.914E-01	@(P	2.286E-01	1.20E-01	G K
		968.90	1.413E+00	+ P	3.283E-01	1.76E-01	G
		338.40	6.393E-01	-	3.654E-01	1.36E-01	G
TH-227	-2.6702E-01						
		236.00	-2.670E-01	%(P	5.486E-01	1.66E-01	G K
		256.25	-6.578E-02	%	6.474E-01	1.91E-01	G
PA-234	1.1118E-04						
		98.44	1.112E-04	%(	2.254E-01	6.67E-02	G K
		946.00	-2.724E-04	%	2.767E-01	7.60E-02	G
		131.28	-2.026E-02	&	2.603E-01	7.75E-02	G
		94.67	-1.043E-01	%	4.967E-01	1.49E-01	G
		883.24	-1.275E-02	%	4.461E-01	1.24E-01	G
		926.70	-3.653E-03	%	2.720E-01	6.87E-02	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26 1.421E-01 %   4.648E-01 1.38E-01 G

TH-234       8.2528E-02
                           63.29 8.253E-02 &(P 3.796E+00 1.12E+00 G K
                           92.80 1.676E+00 %   2.658E+00 8.11E-01 G
                           92.38-2.109E-01 % P 3.232E+00 9.64E-01 G

AM-241      -1.7224E-01
                           59.54-1.722E-01 %(  7.110E-01 2.13E-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	1.3091E-01	1.3609E-01	4.4051E-01	4.4058E-01	4.771E-01
K-40		1.4247E+01	1.4247E+01	1.8807E+00	2.0436E+00	4.952E-01
MN-54	#A	-7.7195E-04	-7.7709E-04	1.4172E-01	1.4172E-01	5.860E-02
CO-57	#B	1.8259E-02	1.8400E-02	5.0548E-02	5.0558E-02	5.556E-02
CO-60	#B	-1.0238E-03	-1.0249E-03	8.6688E-02	8.6688E-02	7.057E-02

Sr-85	#A	-1.0190E-02	-1.0520E-02	5.2410E-02	5.2414E-02	5.767E-02
Kr-85	#A	-2.3535E+02	-2.3535E+02	1.1719E+03	1.1720E+03	1.331E+03
Y-88	#B	-2.2791E-05	-2.3238E-05	1.3943E-04	1.3944E-04	2.559E-02
NB-94	#B	4.0551E-03	4.0551E-03	4.5936E-02	4.5937E-02	5.458E-02
Ag-108M	#B	1.6573E-03	1.6573E-03	5.1047E-02	5.1047E-02	6.040E-02
CD-109	#A	2.2872E-01	2.2977E-01	2.1105E+00	2.1106E+00	2.343E+00
SN-113	#B	1.6386E-02	1.6684E-02	6.3526E-02	6.3533E-02	7.038E-02
SB-125	#B	1.1187E-01	1.1210E-01	9.1070E-02	9.1287E-02	1.514E-01
I-131	#B	1.8422E-03	2.3836E-03	5.6503E-02	5.6504E-02	5.041E-02
CS-134	#B	3.6390E-03	3.6490E-03	4.5280E-02	4.5281E-02	5.268E-02
CS-137	#A	1.9267E-03	1.9271E-03	5.6133E-02	5.6133E-02	6.590E-02
CE-139	#A	-2.3799E-04	-2.4160E-04	4.7414E-02	4.7414E-02	6.015E-02
EU-152	#B	5.4459E-02	5.4483E-02	1.5061E-01	1.5064E-01	1.668E-01
EU-154	#B	1.8667E-02	1.8679E-02	9.7289E-02	9.7295E-02	1.087E-01
EU-155	#B	8.3348E-04	8.3443E-04	2.6070E-01	2.6070E-01	2.914E-01
HG-203	#B	1.6908E-02	1.7677E-02	4.6492E-02	4.6502E-02	4.946E-02
TL-208		3.4448E-01	3.4448E-01	1.0243E-01	1.0424E-01	
PB-212	#	8.4779E-01	8.4779E-01	1.4828E-01	1.5573E-01	1.183E-01
PB-214	#	5.1216E-01	5.1216E-01	1.2385E-01	1.2714E-01	1.114E-01
BI-212		6.5257E-01	6.5257E-01	5.6159E-01	5.6278E-01	
BI-214	#	4.6348E-01	4.6348E-01	1.6454E-01	1.6658E-01	
RA-224	#A	9.0871E-01	9.0871E-01	1.3642E+00	1.3651E+00	1.490E+00
RA-226	#	1.4541E+00	1.4541E+00	1.3386E+00	1.3411E+00	1.435E+00
AC-228		8.9142E-01	8.9142E-01	3.5979E-01	3.6325E-01	
TH-227	#B	-2.6702E-01	-2.6702E-01	5.0426E-01	5.0448E-01	5.486E-01
PA-234	#B	1.1118E-04	1.1118E-04	2.0010E-01	2.0010E-01	2.254E-01
TH-234	#B	8.2528E-02	8.2528E-02	3.3635E+00	3.3635E+00	3.796E+00
AM-241	#A	-1.7224E-01	-1.7224E-01	6.4000E-01	6.4007E-01	7.110E-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) 1.6598465E+01 pCi/gm
Total Decayed Activity (270.7 to 1999.0 keV) 1.6598465E+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_29JUNE2006_1515.An1

Sample description
FSS-OOL-10-03-004-F

Spectrum Filename: C:\GammaVision\Spectra\102F_29JUNE2006_1515.An1

Acquisition information
Start time: 29-Jun-2006 15:15:22
Live time: 2000
Real time: 2023
Dead time: 1.12 %
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	26-Jun-2006 15:00:00
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. 13 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.6081

***** 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	109.	40.45	1.50	8.847E-03	74.81	9.600	PBC<MDA	PB212
77.34	176.	25.52	1.50	9.541E-03	77.11	10.700	1.186E+00	PB214
					77.11	17.500	7.253E-01	PB212
77.34	176.	25.52	1.50	9.541E-03	77.11	10.700	1.186E+00	PB214
					77.11	17.500	7.253E-01	PB212
89.97	109.	21.09	0.73	1.276E-02				
187.25	138.	23.62	1.57	1.621E-02	185.99	3.280	1.723E+00	RA226
209.68	131.	25.52	1.40	1.517E-02				
239.19	721.	5.76	1.10	1.378E-02	236.00	11.200	3.176E+00	TH227
					238.63	43.100	8.329E-01	PB212
295.41	138.	19.89	1.25	1.146E-02	295.22	19.200	4.315E-01	PB214
300.83	68.	30.16	0.79	1.126E-02				
338.94	147.	14.87	1.36	1.004E-02	338.40	12.010	8.340E-01	AC228
352.49	195.	9.91	1.36	9.665E-03	351.99	37.100	3.733E-01	PB214
462.47	44.	34.15	1.50	7.381E-03				
462.47	44.	34.15	1.50	7.381E-03	463.51	10.000	PBC<MDA	SB125
511.51	121.	19.00	1.58	6.685E-03	510.72	22.500	5.535E-01	TL208
					513.99	0.004	2.914E+03	Kr85
					514.00	99.270	1.304E-01	Sr85
584.05	228.	9.82	1.39	5.881E-03	583.14	86.000	3.082E-01	TL208
610.21	158.	11.38	1.39	5.642E-03	609.32	46.090	4.171E-01	BI214
728.46	73.	24.88	1.63	4.786E-03	727.17	11.800	8.846E-01	BI212
795.60	41.	34.75	1.45	4.420E-03				
795.60	41.	34.75	1.45	4.420E-03	795.76	85.400	7.488E-02	CS134
912.65	121.	11.30	1.60	3.916E-03	911.07	29.000	7.299E-01	AC228
969.41	117.	18.40	2.13	3.716E-03	968.90	17.460	1.239E+00	AC228
1122.06	74.	22.12	1.53	3.279E-03	1120.28	15.040	1.025E+00	BI214

1462.77	669.	3.93	1.86	2.618E-03	1460.75	10.700	1.640E+01	K40
1767.07	24.	20.96	2.24	2.225E-03	1764.51	15.920	4.569E-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	
418.98	209.68	355.	131.	0.066	76.55	1.399	NP-239	s
478.01	239.19	943.	112.	0.056	120.23	1.104	PB-212	
601.31	300.83	141.	68.	0.034	90.47	0.791	PB-212	s
924.68	462.47	66.	44.	0.022	102.45	1.496	CS-138	l
1591.23	795.60	54.	41.	0.021	104.25	1.449	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	149.46	74.94	976.	109.	0.055	121.34	1.500
PB-214	153.80	77.11	923.	176.	0.088	76.56	1.500D
PB-212	153.80	77.11	923.	176.	0.088	76.56	1.500D
TH-234	177.04	88.73	772.	-101.	-0.051	121.34	1.500s
RA-226	372.06	186.22	456.	77.	0.039	115.22	1.500s
PB-212	477.67	239.02	343.	581.	0.290	18.38	1.500
PB-214	590.99	295.67	200.	130.	0.065	53.13	1.500s
AC-228	677.55	338.94	126.	147.	0.073	44.61	1.362
PB-214	704.70	352.51	115.	195.	0.097	31.66	1.500
TL-208	1022.81	511.51	111.	121.	0.061	56.99	1.578
TL-208	1167.93	584.05	78.	227.	0.114	29.45	1.386
BI-214	1220.27	610.21	57.	158.	0.079	34.14	1.392
BI-212	1456.88	728.46	67.	73.	0.036	74.65	1.632
AC-228	1825.44	912.65	22.	121.	0.060	33.90	1.596s
AC-228	1939.02	969.41	77.	117.	0.058	55.20	2.134s
BI-214	2244.51	1122.06	50.	74.	0.037	66.37	1.533s
K-40	2926.47	1462.78	7.	650.	0.325	11.89	2.042
BI-214	3535.60	1767.07	1.	24.	0.012	62.87	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		-1.4324E-01					
			477.56	-1.432E-01	%(	4.468E-01 1.33E-01	G
K-40		1.5929E+01					
			1460.75	1.593E+01	(P	3.701E-01 6.32E-01	G
MN-54		-3.8391E-03					
			834.81	-3.839E-03	&(P	5.188E-02 1.46E-02	G
CO-57		-7.4861E-04					
			122.07	-7.486E-04	%(	5.878E-02 1.75E-02	G K
			136.43	8.245E-02	&	4.250E-01 1.27E-01	G
CO-60		-1.8890E-04					
			1332.51	-1.889E-04	%(P	6.095E-02 1.65E-02	G K
			1173.23	0.000E+00	%	9.993E-02 2.85E-02	G K
Sr-85		-1.2694E-03					
			514.00	-1.269E-03	%(	5.175E-02 1.49E-02	G
Kr-85		-2.9539E+01					
			513.99	-2.954E+01	%(	1.157E+03 3.32E+02	G
Y-88		-5.1265E-03					
			1836.01	-5.127E-03	%(P	4.797E-02 1.25E-02	G K
			898.02	-9.585E-04	% P	6.235E-02 1.73E-02	G
NB-94		1.0407E-02					
			871.10	1.041E-02	&(	4.824E-02 1.39E-02	G K
			702.50	6.106E-03	%	4.973E-02 1.43E-02	G K
Ag-108M		-7.0091E-03					
			722.95	-7.009E-03	%(	5.193E-02 1.48E-02	G K
			614.37	-1.413E-02	% P	6.000E-02 1.76E-02	G
			433.93	1.099E-02	%	4.574E-02 1.35E-02	G
CD-109		1.0962E+00					
			88.04	1.096E+00	%(P	2.080E+00 6.32E-01	G
SN-113		-1.9950E-02					
			391.71	-1.995E-02	%(	7.044E-02 2.10E-02	G K
			255.04	9.305E-01	%	1.690E+00 5.16E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	-2.3283E-02						
		427.95	-2.328E-02	&(P	1.538E-01	4.48E-02	G K
		600.77	9.941E-04	& P	2.419E-01	6.80E-02	G
		636.15	6.384E-03	% P	3.844E-01	1.08E-01	G
		463.51	2.444E-01	% P	4.126E-01	1.26E-01	G
		176.29	1.395E-01	% P	6.652E-01	1.99E-01	G
I-131	0.0000E+00						
		364.48	0.000E+00	&(	6.789E-02	1.96E-02	G K
		636.97	-8.129E-02	&	7.621E-01	2.17E-01	G
		284.29	4.189E-02	%	8.231E-01	2.41E-01	G
CS-134	1.7853E-04						
		604.66	1.785E-04	%(	4.973E-02	1.41E-02	G K
		795.76	4.699E-02	%	7.161E-02	2.23E-02	G
		569.29	-6.592E-02	%	3.087E-01	9.03E-02	G
		801.84	-1.041E-03	% P	6.180E-01	1.73E-01	G
CS-137	1.1660E-02						
		661.62	1.166E-02	&(	4.890E-02	1.42E-02	G
CE-139	-1.4842E-02						
		165.85	-1.484E-02	%(P	5.614E-02	1.68E-02	G
EU-152	1.8456E-02						
		121.78	1.846E-02	%(P	1.647E-01	4.91E-02	G K
		344.30	-1.796E-02	%	1.466E-01	4.29E-02	G
		1408.08	-2.542E-02	%	2.850E-01	7.86E-02	G
		964.00	1.802E-01	& P	4.497E-01	1.35E-01	G
		1112.07	2.046E-01	&	4.969E-01	1.49E-01	G
		778.90	-1.613E-03	& P	4.136E-01	1.16E-01	G
EU-154	-1.8229E-02						
		123.10	-1.823E-02	&(P	1.175E-01	3.51E-02	G K
		1274.80	2.214E-02	%	2.138E-01	6.07E-02	G
		723.30	-1.074E-03	% P	2.786E-01	7.85E-02	G
		1004.80	9.935E-02	%	2.609E-01	7.75E-02	G
EU-155	1.1019E-02						
		86.45	1.102E-02	&(P	2.218E-01	6.59E-02	G K
		105.31	1.623E-03	%	2.564E-01	7.61E-02	G
HG-203	-5.4693E-03						
		279.17	-5.469E-03	&(P	5.470E-02	1.61E-02	G K
		72.87	-1.563E-01	%	2.047E+00	6.12E-01	G
		70.83	-7.642E-01	%	4.018E+00	1.21E+00	G
		82.50	-3.183E-01	%	4.078E+00	1.22E+00	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	3.0816E-01						
		583.14	3.082E-01	(P	5.949E-02	3.04E-02	G
		510.72	5.535E-01	+	2.361E-01	1.05E-01	G
PB-212	6.8646E-01						
		238.63	6.707E-01	(	1.028E-01	4.11E-02	G K
							Energy duplication
		77.11	7.253E-01	(	5.939E-01	1.85E-01	G
		74.81	8.833E-01	& P	1.200E+00	3.67E-01	G
PB-214	3.8400E-01						
		351.99	3.725E-01	(P	1.006E-01	3.94E-02	G K
		295.22	4.063E-01	@(	2.145E-01	7.20E-02	G
							Energy duplication
		77.11	1.186E+00	+	9.714E-01	3.03E-01	G
		241.92	1.267E-01	%	7.189E-01	2.15E-01	G
BI-212	8.8457E-01						
		727.17	8.846E-01	(	4.971E-01	2.20E-01	G K
		1620.56	-3.047E-01	% P	2.010E+00	5.44E-01	G
		785.42	5.320E-01	% P	2.432E+00	7.04E-01	G
BI-214	4.2731E-01						
		609.32	4.171E-01	(	1.000E-01	4.75E-02	G K
		1764.51	4.569E-01	?(P	1.430E-01	9.61E-02	G
		1120.28	1.025E+00	+	4.983E-01	2.27E-01	G
RA-224	3.5716E-01						
		241.00	3.572E-01	&(P	1.306E+00	3.91E-01	G
RA-226	9.9535E-01						
		185.99	9.953E-01	@(P	1.317E+00	4.04E-01	G
AC-228	7.6038E-01						
		911.07	7.299E-01	@(P	1.492E-01	8.28E-02	G K
		968.90	1.239E+00	+ P	4.618E-01	2.28E-01	G
		338.40	8.340E-01	(	3.135E-01	1.24E-01	G
TH-227	-2.8446E-01						
		236.00	-2.845E-01	%(P	4.688E-01	1.43E-01	G K
		256.25	3.324E-02	&	5.618E-01	1.65E-01	G
PA-234	4.3444E-02						
		98.44	4.344E-02	%(	2.599E-01	7.78E-02	G K
		946.00	-3.269E-03	&	3.230E-01	9.08E-02	G
		131.28	7.748E-02	&	2.069E-01	6.24E-02	G
		94.67	-1.848E-01	&	4.662E-01	1.41E-01	G
		883.24	-1.577E-04	&	4.518E-01	1.25E-01	G
		926.70	-3.997E-02	&	4.312E-01	1.20E-01	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26-9.930E-02 %   4.574E-01 1.34E-01 G

TH-234       7.3092E-01
                           63.29 7.309E-01 &(P 4.589E+00 1.37E+00 G K
                           92.80 1.622E+00 %   2.486E+00 7.59E-01 G
                           92.38-2.046E+00 + P 2.669E+00 8.18E-01 G

AM-241       1.0422E-02
                           59.54 1.042E-02 &(  6.862E-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	-1.3775E-01	-1.4324E-01	3.9881E-01	3.9889E-01	4.296E-01
K-40		1.5929E+01	1.5929E+01	1.8946E+00	2.0949E+00	3.701E-01
MN-54	#A	-3.8136E-03	-3.8391E-03	5.2397E-02	5.2397E-02	5.153E-02
CO-57	#B	-7.4284E-04	-7.4861E-04	5.2363E-02	5.2363E-02	5.833E-02
CO-60	#B	-1.8869E-04	-1.8890E-04	7.6870E-03	7.6870E-03	6.089E-02

Sr-85	#A	-1.2292E-03	-1.2694E-03	4.4597E-02	4.4597E-02	5.011E-02
Kr-85	#A	-2.9539E+01	-2.9539E+01	9.9743E+02	9.9743E+02	1.157E+03
Y-88	#B	-5.0272E-03	-5.1265E-03	3.7934E-02	3.7935E-02	4.704E-02
NB-94	#B	1.0407E-02	1.0407E-02	4.1701E-02	4.1705E-02	4.824E-02
Ag-108M	#B	-7.0088E-03	-7.0091E-03	4.4521E-02	4.4522E-02	5.193E-02
CD-109	#A	1.0912E+00	1.0962E+00	1.8950E+00	1.8960E+00	2.070E+00
SN-113	#B	-1.9592E-02	-1.9950E-02	6.2859E-02	6.2869E-02	6.918E-02
SB-125	#B	-2.3235E-02	-2.3283E-02	1.7275E-01	1.7276E-01	1.535E-01
I-131	#B	0.0000E+00	0.0000E+00	5.8913E-02	5.8913E-02	5.237E-02
CS-134	#B	1.7803E-04	1.7853E-04	4.2237E-02	4.2237E-02	4.959E-02
CS-137	#A	1.1658E-02	1.1660E-02	4.2640E-02	4.2645E-02	4.889E-02
CE-139	#A	-1.4618E-02	-1.4842E-02	5.2047E-02	5.2053E-02	5.529E-02
EU-152	#B	1.8447E-02	1.8456E-02	1.4721E-01	1.4722E-01	1.646E-01
EU-154	#B	-1.8217E-02	-1.8229E-02	1.0771E-01	1.0771E-01	1.175E-01
EU-155	#B	1.1006E-02	1.1019E-02	1.9775E-01	1.9776E-01	2.215E-01
HG-203	#B	-5.2297E-03	-5.4693E-03	4.9573E-02	4.9574E-02	5.231E-02
TL-208		3.0816E-01	3.0816E-01	9.0915E-02	9.2545E-02	
PB-212	#	6.8646E-01	6.8646E-01	1.2620E-01	1.3195E-01	1.028E-01
PB-214	#	3.8400E-01	3.8400E-01	1.1881E-01	1.2075E-01	1.006E-01
BI-212		8.8457E-01	8.8457E-01	6.6033E-01	6.6220E-01	
BI-214		4.2731E-01	4.2731E-01	1.4588E-01	1.4784E-01	
RA-224	#A	3.5716E-01	3.5716E-01	1.1743E+00	1.1745E+00	1.306E+00
RA-226	#A	9.9534E-01	9.9535E-01	1.2131E+00	1.2143E+00	1.317E+00
AC-228		7.6038E-01	7.6038E-01	2.1318E-01	2.1741E-01	
TH-227	#B	-2.8446E-01	-2.8446E-01	4.3289E-01	4.3319E-01	4.688E-01
PA-234	#B	4.3444E-02	4.3444E-02	2.3347E-01	2.3349E-01	2.599E-01
TH-234	#B	7.3092E-01	7.3092E-01	4.1169E+00	4.1171E+00	4.589E+00
AM-241	#A	1.0422E-02	1.0422E-02	6.1164E-01	6.1164E-01	6.861E-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) 1.8309345E+01 pCi/gm
Total Decayed Activity (50.2 to 1999.0 keV) 1.8309345E+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: 103_10JUN2006_1433.An1

Sample description
OOL-10-03-003-C

Spectrum Filename: C:\GammaVision\Spectra\103_10JUN2006_1433.An1

Acquisition information
Start time: 10-Jun-2006 14:33:25
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: 1.6470E+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%
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-Jun-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. 14 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.6427

***** 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
74.99	99.	26.39	0.99	9.052E-03	74.81	9.600	9.323E-01	PB212
77.29	162.	13.14	0.99	1.011E-02	77.11	10.700	1.254E+00	PB214
					77.11	17.500	7.669E-01	PB212
84.37	70.	31.38	0.49	1.327E-02				
93.24	110.	31.49	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
186.52	123.	20.50	1.08	2.565E-02	185.99	3.280	PBC<MDA	RA226
209.90	75.	35.20	0.91	2.468E-02				
239.04	896.	4.04	1.09	2.318E-02	238.63	43.100	7.256E-01	PB212
241.94	107.	24.18	1.10	2.303E-02	241.00	3.900	9.770E-01	RA224
					241.92	7.470	5.112E-01	PB214
270.70	76.	29.55	1.97	2.149E-02				
295.56	199.	12.08	1.13	2.023E-02	295.22	19.200	4.119E-01	PB214
301.00	55.	40.76	1.41	1.997E-02				
328.73	45.	40.67	1.19	1.871E-02				
338.89	239.	12.62	1.34	1.828E-02	338.40	12.010	8.888E-01	AC228
352.40	352.	8.40	1.01	1.774E-02	351.99	37.100	4.317E-01	PB214
463.49	70.	20.90	1.32	1.425E-02				
463.49	70.	20.90	1.32	1.425E-02	463.51	10.000	3.958E-01	SB125
511.50	116.	14.42	1.26	1.316E-02	510.72	22.500	2.474E-01	TL208
584.08	298.	9.13	1.25	1.183E-02	583.14	86.000	2.362E-01	TL208
610.22	284.	8.03	1.37	1.143E-02	609.32	46.090	4.324E-01	BI214
728.55	124.	17.16	1.58	9.950E-03	727.17	11.800	8.632E-01	BI212
796.46	47.	34.63	1.36	9.295E-03	795.76	85.400	4.815E-02	CS134
861.41	74.	23.13	1.42	8.761E-03				
912.33	243.	8.61	1.71	8.393E-03	911.07	29.000	8.084E-01	AC228

965.89	40.	27.05	1.54	8.045E-03				
970.43	135.	10.88	1.54	8.017E-03	968.90	17.460	7.887E-01	AC228
1121.89	79.	20.96	1.10	7.204E-03	1120.28	15.040	5.833E-01	BI214
1462.90	1068.	3.11	1.76	5.926E-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	209.90	311.	75.	0.038	105.60	0.906	NP-239	
540.56	270.70	206.	76.	0.038	88.64	1.968	AC-228	s
601.14	301.00	198.	55.	0.028	122.28	1.406	PB-212	s
656.61	328.73	145.	45.	0.023	122.02	1.190	LA-140	
1721.87	861.41	65.	74.	0.037	69.39	1.420	TL-208	s
1930.88	965.76	38.	40.	0.020	79.99	1.539	TB-160	D
1939.96	970.30	48.	127.	0.064	35.24	1.542	AC-228	D
2924.67	1462.90	15.	1061.	0.530	9.35	1.758	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	148.79	74.81	313.	99.	0.049	79.17	0.993D
PB-212	153.39	77.11	318.	162.	0.081	39.41	0.995A
TH-234	185.66	93.24	762.	110.	0.055	94.47	1.500
RA-226	372.15	186.49	541.	121.	0.060	77.50	1.500
TH-227	472.46	236.65	899.	-122.	-0.061	107.91	1.500s
PB-212	477.29	239.07	475.	918.	0.459	14.75	1.112
RA-224	482.75	241.80	630.	94.	0.047	117.59	1.500s
PB-214	590.28	295.56	177.	195.	0.098	36.25	1.132s
AC-228	676.93	338.89	233.	238.	0.119	37.86	1.343
PB-214	703.94	352.40	199.	347.	0.173	25.20	1.013s
SB-125	926.48	463.68	99.	81.	0.041	60.67	1.500
TL-208	1020.55	510.72	141.	49.	0.024	69.62	1.259D
TL-208	1167.27	584.08	138.	293.	0.147	27.38	1.248
BI-214	1219.53	610.22	88.	278.	0.139	24.09	1.372
BI-212	1456.12	728.52	92.	114.	0.057	55.96	1.559s
CS-134	1590.81	795.88	46.	39.	0.019	88.03	1.500s
AC-228	1823.69	912.33	61.	240.	0.120	25.83	1.714s
AC-228	1936.81	968.90	28.	130.	0.065	31.50	1.541D
BI-214	2243.27	1122.15	43.	70.	0.035	51.79	1.634

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		1.0247E-03					
			477.56	1.025E-03	%(	2.459E-01	6.99E-02 G
K-40		-1.4047E-01					
			1460.75	-1.405E-01	%(P	6.302E-01	1.66E-01 G
MN-54		-1.9542E-04					
			834.81	-1.954E-04	%(P	2.990E-02	8.29E-03 G
CO-57		9.2907E-03					
			122.07	9.291E-03	%(P	5.186E-02	1.55E-02 G K
			136.43	-4.691E-03	%	3.965E-01	1.18E-01 G
CO-60		-8.4012E-03					
			1332.51	-8.401E-03	&(P	4.203E-02	1.16E-02 G K
			1173.23	1.307E-03	& P	4.960E-02	1.40E-02 G K
Sr-85		-1.2706E-02					
			514.00	-1.271E-02	%(	4.532E-02	1.35E-02 G
Kr-85		-2.9318E+02					
			513.99	-2.932E+02	%(	1.046E+03	3.12E+02 G
Y-88		-3.2490E-04					
			1836.01	-3.249E-04	&(P	2.706E-02	6.85E-03 G K
			898.02	-3.058E-05	% P	2.841E-02	7.73E-03 G
NB-94		1.5748E-04					
			871.10	1.575E-04	&(	2.879E-02	7.97E-03 G K
			702.50	3.011E-03	&	3.681E-02	1.06E-02 G K
Ag-108M		3.8529E-04					
			722.95	3.853E-04	%(	2.358E-02	6.44E-03 G K
			614.37	-1.408E-02	% P	4.510E-02	1.34E-02 G
			433.93	4.421E-05	&	3.160E-02	9.09E-03 G
CD-109		7.8859E-01					
			88.04	7.886E-01	&(	1.969E+00	5.95E-01 G
SN-113		-6.4586E-04					
			391.71	-6.459E-04	%(	4.262E-02	1.23E-02 G K
			255.04	-1.794E-01	%	1.575E+00	4.67E-01 G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	1.0333E-01						
		427.95	-1.966E-02	%(P	1.160E-01	3.42E-02	G K
		600.77	-1.998E-03	% P	2.086E-01	6.02E-02	G
		636.15	-2.224E-02	& P	3.093E-01	8.88E-02	G
		463.51	4.674E-01	(P	2.827E-01	9.60E-02	G
		176.29	3.820E-02	&	5.201E-01	1.54E-01	G
I-131	-1.0920E-02						
		364.48	-1.092E-02	%(P	4.185E-02	1.24E-02	G K
		636.97	-4.108E-02	&	4.927E-01	1.43E-01	G
		284.29	-7.667E-02	% P	5.677E-01	1.68E-01	G
CS-134	1.8691E-02						
		604.66	0.000E+00	%(	4.430E-02	1.28E-02	G K
		795.76	4.005E-02	*(P	3.533E-02	1.18E-02	G
		569.29	9.569E-03	% P	2.292E-01	6.60E-02	G
		801.84	-8.378E-02	% P	4.359E-01	1.25E-01	G
CS-137	1.1973E-02						
		661.62	1.197E-02	%(P	3.420E-02	1.01E-02	G
CE-139	-1.2781E-04						
		165.85	-1.278E-04	%(	4.823E-02	1.43E-02	G
EU-152	4.5437E-04						
		121.78	4.544E-04	%(P	1.103E-01	3.25E-02	G K
		344.30	-1.318E-02	& P	1.223E-01	3.60E-02	G
		1408.08	3.193E-03	%	1.395E-01	3.74E-02	G
		964.00	5.448E-02	% P	2.642E-01	7.68E-02	G
		1112.07	8.062E-02	%	3.290E-01	9.65E-02	G
		778.90	-6.758E-02	%	2.893E-01	8.50E-02	G
EU-154	1.6255E-02						
		123.10	1.626E-02	%(	1.068E-01	3.19E-02	G K
		1274.80	-4.586E-04	%	7.437E-02	1.97E-02	G
		723.30	-1.768E-02	%	1.700E-01	4.89E-02	G
		1004.80	-3.894E-02	&	2.336E-01	6.77E-02	G
EU-155	5.3562E-02						
		86.45	5.356E-02	&(	2.414E-01	7.25E-02	G K
		105.31	2.577E-02	%	2.392E-01	7.14E-02	G
HG-203	-1.2032E-03						
		279.17	-1.203E-03	%(P	4.356E-02	1.28E-02	G K
		72.87	-3.841E-01	% P	2.315E+00	6.94E-01	G
		70.83	-7.919E-01	%	4.234E+00	1.27E+00	G
		82.50	-1.542E+00	%	4.060E+00	1.23E+00	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	2.3624E-01						
		583.14	2.362E-01	(P	4.623E-02	2.19E-02	G
		510.72	1.344E-01	- P	1.609E-01	4.83E-02	G
PB-212	7.5697E-01						
		238.63	7.529E-01	(P	8.561E-02	3.76E-02	G K
							Energy duplication
		77.11	7.532E-01	} P	3.975E-01	9.89E-02	G
		74.81	9.323E-01	+ P	8.044E-01	2.54E-01	G
PB-214	4.2495E-01						
		351.99	4.317E-01	@(P	8.536E-02	3.69E-02	G K
		295.22	4.119E-01	@(P	1.365E-01	5.08E-02	G
							Energy duplication
		77.11	0.000E+00	} P	9.845E-01	0.00E+00	G
		241.92	2.866E-01	%	5.947E-01	1.80E-01	G
BI-212	7.9343E-01						
		727.17	7.934E-01	@(P	3.313E-01	1.49E-01	G K
		1620.56	-1.694E-01	& P	1.152E+00	3.19E-01	G
		785.42	3.121E-01	%	1.888E+00	5.50E-01	G
BI-214	4.5654E-01						
		609.32	4.324E-01	(P	7.231E-02	3.56E-02	G K
		1764.51	-5.438E-02	% P	2.074E-01	5.05E-02	G
		1120.28	5.306E-01	(P	2.522E-01	9.41E-02	G
RA-224	8.5574E-01						
		241.00	8.557E-01	?(	1.091E+00	3.35E-01	G
RA-226	1.1752E+00						
		185.99	1.175E+00	(P	1.083E+00	3.36E-01	G
AC-228	8.1044E-01						
		911.07	8.084E-01	@(P	1.317E-01	7.07E-02	G K
		968.90	7.600E-01	(P	1.609E-01	7.99E-02	G
		338.40	8.888E-01	(P	2.756E-01	1.13E-01	G
TH-227	-3.8239E-01						
		236.00	-3.824E-01	?(	4.471E-01	1.38E-01	G K
		256.25	-7.253E-02	& P	3.544E-01	1.05E-01	G
PA-234	-1.6526E-02						
		98.44	-1.653E-02	&(P	2.180E-01	6.48E-02	G K
		946.00	-3.836E-02	% P	2.175E-01	6.34E-02	G
		131.28	-4.473E-04	& P	2.242E-01	6.66E-02	G
		94.67	7.853E-04	% P	3.471E-01	1.03E-01	G
		883.24	1.974E-03	%	2.759E-01	7.73E-02	G
		926.70	-3.324E-03	%	3.312E-01	9.33E-02	G

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 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26 2.445E-02 % P 3.296E-01 9.51E-02 G

TH-234       9.2869E-01
                           63.29 2.361E-01 &(P 6.693E+00 1.98E+00 G K
                           92.80 1.829E+00  (P 2.184E+00 6.68E-01 G
                           92.38-3.663E-01 & P 2.623E+00 7.71E-01 G

AM-241       3.0145E-03
                           59.54 3.015E-03 &(P 1.143E+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	1.0238E-03	1.0247E-03	2.0985E-01	2.0985E-01	2.457E-01
K-40	#A	-1.4047E-01	-1.4047E-01	1.8803E+00	1.8804E+00	6.302E-01
MN-54	#A	-1.9539E-04	-1.9542E-04	9.8588E-02	9.8588E-02	2.990E-02
CO-57	#B	9.2891E-03	9.2907E-03	4.6572E-02	4.6575E-02	5.185E-02
CO-60	#B	-8.4010E-03	-8.4012E-03	8.2533E-02	8.2534E-02	4.203E-02

Sr-85	#A	-1.2698E-02	-1.2706E-02	4.0604E-02	4.0611E-02	4.529E-02
Kr-85	#A	-2.9318E+02	-2.9318E+02	9.3673E+02	9.3688E+02	1.046E+03
Y-88	#B	-3.2477E-04	-3.2490E-04	3.9992E-02	3.9992E-02	2.704E-02
NB-94	#B	1.5748E-04	1.5748E-04	2.3911E-02	2.3911E-02	2.879E-02
Ag-108M	#B	3.8528E-04	3.8529E-04	1.9315E-02	1.9315E-02	2.358E-02
CD-109	#A	7.8852E-01	7.8859E-01	1.7855E+00	1.7861E+00	1.968E+00
SN-113	#B	-6.4560E-04	-6.4586E-04	3.6931E-02	3.6931E-02	4.260E-02
SB-125	#B	1.0332E-01	1.0333E-01	6.3677E-02	6.3959E-02	1.160E-01
I-131	#B	-1.0859E-02	-1.0920E-02	4.0206E-02	4.0211E-02	4.162E-02
CS-134	#B	1.8690E-02	1.8691E-02	1.6490E-02	1.6526E-02	4.429E-02
CS-137	#A	1.1973E-02	1.1973E-02	3.0377E-02	3.0385E-02	3.420E-02
CE-139	#A	-1.2777E-04	-1.2781E-04	4.2946E-02	4.2946E-02	4.822E-02
EU-152	#B	4.5437E-04	4.5437E-04	9.7446E-02	9.7446E-02	1.103E-01
EU-154	#B	1.6255E-02	1.6255E-02	9.5793E-02	9.5798E-02	1.068E-01
EU-155	#B	5.3561E-02	5.3562E-02	2.1736E-01	2.1739E-01	2.414E-01
HG-203	#B	-1.2021E-03	-1.2032E-03	3.9747E-02	3.9747E-02	4.352E-02
TL-208		2.3624E-01	2.3624E-01	6.5637E-02	6.7055E-02	
PB-212		7.5697E-01	7.5697E-01	1.1310E-01	1.2134E-01	
PB-214	#	4.2495E-01	4.2495E-01	9.5620E-02	9.8751E-02	
BI-212	#	7.9343E-01	7.9343E-01	4.4597E-01	4.4835E-01	
BI-214		4.5654E-01	4.5654E-01	1.1255E-01	1.1563E-01	
RA-224	#A	8.5574E-01	8.5574E-01	1.0063E+00	1.0075E+00	1.091E+00
RA-226	#	1.1752E+00	1.1752E+00	1.0087E+00	1.0110E+00	1.083E+00
AC-228		8.1044E-01	8.1044E-01	1.5107E-01	1.5823E-01	
TH-227	#A	-3.8239E-01	-3.8239E-01	4.1261E-01	4.1321E-01	4.471E-01
PA-234	#B	-1.6526E-02	-1.6526E-02	2.4122E-01	2.4122E-01	2.180E-01
TH-234	#B	9.2869E-01	9.2869E-01	1.0181E+00	1.0194E+00	6.693E+00
AM-241	#A	3.0145E-03	3.0145E-03	1.0162E+00	1.0162E+00	1.143E+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 (1121.5 to 2000.7 keV) 3.4785690E+00 pCi/gm
Total Decayed Activity (1121.5 to 2000.7 keV) 3.4785690E+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_5JULY2006_1153.An1

Sample description
FSS-OOL-10-03-018-F-RC

Spectrum Filename: C:\GammaVision\Spectra\103F_5JULY2006_1153.An1

Acquisition information

Start time:	05-Jul-2006 11:53:27
Live time:	2000
Real time:	2002
Dead time:	0.12 %
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:	2.1860E+03
Activity scaling factor:	1.0000E+06/(1.0000E+00* 2.1860E+03) = 4.5746E+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	26-Jun-2006 14:56:00
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: 0.1542

***** 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
74.89	91.	32.95	0.99	9.052E-03	74.81	9.600	PBC<MDA	PB212
77.07	249.	18.48	0.99	1.009E-02	77.11	17.500	8.585E-01	PB212
					77.11	10.700	1.404E+00	PB214
93.09	102.	39.29	1.50	1.645E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
129.42	107.	40.66	1.00	2.441E-02				
185.93	217.	19.16	1.23	2.567E-02	185.99	3.280	1.498E+00	RA226
209.27	104.	28.88	1.32	2.471E-02				
238.78	1264.	3.31	1.09	2.320E-02	238.63	43.100	7.740E-01	PB212
241.87	172.	16.52	1.10	2.303E-02	241.00	3.900	1.182E+00	RA224
					241.92	7.470	6.187E-01	PB214
270.25	67.	40.03	1.28	2.151E-02				
277.60	73.	27.78	1.08	2.113E-02				
295.21	334.	10.62	1.32	2.025E-02	295.22	19.200	5.243E-01	PB214
300.10	95.	24.71	1.00	2.001E-02				
328.34	77.	27.86	1.27	1.873E-02				
338.48	254.	12.78	0.91	1.830E-02	338.40	12.010	7.127E-01	AC228
352.01	606.	6.54	1.19	1.775E-02	351.99	37.100	5.635E-01	PB214
463.19	82.	29.40	0.96	1.425E-02				
463.19	82.	29.40	0.96	1.425E-02	463.51	10.000	3.507E-01	SB125
511.04	204.	14.75	1.18	1.317E-02	510.72	22.500	3.699E-01	TL208
583.33	400.	7.12	1.33	1.184E-02	583.14	86.000	2.404E-01	TL208
609.51	419.	8.01	1.32	1.144E-02	609.32	46.090	4.840E-01	BI214
727.39	89.	22.67	1.70	9.962E-03	727.17	11.800	4.653E-01	BI212
794.85	64.	28.56	1.55	9.309E-03				
794.85	64.	28.56	1.55	9.309E-03	795.76	85.400	5.015E-02	CS134
838.49	62.	26.65	1.04	8.940E-03				

911.57	285.	8.51	1.42	8.398E-03	911.07	29.000	7.146E-01	AC228
934.12	33.	35.75	0.93	8.246E-03				
964.76	46.	24.62	1.54	8.051E-03				
969.31	177.	9.23	1.54	8.023E-03	968.90	17.460	7.810E-01	AC228
1120.47	103.	17.06	2.20	7.211E-03	1120.28	15.040	5.774E-01	BI214
1238.88	60.	29.44	1.45	6.699E-03				
1408.51	18.	41.66	1.81	6.096E-03	1408.08	21.210	PBC<MDA	EU152
1461.26	1425.	2.71	1.96	5.930E-03	1460.75	10.700	1.369E+01	K40
1620.24	24.	37.62	2.02	5.488E-03	1620.56	2.750	9.977E-01	BI212
1765.16	77.	12.43	1.80	5.140E-03	1764.51	15.920	5.545E-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	
258.01	129.42	763.	127.	0.064	95.65	0.998	AC-228	s
417.69	209.27	399.	104.	0.052	86.63	1.322	AC-228	s
539.65	270.25	315.	67.	0.034	120.10	1.279	AC-228	
599.35	300.10	228.	95.	0.047	74.13	1.004	PB-212	
655.82	328.34	180.	77.	0.038	83.58	1.270	RH-106M	
1588.75	794.85	93.	61.	0.030	77.61	1.552	AC-228	
1676.04	838.49	66.	68.	0.034	62.39	1.042	J-135	s
1867.26	934.12	47.	33.	0.017	107.24	0.934	BI-214	s
1929.26	964.75	40.	47.	0.023	72.53	1.538	AC-228	D
2476.70	1238.88	84.	60.	0.030	88.32	1.448	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	435.	91.	0.045	98.86	0.993D
PB-212	153.39	77.11	393.	222.	0.111	2.83	0.995A
RA-226	371.02	185.93	643.	204.	0.102	57.49	1.232s
PB-212	476.42	238.63	255.	1254.	0.627	9.92	1.093D
PB-214	483.00	241.92	395.	153.	0.077	52.05	1.095A
PB-214	589.57	295.21	359.	330.	0.165	31.87	1.320s
AC-228	676.11	338.48	299.	253.	0.127	38.34	0.914s
PB-214	703.16	352.01	328.	600.	0.300	19.63	1.191
SB-125	925.33	463.10	170.	65.	0.033	90.93	1.500
TL-208	1021.19	511.04	222.	177.	0.089	44.26	1.183s
TL-208	1165.75	583.33	147.	396.	0.198	21.37	1.329
BI-214	1218.12	609.51	198.	413.	0.206	24.04	1.323
Ag-108M	1222.95	611.93	201.	-58.	-0.029	110.51	1.500s
BI-212	1453.84	727.39	106.	89.	0.044	68.00	1.695s
AC-228	1822.17	911.57	95.	282.	0.141	25.54	1.415s
AC-228	1936.81	968.90	41.	177.	0.089	27.24	1.541D
BI-214	2239.90	1120.47	76.	101.	0.051	51.17	2.202s
EU-152	2815.91	1408.51	20.	18.	0.009	124.99	1.812s
K-40	2921.38	1461.26	38.	1406.	0.703	8.13	1.958
BI-212	3239.30	1620.24	14.	24.	0.012	112.85	2.019

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
BI-214	3529.08	1765.16	7.	73.	0.037	37.29	1.796

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		7.4375E-02					
			477.56	7.437E-02	&(	3.278E-01 9.74E-02	G
K-40		1.3694E+01					
			1460.75	1.369E+01	(P	3.059E-01 3.76E-01	G
MN-54		-8.0342E-03					
			834.81	-8.034E-03	&(P	3.252E-02 9.56E-03	G
CO-57		-3.1133E-03					
			122.07	-3.113E-03	%(P	4.497E-02 1.34E-02	G K
			136.43	1.297E-01	%	3.408E-01 1.03E-01	G
CO-60		1.0128E-02					
			1332.51	1.013E-02	%(P	3.560E-02 1.04E-02	G K
			1173.23	3.610E-03	& P	4.420E-02 1.27E-02	G K
Sr-85		-9.1197E-03					
			514.00	-9.120E-03	%(	3.817E-02 1.14E-02	G
Kr-85		-1.9177E+02					
			513.99	-1.918E+02	%(	8.016E+02 2.39E+02	G
Y-88		-8.3256E-05					
			1836.01	-8.326E-05	&(P	3.479E-02 9.46E-03	G K
			898.02	5.623E-03	% P	3.225E-02 9.34E-03	G
NB-94		-7.5743E-04					
			871.10	-7.574E-04	%(	3.585E-02 1.03E-02	G K
			702.50	-1.243E-02	%	3.496E-02 1.05E-02	G K
Ag-108M		1.3530E-02					
			722.95	1.353E-02	%(	2.963E-02 8.96E-03	G K
			614.37	-3.508E-02	- P	4.136E-02 1.29E-02	G
			433.93	3.761E-03	%	2.795E-02 8.21E-03	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CD-109	1.2250E-02						
		88.04	1.225E-02	%(	1.632E+00	4.86E-01	G
SN-113	-5.3927E-05						
		391.71	-5.393E-05	&(	4.335E-02	1.26E-02	G K
		255.04	2.893E-01	&	1.502E+00	4.49E-01	G
SB-125	7.0970E-02						
		427.95	-1.031E-03	%(P	8.230E-02	2.39E-02	G K
		600.77	-2.526E-02	% P	1.608E-01	4.72E-02	G
		636.15	2.624E-02	% P	2.611E-01	7.59E-02	G
		463.51	2.841E-01	(P	2.773E-01	8.78E-02	G
		176.29	-1.422E-01	%	5.406E-01	1.63E-01	G
I-131	-7.0215E-03						
		364.48	-7.021E-03	&(P	7.473E-02	2.20E-02	G K
		636.97	9.106E-02	%	8.089E-01	2.35E-01	G
		284.29	1.857E-01	& P	9.914E-01	2.95E-01	G
CS-134	-1.1611E-02						
		604.66	-1.161E-02	%(	3.708E-02	1.11E-02	G K
		795.76	2.437E-03	% P	4.147E-02	1.20E-02	G
		569.29	3.990E-03	& P	1.625E-01	4.65E-02	G
		801.84	7.088E-02	& P	3.693E-01	1.08E-01	G
CS-137	2.2490E-02						
		661.62	2.249E-02	%(P	3.725E-02	1.14E-02	G
CE-139	-8.7437E-03						
		165.85	-8.744E-03	%(	4.509E-02	1.35E-02	G
EU-152	2.7246E-02						
		121.78	-1.686E-02	%(P	1.337E-01	4.00E-02	G K
		344.30	1.235E-03	& P	1.044E-01	3.07E-02	G
		1408.08	8.805E-02	*(	1.131E-01	3.67E-02	G
		964.00	7.165E-02	% P	2.394E-01	7.09E-02	G
		1112.07	1.282E-01	%	2.696E-01	8.17E-02	G
		778.90	-2.142E-02	%	2.037E-01	5.86E-02	G
EU-154	3.4484E-03						
		123.10	3.448E-03	%(	9.756E-02	2.91E-02	G K
		1274.80	1.884E-02	%	8.793E-02	2.55E-02	G
		723.30	0.000E+00	%	2.650E-01	7.78E-02	G
		1004.80	-2.576E-02	%	1.905E-01	5.52E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
EU-155	-1.3928E-02						
		86.45	-1.393E-02	%(	1.739E-01	5.18E-02	G K
		105.31	7.174E-02	%	2.084E-01	6.29E-02	G
HG-203	-1.0500E-02						
		279.17	-1.050E-02	&(P	4.185E-02	1.25E-02	G K
		72.87	-2.599E-01	% P	2.019E+00	6.04E-01	G
		70.83	1.906E-01	&	4.235E+00	1.26E+00	G
		82.50	5.368E-02	&	4.055E+00	1.21E+00	G
TL-208	2.4044E-01						
		583.14	2.404E-01	(P	3.591E-02	1.73E-02	G
		510.72	3.699E-01	+ P	1.504E-01	6.28E-02	G
PB-212	7.7517E-01						
		238.63	7.755E-01	(P	4.770E-02	2.59E-02	G K
							Energy duplication
		77.11	7.752E-01	} P	3.322E-01	7.31E-03	G
		74.81	6.462E-01	- P	7.108E-01	2.20E-01	G
PB-214	5.5014E-01						
		351.99	5.635E-01	(P	8.171E-02	3.72E-02	G K
		295.22	5.243E-01	@(P	1.448E-01	5.64E-02	G
							Energy duplication
		77.11	0.000E+00	} P	8.629E-01	0.00E+00	G
		241.92	5.501E-01	}	3.427E-01	9.54E-02	G
BI-212	4.6531E-01						
		727.17	4.653E-01	(P	2.671E-01	1.06E-01	G K
		1620.56	9.977E-01	+ P	8.161E-01	3.76E-01	G
		785.42	9.646E-01	%	1.307E+00	4.10E-01	G
BI-214	5.1683E-01						
		609.32	4.840E-01	(P	8.009E-02	3.94E-02	G K
		1764.51	5.545E-01	(P	1.107E-01	7.20E-02	G
		1120.28	5.774E-01	(P	2.465E-01	1.00E-01	G
RA-224	6.9315E-01						
							Derived Ave Activity
		241.00	6.932E-01	}(	1.088E+00	3.46E-01	G
RA-226	1.4983E+00						
		185.99	1.498E+00	@(P	8.876E-01	3.05E-01	G
AC-228	7.3405E-01						
		911.07	7.146E-01	@(P	1.223E-01	6.16E-02	G K
		968.90	7.810E-01	(P	1.435E-01	7.10E-02	G
		338.40	7.127E-01	@(P	2.341E-01	9.15E-02	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments

TH-227      -5.0346E-03
                          236.00-5.035E-03 %(  4.067E-01 1.22E-01 G K
                          256.25 8.368E-02 % P 4.350E-01 1.30E-01 G

PA-234       4.3442E-02
                           98.44 4.344E-02 %(P 2.005E-01 6.02E-02 G K
                          946.00-2.331E-03 % P 1.780E-01 5.10E-02 G
                          131.28-4.886E-02 & P 1.911E-01 5.75E-02 G
                           94.67-1.493E-01 % P 3.824E-01 1.16E-01 G
                          883.24 5.488E-03 %   2.749E-01 7.87E-02 G
                          926.70-2.024E-02 &   2.916E-01 8.37E-02 G
                          569.26 6.215E-03 & P 2.391E-01 6.84E-02 G

TH-234       1.2893E+00
                           63.29 1.289E+00 %(P 5.912E+00 1.77E+00 G K
                           92.80 1.281E+00 % P 1.941E+00 5.90E-01 G
                           92.38 1.278E+00 % P 2.317E+00 7.02E-01 G

AM-241       2.9607E-01
                           59.54 2.961E-01 %(P 9.310E-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:	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	6.6283E-02	7.4375E-02	2.9211E-01	2.9215E-01	2.922E-01
K-40		1.3694E+01	1.3694E+01	1.1279E+00	1.3799E+00	
MN-54	#A	-7.8774E-03	-8.0342E-03	3.0543E-02	3.0547E-02	3.189E-02
CO-57	#B	-3.0432E-03	-3.1133E-03	4.3932E-02	4.3933E-02	4.396E-02
CO-60	#B	1.0096E-02	1.0128E-02	3.1088E-02	3.1094E-02	3.549E-02
Sr-85	#A	-8.2944E-03	-9.1197E-03	3.4101E-02	3.4106E-02	3.472E-02
Kr-85	#A	-1.9176E+02	-1.9177E+02	7.1612E+02	7.1621E+02	8.016E+02
Y-88	#B	-7.8588E-05	-8.3256E-05	3.5736E-03	3.5736E-03	3.284E-02
NB-94	#B	-7.5743E-04	-7.5743E-04	3.0961E-02	3.0961E-02	3.585E-02
Ag-108M	#B	1.3528E-02	1.3530E-02	2.6882E-02	2.6893E-02	2.962E-02
CD-109	#A	1.2085E-02	1.2250E-02	1.4588E+00	1.4588E+00	1.610E+00
SN-113	#B	-5.1121E-05	-5.3927E-05	3.7938E-02	3.7938E-02	4.110E-02
SB-125	#B	7.0539E-02	7.0970E-02	6.5800E-02	6.5929E-02	8.180E-02
I-131	#B	-3.2674E-03	-7.0215E-03	7.9453E-02	7.9454E-02	3.478E-02
CS-134	#B	-1.1516E-02	-1.1611E-02	3.3272E-02	3.3279E-02	3.678E-02
CS-137	#A	2.2478E-02	2.2490E-02	3.4222E-02	3.4247E-02	3.723E-02
CE-139	#A	-8.3612E-03	-8.7437E-03	4.0592E-02	4.0595E-02	4.312E-02
EU-152	#B	2.7210E-02	2.7246E-02	3.4054E-02	3.4087E-02	1.336E-01
EU-154	#B	3.4416E-03	3.4484E-03	8.7342E-02	8.7342E-02	9.737E-02
EU-155	#B	-1.3881E-02	-1.3928E-02	1.5554E-01	1.5554E-01	1.733E-01
HG-203	#B	-9.2013E-03	-1.0500E-02	3.7719E-02	3.7724E-02	3.667E-02
TL-208		2.4044E-01	2.4044E-01	5.1935E-02	5.3778E-02	
PB-212		7.7517E-01	7.7517E-01	7.7621E-02	8.9724E-02	
PB-214		5.5014E-01	5.5014E-01	1.0414E-01	1.0892E-01	
BI-212		4.6531E-01	4.6531E-01	3.1819E-01	3.1934E-01	
BI-214		5.1683E-01	5.1683E-01	1.1973E-01	1.2343E-01	
RA-224	A	6.9315E-01	6.9315E-01	1.0088E+00	1.0096E+00	
RA-226	#	1.4983E+00	1.4983E+00	9.1601E-01	9.2013E-01	
AC-228		7.3405E-01	7.3405E-01	1.3162E-01	1.3835E-01	
TH-227	#B	-5.0346E-03	-5.0346E-03	3.6454E-01	3.6454E-01	4.067E-01
PA-234	#B	4.3442E-02	4.3442E-02	1.8067E-01	1.8068E-01	2.005E-01
TH-234	#B	1.2893E+00	1.2893E+00	5.3158E+00	5.3163E+00	5.912E+00
AM-241	#A	2.9606E-01	2.9607E-01	8.4097E-01	8.4113E-01	9.310E-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: 103F_5JULY2006_1153.An1

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

Total Activity (1120.0 to 2000.7 keV) 1.9167784E+01 pCi/gm
Total Decayed Activity (1120.0 to 2000.7 keV) 1.9167799E+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_6JULY2006_0808.An1

Sample description
FSS-OOL-10-03-005-F

Spectrum Filename: C:\GammaVision\Spectra\103F_6JULY2006_0808.An1

Acquisition information
Start time: 06-Jul-2006 08:08:34
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: 2.2140E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 2.2140E+03) =
4.5167E+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	26-Jun-2006 16:18:00
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: 0.1419

***** 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	120.	23.47	0.99	9.052E-03	74.81	9.600	8.402E-01	PB212
77.19	177.	13.59	0.99	1.011E-02	77.11	17.500	7.238E-01	PB212
					77.11	10.700	1.184E+00	PB214
92.99	90.	41.56	1.50	1.645E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
93.00	91.	41.65	1.50	1.631E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
186.35	166.	23.88	1.45	2.566E-02	185.99	3.280	1.113E+00	RA226
209.54	103.	34.50	0.92	2.470E-02				
239.09	1291.	4.53	1.10	2.317E-02	238.63	43.100	7.809E-01	PB212
270.41	116.	28.12	1.45	2.150E-02				
295.22	223.	14.85	0.94	2.025E-02	295.22	19.200	3.437E-01	PB214
300.58	68.	40.39	0.93	1.999E-02				
327.17	100.	27.87	1.17	1.878E-02				
338.55	212.	12.24	0.91	1.829E-02	338.40	12.010	5.851E-01	AC228
352.03	394.	8.58	1.17	1.775E-02	351.99	37.100	3.599E-01	PB214
409.44	76.	28.57	1.23	1.575E-02				
463.72	88.	27.18	0.86	1.424E-02	463.51	10.000	3.757E-01	SB125
510.98	177.	16.36	1.86	1.317E-02	510.72	22.500	3.094E-01	TL208
583.29	375.	6.94	1.35	1.184E-02	583.14	86.000	2.221E-01	TL208
609.39	282.	9.77	1.10	1.144E-02	609.32	46.090	3.191E-01	BI214
726.68	113.	18.23	1.71	9.970E-03	727.17	11.800	5.850E-01	BI212
795.23	35.	37.08	1.50	9.301E-03	795.76	85.400	PBC<MDA	CS134
911.46	305.	10.16	1.64	8.399E-03	911.07	29.000	7.567E-01	AC228
964.64	51.	22.00	1.54	8.052E-03	964.00	14.580	2.600E-01	EU152
969.33	183.	8.57	1.54	8.023E-03	968.90	17.460	7.956E-01	AC228
1120.57	40.	37.82	1.63	7.212E-03	1120.28	15.040	PBC<MDA	BI214

1461.17	1335.	2.87	1.82	5.931E-03	1460.75	10.700	1.266E+01	K40
1765.23	54.	14.27	1.85	5.140E-03	1764.51	15.920	3.790E-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	
418.25	209.54	503.	103.	0.051	103.49	0.924	AC-228	
539.97	270.41	363.	116.	0.058	84.35	1.446	AC-228	s
600.31	300.58	284.	68.	0.034	121.17	0.928	PB-212	
653.49	327.17	259.	100.	0.050	83.61	1.175	AC-228	s
818.01	409.44	160.	76.	0.038	85.72	1.230	AC-228	
1929.20	964.69	34.	57.	0.029	58.63	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	356.	120.	0.060	70.40	0.993D
PB-212	153.39	77.11	362.	177.	0.088	40.77	0.995A
RA-226	371.65	186.24	699.	146.	0.073	73.86	1.500s
PB-212	476.78	238.81	774.	1061.	0.531	15.64	1.084
PB-214	589.58	295.22	340.	219.	0.109	44.55	0.939s
AC-228	676.24	338.55	201.	211.	0.105	36.73	0.907
PB-214	703.19	352.03	256.	388.	0.194	25.75	1.169
SB-125	925.26	463.07	179.	57.	0.028	104.90	1.500s
TL-208	1021.07	510.98	227.	150.	0.075	49.07	1.859s
TL-208	1165.68	583.29	112.	371.	0.185	20.82	1.348
BI-214	1218.06	609.48	124.	251.	0.126	25.86	1.500
BI-212	1452.43	726.68	101.	113.	0.056	54.68	1.706s
CS-134	1589.52	795.23	68.	35.	0.018	111.25	1.500
AC-228	1821.96	911.46	153.	302.	0.151	30.49	1.639
AC-228	1936.81	968.90	29.	183.	0.091	25.46	1.541D
BI-214	2240.11	1120.57	105.	40.	0.020	113.45	1.634s
K-40	2921.20	1461.17	48.	1316.	0.658	8.61	1.815
BI-214	3529.19	1765.22	7.	38.	0.019	51.47	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		2.5136E-02					
			477.56	2.514E-02	&(	2.494E-01 7.26E-02	G
K-40		1.2660E+01					
			1460.75	1.266E+01	(P	3.350E-01 3.68E-01	G
MN-54		4.9355E-03					
			834.81	4.936E-03	%(P	3.215E-02 9.36E-03	G
CO-57		-1.1090E-02					
			122.07	-1.109E-02	%(P	4.276E-02 1.29E-02	G K
			136.43	-2.873E-02	&	3.374E-01 1.01E-01	G
CO-60		-2.2504E-03					
			1332.51	-2.250E-03	&(P	3.060E-02 8.22E-03	G K
			1173.23	8.894E-04	& P	4.363E-02 1.25E-02	G K
Sr-85		-1.2534E-02					
			514.00	-1.253E-02	&(	4.090E-02 1.23E-02	G
Kr-85		-2.6105E+02					
			513.99	-2.611E+02	&(	8.516E+02 2.55E+02	G
Y-88		-4.4912E-04					
			1836.01	-4.491E-04	&(P	1.973E-02 4.93E-03	G K
			898.02	5.440E-03	% P	3.302E-02 9.56E-03	G
NB-94		-4.7787E-03					
			871.10	-4.779E-03	%(	2.992E-02 8.70E-03	G K
			702.50	6.295E-03	%	2.775E-02 8.17E-03	G K
Ag-108M		-3.5396E-03					
			722.95	-3.540E-03	%(	3.521E-02 1.02E-02	G K
			614.37	-5.409E-03	% P	3.302E-02 9.69E-03	G
			433.93	-3.160E-03	&	3.085E-02 9.07E-03	G
CD-109		2.5414E-02					
			88.04	2.541E-02	%(	1.746E+00 5.21E-01	G
SN-113		-2.3165E-03					
			391.71	-2.316E-03	&(	4.256E-02 1.25E-02	G K
			255.04	1.632E-01	%	1.432E+00 4.26E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	6.2936E-02						
		427.95	1.403E-03	%(P	9.671E-02	2.83E-02	G K
		600.77	3.230E-02	% P	1.471E-01	4.34E-02	G
		636.15	-9.159E-02	% P	2.850E-01	8.49E-02	G
		463.51	2.451E-01	*(P	2.803E-01	8.76E-02	G
		176.29	1.201E-02	&	4.764E-01	1.42E-01	G
I-131	1.3581E-02						
		364.48	1.358E-02	%(P	6.736E-02	1.99E-02	G K
		636.97	-1.861E-02	%	1.033E+00	3.00E-01	G
		284.29	-3.817E-01	% P	1.097E+00	3.30E-01	G
CS-134	8.6607E-03						
		604.66	-7.677E-03	%(	3.305E-02	9.80E-03	G K
		795.76	2.733E-02	(P	3.196E-02	1.02E-02	G
		569.29	1.701E-02	& P	1.931E-01	5.62E-02	G
		801.84	6.228E-02	% P	3.222E-01	9.36E-02	G
CS-137	9.4391E-03						
		661.62	9.439E-03	&(P	2.916E-02	8.63E-03	G
CE-139	3.4322E-03						
		165.85	3.432E-03	%(	3.934E-02	1.17E-02	G
EU-152	-1.1659E-03						
		121.78	-1.166E-03	%(P	1.192E-01	3.54E-02	G K
		344.30	8.361E-03	& P	9.732E-02	2.87E-02	G
		1408.08	2.452E-02	%	1.102E-01	3.15E-02	G
		964.00	8.939E-02	% P	2.402E-01	7.18E-02	G
		1112.07	5.267E-04	&	2.727E-01	7.77E-02	G
		778.90	5.298E-03	&	2.722E-01	7.87E-02	G
EU-154	6.8513E-03						
		123.10	6.851E-03	%(	9.075E-02	2.71E-02	G K
		1274.80	-3.325E-02	%	1.040E-01	3.09E-02	G
		723.30	-1.668E-02	%	1.634E-01	4.76E-02	G
		1004.80	-8.907E-04	%	1.630E-01	4.59E-02	G
EU-155	1.0426E-01						
		86.45	1.043E-01	%(	1.972E-01	5.99E-02	G K
		105.31	5.508E-02	%	2.008E-01	6.04E-02	G
HG-203	-4.7846E-03						
		279.17	-4.785E-03	&(P	3.967E-02	1.18E-02	G K
		72.87	9.811E-01	% P	1.553E+00	4.74E-01	G
		70.83	-5.519E-02	&	3.566E+00	1.06E+00	G
		82.50	-3.146E-01	&	3.540E+00	1.06E+00	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments

TL-208       2.2212E-01
                          583.14 2.221E-01  (P 3.121E-02 1.56E-02 G
                          510.72 3.094E-01 + P 1.501E-01 5.96E-02 G

PB-212       6.6986E-01
                          238.63 6.480E-01  (P 8.077E-02 3.42E-02 G K
                                                          Energy duplication
                           77.11 6.088E-01 } P 3.151E-01 8.27E-02 G
                           74.81 8.402E-01 + P 6.370E-01 2.02E-01 G

PB-214       3.5439E-01
                          351.99 3.599E-01  (P 7.156E-02 3.13E-02 G K
                          295.22 3.437E-01 @(P 1.392E-01 5.20E-02 G
                                                          Energy duplication
                           77.11 0.000E+00 } P 7.591E-01 0.00E+00 G
                          241.92 2.020E-02 %   5.129E-01 1.53E-01 G

BI-212       5.8504E-01
                          727.17 5.850E-01 *(P 2.575E-01 1.07E-01 G K
                         1620.56 3.379E-01 & P 7.502E-01 2.27E-01 G
                          785.42 6.104E-01 %   1.389E+00 4.19E-01 G

BI-214       2.8807E-01
                          609.32 2.908E-01  (P 6.330E-02 2.57E-02 G K
                         1764.51 2.801E-01 @(P 1.147E-01 5.22E-02 G
                         1120.28 2.241E-01 - P 2.845E-01 8.88E-02 G

RA-224       4.7833E-01
                          241.00 4.783E-01 %(  9.507E-01 2.89E-01 G

RA-226       1.0581E+00
                          185.99 1.058E+00 *(P 9.127E-01 2.84E-01 G

AC-228       7.7151E-01
                          911.07 7.567E-01  (P 1.512E-01 7.78E-02 G K
                          968.90 7.962E-01  (P 1.215E-01 6.76E-02 G
                          338.40 5.851E-01 - P 1.911E-01 7.20E-02 G

TH-227      -1.7764E-01
                          236.00-1.776E-01 %(  3.372E-01 1.02E-01 G K
                          256.25 5.611E-02 % P 4.060E-01 1.21E-01 G

PA-234       2.2562E-02
                           98.44 2.256E-02 %(P 1.911E-01 5.71E-02 G K
                          946.00 1.521E-02 % P 1.595E-01 4.60E-02 G
                          131.28-1.813E-02 % P 1.700E-01 5.08E-02 G
                           94.67-1.129E-01 % P 3.564E-01 1.07E-01 G
                          883.24-4.720E-02 %   2.331E-01 6.80E-02 G
                          926.70 1.014E-01 &   2.108E-01 6.40E-02 G
```

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26 8.215E-03 & P 2.777E-01 8.03E-02 G

TH-234       8.2069E-01
                           63.29 8.207E-01 %(P 5.422E+00 1.62E+00 G K
                           92.80 1.112E+00 & P 1.823E+00 5.53E-01 G
                           92.38 1.319E+00 & P 2.164E+00 6.57E-01 G

AM-241      -6.5431E-02
                           59.54-6.543E-02 %(P 8.452E-01 2.51E-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	2.2174E-02	2.5136E-02	2.1769E-01	2.1770E-01	2.200E-01
K-40		1.2660E+01	1.2660E+01	1.1052E+00	1.3273E+00	
MN-54	#A	4.8308E-03	4.9355E-03	2.8086E-02	2.8088E-02	3.147E-02
CO-57	#B	-1.0819E-02	-1.1090E-02	3.9497E-02	3.9502E-02	4.171E-02
CO-60	#B	-2.2426E-03	-2.2504E-03	3.9046E-01	3.9046E-01	3.050E-02

Sr-85	#A	-1.1304E-02	-1.2534E-02	3.6759E-02	3.6766E-02	3.689E-02
Kr-85	#A	-2.6103E+02	-2.6105E+02	7.6539E+02	7.6554E+02	8.515E+02
Y-88	#B	-4.2178E-04	-4.4912E-04	2.1476E-02	2.1476E-02	1.852E-02
NB-94	#B	-4.7787E-03	-4.7787E-03	2.6091E-02	2.6092E-02	2.992E-02
Ag-108M	#B	-3.5391E-03	-3.5396E-03	3.0743E-02	3.0743E-02	3.520E-02
CD-109	#A	2.5041E-02	2.5414E-02	1.5633E+00	1.5633E+00	1.721E+00
SN-113	#B	-2.1855E-03	-2.3165E-03	3.7400E-02	3.7400E-02	4.016E-02
SB-125	#B	6.2521E-02	6.2936E-02	6.7499E-02	6.7598E-02	9.607E-02
I-131	#B	5.9055E-03	1.3581E-02	5.9839E-02	5.9844E-02	2.929E-02
CS-134	#B	8.5840E-03	8.6607E-03	9.6584E-03	9.6715E-03	3.276E-02
CS-137	#A	9.4333E-03	9.4391E-03	2.5903E-02	2.5909E-02	2.914E-02
CE-139	#A	3.2691E-03	3.4322E-03	3.5197E-02	3.5198E-02	3.747E-02
EU-152	#B	-1.1642E-03	-1.1659E-03	6.8524E-01	6.8524E-01	1.190E-01
EU-154	#B	6.8366E-03	6.8513E-03	8.1283E-02	8.1284E-02	9.055E-02
EU-155	#B	1.0388E-01	1.0426E-01	1.7976E-01	1.7985E-01	1.965E-01
HG-203	#B	-4.1441E-03	-4.7846E-03	3.5585E-02	3.5586E-02	3.436E-02
TL-208		2.2212E-01	2.2212E-01	4.6785E-02	4.8530E-02	
PB-212		6.6986E-01	6.6986E-01	1.0592E-01	1.1283E-01	
PB-214		3.5439E-01	3.5439E-01	9.2594E-02	9.4852E-02	
BI-212	#	5.8504E-01	5.8504E-01	3.2130E-01	3.2309E-01	
BI-214	#	2.8807E-01	2.8807E-01	7.6422E-02	7.8230E-02	6.330E-02
RA-224	#A	4.7833E-01	4.7833E-01	8.6586E-01	8.6631E-01	9.507E-01
RA-226	#	1.0581E+00	1.0581E+00	8.5090E-01	8.5311E-01	9.127E-01
AC-228		7.7151E-01	7.7151E-01	1.5431E-01	1.6068E-01	
TH-227	#B	-1.7764E-01	-1.7764E-01	3.0742E-01	3.0759E-01	3.372E-01
PA-234	#B	2.2562E-02	2.2562E-02	1.7144E-01	1.7144E-01	1.911E-01
TH-234	#B	8.2069E-01	8.2069E-01	4.8560E+00	4.8563E+00	5.422E+00
AM-241	#A	-6.5429E-02	-6.5431E-02	7.8885E-01	7.8886E-01	8.452E-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) 1.5262498E+01 pCi/gm
Total Decayed Activity (1460.6 to 2000.7 keV) 1.5262498E+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_6JULY2006_1117.An1

Sample description
FSS-OOL-10-03-029-F-B

Spectrum Filename: C:\GammaVision\Spectra\103F_6JULY2006_1117.An1

Acquisition information
Start time: 06-Jul-2006 11:17:30
Live time: 2000
Real time: 2003
Dead time: 0.13 %
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: 2.3600E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 2.3600E+03) =
4.2373E+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	26-Jun-2006 16:11:00
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: 0.2331

***** 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	165.	18.84	0.99	9.052E-03	72.87	6.400	PBC<MDA	HG203
					74.81	9.600	1.090E+00	PB212
77.22	214.	12.39	0.99	1.011E-02	77.11	17.500	8.271E-01	PB212
					77.11	10.700	1.353E+00	PB214
87.38	121.	38.92	1.50	1.472E-02	86.45	32.740	PBC<MDA	EU155
					88.04	3.790	1.265E+00	CD109
92.81	111.	39.20	1.50	1.631E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
93.09	130.	33.46	1.50	1.645E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
186.56	197.	22.21	1.07	2.565E-02	185.99	3.280	1.253E+00	RA226
209.47	134.	29.52	1.05	2.470E-02				
238.81	1349.	3.20	1.09	2.319E-02	238.63	43.100	7.655E-01	PB212
241.51	196.	18.15	1.09	2.305E-02	241.00	3.900	1.246E+00	RA224
					241.92	7.470	6.521E-01	PB214
270.50	166.	22.95	1.06	2.150E-02				
277.97	58.	41.43	1.44	2.111E-02				
277.97	58.	41.43	1.44	2.111E-02	279.17	81.500	PBC<MDA	HG203
295.18	329.	9.99	1.17	2.025E-02	295.22	19.200	4.783E-01	PB214
300.68	118.	26.08	1.07	1.998E-02				
327.85	86.	27.65	1.11	1.875E-02				
338.62	288.	11.77	0.93	1.829E-02	338.40	12.010	7.485E-01	AC228
352.04	510.	8.07	1.30	1.775E-02	351.99	37.100	4.387E-01	PB214
463.22	83.	28.01	1.06	1.425E-02				
463.22	83.	28.01	1.06	1.425E-02	463.51	10.000	3.307E-01	SB125
510.84	223.	15.92	1.26	1.317E-02	510.72	22.500	3.797E-01	TL208
583.37	477.	7.44	1.32	1.184E-02	583.14	86.000	2.657E-01	TL208

609.70	356.	8.15	1.44	1.143E-02	609.32	46.090	3.801E-01	BI214
727.69	113.	18.58	1.48	9.959E-03	727.17	11.800	5.479E-01	BI212
768.07	51.	36.34	0.75	9.555E-03				
794.49	54.	29.01	1.14	9.313E-03				
860.80	88.	21.65	1.98	8.766E-03				
911.55	304.	9.15	1.44	8.398E-03	911.07	29.000	7.068E-01	AC228
965.03	74.	16.56	1.54	8.049E-03				
969.43	186.	8.92	1.54	8.022E-03	968.90	17.460	7.578E-01	AC228
1120.59	116.	19.60	1.23	7.210E-03	1120.28	15.040	6.034E-01	BI214

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
1461.33	1666.	2.49	1.96	5.930E-03	1460.75	10.700	1.486E+01	K40
1588.62	68.	20.36	1.09	5.571E-03				
1621.35	14.	39.23	1.94	5.488E-03	1620.56	2.750	PBC<MDA	BI212
1765.40	76.	13.16	1.67	5.140E-03	1764.51	15.920	5.088E-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	
418.11	209.47	598.	134.	0.067	88.55	1.050	AC-228	s
540.16	270.50	478.	166.	0.083	68.84	1.064	AC-228	s
600.51	300.68	328.	118.	0.059	78.23	1.072	PB-212	
654.84	327.85	226.	86.	0.043	82.96	1.106	AC-228	
1535.20	768.07	103.	51.	0.026	109.03	0.750	BI-214	sM
1588.03	794.49	74.	58.	0.029	74.50	1.135	AC-228	s
1720.64	860.80	88.	88.	0.044	64.94	1.975	TL-208	s
1930.01	965.06	44.	68.	0.034	54.81	1.539	AC-228	D
3176.06	1588.62	25.	68.	0.034	61.07	1.093	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	423.	165.	0.083	56.52	0.993D
PB-212	153.39	77.11	437.	214.	0.107	37.16	0.995A
CD-109	173.93	87.38	1056.	121.	0.061	116.75	1.500s
TH-234	185.36	93.09	1166.	130.	0.065	100.39	1.500
RA-226	372.28	186.56	730.	184.	0.092	66.62	1.066s
PB-212	476.42	238.63	271.	1338.	0.669	9.61	1.093D
PB-214	483.00	241.92	403.	135.	0.068	52.91	1.095A
PB-214	589.50	295.18	316.	325.	0.162	29.96	1.173
AC-228	676.38	338.62	321.	287.	0.144	35.30	0.932
PB-214	703.22	352.04	364.	505.	0.252	24.20	1.304
SB-125	925.37	463.13	195.	64.	0.032	97.18	1.500
TL-208	1020.80	510.84	307.	197.	0.098	47.75	1.258s
TL-208	1165.84	583.37	204.	473.	0.236	22.31	1.325
BI-214	1218.49	609.70	164.	350.	0.175	24.46	1.441
BI-212	1454.44	727.69	117.	113.	0.056	55.73	1.476
AC-228	1822.13	911.55	130.	301.	0.150	27.44	1.445

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
AC-228	1936.81	968.90	48.	185.	0.092	27.17	1.541D
BI-214	2240.15	1120.59	114.	114.	0.057	58.80	1.229s
K-40	2921.53	1461.33	36.	1647.	0.824	7.47	1.962
BI-212	3241.51	1621.35	8.	14.	0.007	117.69	1.944s
BI-214	3529.56	1765.40	9.	73.	0.036	39.47	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	Peak MDA Value pCi/gm	COMMENTS
BE-7		7.2420E-02					
			477.56	7.242E-02	&(	2.962E-01 8.80E-02 G	
K-40		1.4862E+01					
			1460.75	1.486E+01	(P	2.750E-01 3.75E-01 G	
MN-54		9.3741E-03					
			834.81	9.374E-03	%(P	2.337E-02 7.00E-03 G	
CO-57		-7.4840E-04					
			122.07	-7.484E-04	&(P	4.771E-02 1.42E-02 G K	
			136.43	-5.042E-03	&	3.640E-01 1.09E-01 G	
CO-60		-3.3678E-03					
			1332.51	-3.368E-03	%(P	3.105E-02 8.48E-03 G K	
			1173.23	3.577E-03	% P	4.242E-02 1.23E-02 G K	
Sr-85		-2.1534E-02					
			514.00	-2.153E-02	%(	4.301E-02 1.31E-02 G	
Kr-85		-4.4773E+02					
			513.99	-4.477E+02	%(	8.943E+02 2.72E+02 G	
Y-88		-4.7275E-04					
			1836.01	-4.728E-04	%(P	2.145E-02 5.52E-03 G K	
			898.02	-4.828E-04	% P	3.837E-02 1.10E-02 G	
NB-94		1.0449E-04					
			871.10	1.045E-04	%(	2.978E-02 8.50E-03 G K	
			702.50	7.214E-03	%	3.109E-02 9.20E-03 G K	

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
Ag-108M	-5.3558E-03						
		722.95	-5.356E-03	%(	3.446E-02	1.01E-02	G K
		614.37	-1.138E-02	% P	3.832E-02	1.14E-02	G
		433.93	-5.182E-03	%	3.061E-02	9.06E-03	G
CD-109	1.2650E+00						
		88.04	1.265E+00	(	1.606E+00	4.92E-01	G
SN-113	-6.6945E-04						
		391.71	-6.694E-04	&(	4.418E-02	1.29E-02	G K
		255.04	6.255E-03	&	1.279E+00	3.77E-01	G
SB-125	5.2971E-02						
		427.95	-1.712E-02	%(P	8.915E-02	2.64E-02	G K
		600.77	-3.844E-05	& P	1.704E-01	4.95E-02	G
		636.15	-2.770E-02	% P	2.474E-01	7.19E-02	G
		463.51	2.604E-01	(P	2.739E-01	8.60E-02	G
		176.29	1.117E-02	%	4.077E-01	1.21E-01	G
I-131	2.5276E-02						
		364.48	2.528E-02	%(P	6.898E-02	2.07E-02	G K
		636.97	-7.533E-02	%	9.034E-01	2.63E-01	G
		284.29	1.845E-02	& P	1.101E+00	3.26E-01	G
CS-134	-1.6492E-03						
		604.66	-1.649E-03	&(	3.133E-02	9.13E-03	G K
		795.76	-3.161E-03	% P	4.490E-02	1.31E-02	G
		569.29	2.494E-02	& P	1.694E-01	4.95E-02	G
		801.84	-1.557E-02	& P	3.059E-01	8.62E-02	G
CS-137	-9.4950E-04						
		661.62	-9.495E-04	%(P	3.065E-02	8.72E-03	G
CE-139	-7.1184E-03						
		165.85	-7.118E-03	%(	4.373E-02	1.31E-02	G
EU-152	-3.7355E-03						
		121.78	-3.735E-03	&(P	1.336E-01	3.99E-02	G K
		344.30	-1.960E-02	% P	1.035E-01	3.08E-02	G
		1408.08	3.754E-02	%	1.166E-01	3.43E-02	G
		964.00	6.723E-02	% P	2.313E-01	6.85E-02	G
		1112.07	2.270E-02	%	2.749E-01	7.95E-02	G
		778.90	-2.925E-02	%	2.374E-01	6.92E-02	G
EU-154	5.6692E-03						
		123.10	5.669E-03	%(	9.945E-02	2.97E-02	G K
		1274.80	5.127E-02	%	7.809E-02	2.44E-02	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          723.30-6.981E-02 %   1.779E-01 5.35E-02 G
                         1004.80-4.396E-02 %   1.743E-01 5.13E-02 G

EU-155       1.2491E-01
                           86.45 1.249E-01 %(  2.049E-01 6.24E-02 G K
                          105.31 1.046E-01 %   2.100E-01 6.37E-02 G

HG-203      -1.6590E-03
                          279.17-1.659E-03 &(P 4.241E-02 1.26E-02 G K
                           72.87 8.826E-03 & P 2.144E+00 6.40E-01 G
                           70.83-2.604E-01 %   3.893E+00 1.16E+00 G
                           82.50-1.069E+00 %   3.810E+00 1.15E+00 G

TL-208       2.6566E-01
                          583.14 2.657E-01  (P 3.897E-02 1.99E-02 G
                          510.72 3.797E-01 + P 1.631E-01 6.86E-02 G

PB-212       7.8390E-01
                          238.63 7.664E-01  (P 4.550E-02 2.48E-02 G K
                                                          Energy duplication
                           77.11 6.937E-01 } P 3.240E-01 8.59E-02 G
                           74.81 1.090E+00 + P 6.491E-01 2.09E-01 G

PB-214       4.4952E-01
                          351.99 4.387E-01  (P 7.970E-02 3.58E-02 G K
                          295.22 4.783E-01  (P 1.261E-01 4.84E-02 G
                                                          Energy duplication
                           77.11 0.000E+00 } P 7.752E-01 0.00E+00 G
                          241.92 4.495E-01 }   3.205E-01 7.93E-02 G

BI-212       5.4440E-01
                          727.17 5.479E-01  (P 2.592E-01 1.02E-01 G K
                         1620.56 5.295E-01 ?(P 6.068E-01 2.08E-01 G
                          785.42 6.139E-01 %   1.605E+00 4.82E-01 G

BI-214       3.8015E-01
                          609.32 3.801E-01  (P 6.775E-02 3.16E-02 G K
                         1764.51 5.088E-01 + P 1.182E-01 7.00E-02 G
                         1120.28 6.034E-01 + P 2.766E-01 1.20E-01 G

RA-224       7.2062E-01
                                                          Derived Ave Activity
                          241.00 7.206E-01 }(  1.040E+00 3.28E-01 G

RA-226       1.2532E+00
                          185.99 1.253E+00 *(P 8.747E-01 2.98E-01 G

AC-228       7.2997E-01
                          911.07 7.068E-01  (P 1.314E-01 6.54E-02 G K
                          968.90 7.557E-01  (P 1.431E-01 6.85E-02 G
```

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 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          338.40 7.485E-01  (P 2.245E-01 8.84E-02 G

TH-227      -1.4037E-01
                          236.00-1.404E-01 %(  3.179E-01 9.63E-02 G K
                          256.25 5.189E-02 % P 4.008E-01 1.19E-01 G

PA-234      -3.6592E-03
                           98.44-3.659E-03 &(P 1.706E-01 5.08E-02 G K
                          946.00-4.887E-03 & P 1.618E-01 4.64E-02 G
                          131.28 7.956E-03 & P 1.377E-01 4.09E-02 G
                           94.67-7.912E-02 % P 3.637E-01 1.09E-01 G
                          883.24 0.000E+00 &   2.514E-01 7.17E-02 G
                          926.70 1.007E-01 %   2.069E-01 6.29E-02 G
                          569.26 3.632E-02 & P 2.491E-01 7.28E-02 G

TH-234       5.3651E-01
                           63.29-2.121E-01 &(P 5.783E+00 1.72E+00 G K
                           92.80 1.510E+00  (P 1.878E+00 5.74E-01 G
                           92.38 1.519E+00 & P 2.268E+00 6.90E-01 G

AM-241      -4.2699E-02
                           59.54-4.270E-02 &(P 9.633E-01 2.87E-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	6.3773E-02	7.2420E-02	2.6412E-01	2.6415E-01	2.608E-01
K-40		1.4862E+01	1.4862E+01	1.1235E+00	1.4166E+00	
MN-54	#A	9.1724E-03	9.3741E-03	2.0985E-02	2.0992E-02	2.286E-02
CO-57	#B	-7.2981E-04	-7.4840E-04	6.0038E-02	6.0038E-02	4.652E-02
CO-60	#B	-3.3559E-03	-3.3678E-03	1.5082E-01	1.5082E-01	3.094E-02
Sr-85	#A	-1.9393E-02	-2.1534E-02	3.9184E-02	3.9204E-02	3.874E-02
Kr-85	#A	-4.4770E+02	-4.4773E+02	8.1471E+02	8.1512E+02	8.943E+02
Y-88	#B	-4.4358E-04	-4.7275E-04	2.3080E-02	2.3080E-02	2.013E-02
NB-94	#B	1.0449E-04	1.0449E-04	2.5501E-02	2.5501E-02	2.978E-02
Ag-108M	#B	-5.3550E-03	-5.3558E-03	3.0324E-02	3.0326E-02	3.446E-02
CD-109	#A	1.2462E+00	1.2650E+00	1.4769E+00	1.4785E+00	1.582E+00
SN-113	#B	-6.3110E-04	-6.6945E-04	3.8834E-02	3.8834E-02	4.165E-02
SB-125	#B	5.2617E-02	5.2971E-02	5.2498E-02	5.2588E-02	8.856E-02
I-131	#B	1.0862E-02	2.5276E-02	6.2180E-02	6.2197E-02	2.965E-02
CS-134	#B	-1.6344E-03	-1.6492E-03	2.7398E-02	2.7398E-02	3.105E-02
CS-137	#A	-9.4891E-04	-9.4950E-04	6.5405E-01	6.5405E-01	3.063E-02
CE-139	#A	-6.7754E-03	-7.1184E-03	3.9340E-02	3.9342E-02	4.163E-02
EU-152	#B	-3.7300E-03	-3.7355E-03	1.8486E-01	1.8486E-01	1.334E-01
EU-154	#B	5.6568E-03	5.6692E-03	8.9229E-02	8.9230E-02	9.923E-02
EU-155	#B	1.2444E-01	1.2491E-01	1.8725E-01	1.8737E-01	2.041E-01
HG-203	#B	-1.4340E-03	-1.6590E-03	3.8416E-02	3.8416E-02	3.666E-02
TL-208		2.6566E-01	2.6566E-01	5.9796E-02	6.1753E-02	
PB-212		7.8390E-01	7.8390E-01	7.5968E-02	8.8558E-02	
PB-214		4.4952E-01	4.4952E-01	1.1001E-01	1.1307E-01	
BI-212		5.4440E-01	5.4440E-01	3.0471E-01	3.0634E-01	
BI-214		3.8015E-01	3.8015E-01	9.4697E-02	9.7235E-02	
RA-224	A	7.2062E-01	7.2062E-01	9.6320E-01	9.6411E-01	
RA-226	#	1.2532E+00	1.2532E+00	8.9354E-01	8.9649E-01	
AC-228		7.2997E-01	7.2997E-01	1.2793E-01	1.3477E-01	
TH-227	#B	-1.4037E-01	-1.4037E-01	2.8884E-01	2.8895E-01	3.179E-01
PA-234	#B	-3.6592E-03	-3.6592E-03	3.0771E-01	3.0771E-01	1.706E-01
TH-234	#B	5.3651E-01	5.3651E-01	6.1166E-01	6.1238E-01	5.783E+00
AM-241	#A	-4.2698E-02	-4.2699E-02	9.1929E-01	9.1929E-01	9.633E-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) 1.9989847E+01 pCi/gm
Total Decayed Activity (1120.0 to 2000.7 keV) 1.9989861E+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_28JUN2006_1925.An1

Sample description
FSS-OOL-10-03-001-F

Spectrum Filename: C:\GammaVision\Spectra\103F_28JUN2006_1925.An1

Acquisition information
Start time: 28-Jun-2006 19:25:49
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: 1.9030E+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	26-Jun-2006 16:36:00
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: 0.2099

***** 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	103.	29.05	0.99	9.049E-03	74.81	9.600	8.155E-01	PB212
77.42	247.	12.35	0.99	1.044E-02	77.11	17.500	9.782E-01	PB212
					77.11	10.700	1.600E+00	PB214
84.40	68.	32.80	0.62	1.328E-02				
93.12	119.	33.12	1.50	1.631E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
93.12	123.	31.89	1.50	1.645E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
186.06	193.	22.02	1.04	2.566E-02	185.99	3.280	1.517E+00	RA226
209.48	121.	23.45	0.98	2.470E-02				
238.79	1144.	3.49	1.09	2.320E-02	238.63	43.100	8.039E-01	PB212
241.73	150.	17.39	1.09	2.304E-02	241.00	3.900	1.184E+00	RA224
					241.92	7.470	6.194E-01	PB214
270.16	103.	26.79	0.75	2.152E-02				
277.65	56.	36.08	1.42	2.113E-02				
295.35	250.	9.25	1.13	2.025E-02	295.22	19.200	4.489E-01	PB214
300.11	83.	23.12	1.13	2.002E-02				
328.36	93.	26.39	1.29	1.873E-02				
338.41	286.	9.39	0.97	1.830E-02	338.40	12.010	9.189E-01	AC228
352.09	394.	6.78	1.22	1.775E-02	351.99	37.100	4.185E-01	PB214
409.99	56.	40.36	1.01	1.573E-02				
462.74	104.	20.03	1.33	1.427E-02				
462.74	104.	20.03	1.33	1.427E-02	463.51	10.000	5.153E-01	SB125
510.74	181.	11.50	1.51	1.317E-02	510.72	22.500	3.698E-01	TL208
583.39	386.	5.81	1.30	1.184E-02	583.14	86.000	2.662E-01	TL208
609.44	306.	8.47	1.53	1.144E-02	609.32	46.090	4.029E-01	BI214
727.69	118.	18.10	1.54	9.959E-03	727.17	11.800	7.127E-01	BI212

911.60	314.	7.66	1.77	8.398E-03	911.07	29.000	9.068E-01	AC228
968.71	204.	12.84	1.38	8.027E-03	968.90	17.460	1.034E+00	AC228
1120.61	102.	22.54	1.44	7.210E-03	1120.28	15.040	6.580E-01	BI214
1461.27	1377.	2.79	1.84	5.930E-03	1460.75	10.700	1.520E+01	K40
1620.53	18.	38.65	1.91	5.488E-03	1620.56	2.750	8.402E-01	BI212
1765.01	60.	13.25	2.59	5.142E-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
418.12	209.48	342.	121.	0.060	70.35	0.980	AC-228
539.47	270.16	289.	103.	0.052	80.36	0.748	AC-228 s
599.01	299.93	218.	86.	0.043	83.38	1.186	TH-227
655.87	328.36	224.	93.	0.047	79.18	1.288	RH-106M s
819.10	409.99	178.	56.	0.028	121.08	1.009	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	355.	143.	0.071	59.96	0.993D
PB-212	153.39	77.11	357.	201.	0.101	2.98	0.995A
TH-234	185.41	93.12	980.	119.	0.060	99.37	1.500s
TH-234	185.42	93.12	950.	123.	0.061	95.67	1.500s
RA-226	371.72	186.28	727.	120.	0.060	89.16	1.500s
PB-212	476.42	238.63	235.	1136.	0.568	10.44	1.093D
PB-214	483.00	241.92	348.	103.	0.052	62.16	1.095A
PB-214	589.48	295.17	313.	250.	0.125	38.37	1.267s
AC-228	675.97	338.41	190.	284.	0.142	28.18	0.975s
PB-214	703.33	352.09	151.	388.	0.194	20.35	1.223
SB-125	925.42	463.15	166.	83.	0.041	72.46	1.500s
TL-208	1020.60	510.74	132.	154.	0.077	34.49	1.515s
TL-208	1165.80	583.35	104.	389.	0.195	19.45	1.515
BI-214	1217.98	609.44	117.	299.	0.150	25.41	1.532s
BI-212	1454.46	727.69	104.	118.	0.059	54.30	1.535s
AC-228	1822.23	911.60	84.	311.	0.156	22.98	1.774
AC-228	1936.44	968.71	118.	204.	0.102	38.51	1.384s
BI-214	2240.20	1120.61	121.	101.	0.050	67.63	1.437s
K-40	2921.42	1461.27	44.	1358.	0.679	8.38	1.838
BI-212	3239.87	1620.53	8.	18.	0.009	115.96	1.910
BI-214	3528.78	1765.01	6.	60.	0.030	39.76	2.591s

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		-1.0740E-01					
			477.56	-1.074E-01	%(	3.152E-01 9.44E-02	G
K-40		1.5198E+01					
			1460.75	1.520E+01	(P	3.743E-01 4.30E-01	G
MN-54		-7.6605E-03					
			834.81	-7.661E-03	%(P	3.819E-02 1.12E-02	G
CO-57		4.0442E-03					
			122.07	4.044E-03	%(P	4.843E-02 1.45E-02	G K
			136.43	8.142E-02	%	3.812E-01 1.14E-01	G
CO-60		3.8086E-03					
			1332.51	3.809E-03	%(P	3.683E-02 1.03E-02	G K
			1173.23	2.553E-02	% P	4.876E-02 1.48E-02	G K
Sr-85		-2.5802E-02					
			514.00	-2.580E-02	&(	4.472E-02 1.37E-02	G
Kr-85		-5.8231E+02					
			513.99	-5.823E+02	&(	1.009E+03 3.08E+02	G
Y-88		1.9319E-03					
			1836.01	1.932E-03	&(P	2.615E-02 6.94E-03	G K
			898.02	-7.068E-03	& P	4.329E-02 1.26E-02	G
NB-94		-1.4265E-03					
			871.10	-1.426E-03	&(	3.675E-02 1.05E-02	G K
			702.50	8.692E-03	%	3.589E-02 1.06E-02	G K
Ag-108M		8.3449E-04					
			722.95	8.345E-04	%(	6.435E-02 1.89E-02	G K
			614.37	-1.678E-02	% P	4.330E-02 1.30E-02	G
			433.93	-1.314E-03	%	3.802E-02 1.11E-02	G
CD-109		1.1923E+00					
			88.04	1.192E+00	%(	1.805E+00 5.51E-01	G
SN-113		-6.2341E-03					
			391.71	-6.234E-03	%(	5.301E-02 1.57E-02	G K
			255.04	3.076E-01	&	1.478E+00 4.41E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	1.0454E-01						
		427.95	4.389E-05	%(P	9.474E-02	2.75E-02	G K
		600.77	1.811E-02	% P	1.506E-01	4.36E-02	G
		636.15	6.585E-02	& P	2.632E-01	7.75E-02	G
		463.51	4.139E-01	*(P	3.132E-01	1.01E-01	G
		176.29	-3.302E-02	&	5.869E-01	1.75E-01	G
I-131	-1.3114E-02						
		364.48	-1.311E-02	%(P	4.509E-02	1.35E-02	G K
		636.97	1.601E-01	&	4.648E-01	1.39E-01	G
		284.29	-4.136E-02	% P	6.319E-01	1.87E-01	G
CS-134	-1.0280E-02						
		604.66	-1.028E-02	%(	3.322E-02	9.89E-03	G K
		795.76	2.630E-02	% P	3.722E-02	1.16E-02	G
		569.29	-3.924E-02	% P	2.079E-01	6.06E-02	G
		801.84	-8.525E-02	% P	3.944E-01	1.14E-01	G
CS-137	1.7113E-02						
		661.62	1.711E-02	%(P	4.656E-02	1.39E-02	G
CE-139	-1.8420E-04						
		165.85	-1.842E-04	&(	4.229E-02	1.26E-02	G
EU-152	-2.8711E-03						
		121.78	-2.871E-03	%(P	1.113E-01	3.29E-02	G K
		344.30	1.452E-02	& P	1.081E-01	3.19E-02	G
		1408.08	4.824E-03	%	1.317E-01	3.58E-02	G
		964.00	1.652E-01	% P	2.605E-01	8.04E-02	G
		1112.07	1.117E-01	%	2.837E-01	8.50E-02	G
		778.90	-4.241E-02	%	2.368E-01	6.89E-02	G
EU-154	1.7522E-02						
		123.10	1.752E-02	&(	9.755E-02	2.92E-02	G K
		1274.80	-2.702E-02	&	1.296E-01	3.79E-02	G
		723.30	-1.151E-02	%	3.352E-01	9.90E-02	G
		1004.80	-4.516E-02	%	2.058E-01	6.02E-02	G
EU-155	-3.6264E-03						
		86.45	-3.626E-03	%(	2.396E-01	7.15E-02	G K
		105.31	4.683E-02	%	2.430E-01	7.29E-02	G
HG-203	-1.0721E-02						
		279.17	-1.072E-02	&(P	4.360E-02	1.31E-02	G K
		72.87	-9.188E-01	% P	2.240E+00	6.77E-01	G
		70.83	2.609E-02	&	2.943E+00	8.70E-01	G
		82.50	-1.347E+00	&	3.934E+00	1.19E+00	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	2.7152E-01						
		583.14	2.715E-01	(P	3.494E-02	1.78E-02	G
		510.72	3.698E-01	+ P	1.346E-01	4.99E-02	G
PB-212	8.0653E-01						
		238.63	8.065E-01	(P	5.269E-02	2.84E-02	G K
							Energy duplication
		77.11	8.065E-01	} P	3.641E-01	8.01E-03	G
		74.81	1.167E+00	+ P	7.399E-01	2.38E-01	G
PB-214	4.2680E-01						
		351.99	4.185E-01	(P	6.463E-02	2.88E-02	G K
		295.22	4.569E-01	@(P	1.555E-01	5.94E-02	G
							Energy duplication
		77.11	7.657E-02	} P	8.815E-01	2.23E-01	G
		241.92	4.268E-01	}	3.704E-01	8.84E-02	G
BI-212	7.3677E-01						
		727.17	7.127E-01	(P	3.034E-01	1.30E-01	G K
		1620.56	8.402E-01	(P	7.533E-01	3.26E-01	G
		785.42	5.872E-01	%	1.583E+00	4.73E-01	G
BI-214	4.0289E-01						
		609.32	4.029E-01	*(P	7.150E-02	3.49E-02	G K
		1764.51	5.242E-01	+ P	1.189E-01	7.33E-02	G
		1120.28	6.580E-01	+ P	3.540E-01	1.51E-01	G
RA-224	8.1703E-01						
							Derived Ave Activity
		241.00	8.170E-01	}(	1.181E+00	3.73E-01	G
RA-226	1.0123E+00						
		185.99	1.012E+00	*(P	1.083E+00	3.33E-01	G
AC-228	9.4730E-01						
		911.07	9.068E-01	(P	1.323E-01	7.02E-02	G K
		968.90	1.034E+00	@(P	2.702E-01	1.33E-01	G
		338.40	9.189E-01	@(P	2.161E-01	8.66E-02	G
TH-227	-1.6320E-01						
		236.00	-1.632E-01	%(	3.671E-01	1.11E-01	G K
		256.25	1.008E-01	% P	4.698E-01	1.40E-01	G
PA-234	2.9113E-02						
		98.44	2.911E-02	%(P	2.173E-01	6.50E-02	G K
		946.00	-2.783E-02	& P	1.917E-01	5.57E-02	G
		131.28	3.007E-02	& P	2.109E-01	6.32E-02	G
		94.67	1.051E-02	% P	3.964E-01	1.18E-01	G
		883.24	-4.989E-02	%	2.895E-01	8.43E-02	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          926.70 1.146E-01 %   3.499E-01 1.04E-01 G
                          569.26-5.801E-02 % P 3.079E-01 8.97E-02 G

TH-234       2.0956E+00
                           63.29 2.396E+00 %(P 6.056E+00 1.83E+00 G K
                           92.80 1.767E+00  (P 2.106E+00 6.44E-01 G
                           92.38 2.024E+00 &(P 2.518E+00 7.69E-01 G

AM-241      -4.6895E-01
                           59.54-4.689E-01 %(P 1.146E+00 3.46E-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	-1.0449E-01	-1.0740E-01	2.8321E-01	2.8328E-01	3.066E-01
K-40		1.5198E+01	1.5198E+01	1.2907E+00	1.5635E+00	
MN-54	#A	-7.6246E-03	-7.6605E-03	3.6128E-02	3.6130E-02	3.801E-02
CO-57	#B	4.0223E-03	4.0442E-03	4.3363E-02	4.3364E-02	4.817E-02

CO-60	#B	3.8057E-03	3.8086E-03	3.0910E-02	3.0910E-02	3.680E-02
Sr-85	#A	-2.5224E-02	-2.5802E-02	4.0952E-02	4.0980E-02	4.372E-02
Kr-85	#A	-5.8231E+02	-5.8231E+02	9.2426E+02	9.2488E+02	1.009E+03
Y-88	#B	1.9054E-03	1.9319E-03	2.0810E-02	2.0810E-02	2.579E-02
NB-94	#B	-1.4265E-03	-1.4265E-03	3.1604E-02	3.1605E-02	3.675E-02
Ag-108M	#B	8.3446E-04	8.3449E-04	5.6705E-02	5.6705E-02	6.435E-02
CD-109	#A	1.1884E+00	1.1923E+00	1.6536E+00	1.6549E+00	1.799E+00
SN-113	#B	-6.1551E-03	-6.2341E-03	4.6978E-02	4.6980E-02	5.234E-02
SB-125	#F	1.0439E-01	1.0454E-01	7.6918E-02	7.7157E-02	9.460E-02
I-131	#B	-1.0926E-02	-1.3114E-02	4.3002E-02	4.3009E-02	3.756E-02
CS-134	#B	-1.0260E-02	-1.0280E-02	2.9683E-02	2.9689E-02	3.315E-02
CS-137	#A	1.7111E-02	1.7113E-02	4.1828E-02	4.1840E-02	4.655E-02
CE-139	#A	-1.8225E-04	-1.8420E-04	3.7658E-02	3.7658E-02	4.184E-02
EU-152	#B	-2.8702E-03	-2.8711E-03	2.0288E-01	2.0288E-01	1.112E-01
EU-154	#B	1.7514E-02	1.7522E-02	8.7646E-02	8.7652E-02	9.750E-02
EU-155	#B	-3.6235E-03	-3.6264E-03	2.1443E-01	2.1443E-01	2.394E-01
HG-203	#B	-1.0388E-02	-1.0721E-02	3.9291E-02	3.9296E-02	4.225E-02
TL-208		2.7152E-01	2.7152E-01	5.3390E-02	5.5668E-02	
PB-212		8.0653E-01	8.0653E-01	8.5072E-02	9.7107E-02	
PB-214		4.2680E-01	4.2680E-01	8.8096E-02	9.1515E-02	
BI-212		7.3677E-01	7.3677E-01	4.0175E-01	4.0402E-01	
BI-214	#	4.0289E-01	4.0289E-01	1.0458E-01	1.0717E-01	
RA-224	A	8.1703E-01	8.1703E-01	1.0939E+00	1.0950E+00	
RA-226	#A	1.0123E+00	1.0123E+00	1.0000E+00	1.0018E+00	1.083E+00
AC-228		9.4730E-01	9.4730E-01	1.6783E-01	1.7661E-01	
TH-227	#B	-1.6320E-01	-1.6320E-01	3.3354E-01	3.3367E-01	3.671E-01
PA-234	#B	2.9113E-02	2.9113E-02	1.9500E-01	1.9501E-01	2.173E-01
TH-234	#B	2.0956E+00	2.0956E+00	1.9421E+00	1.9456E+00	6.056E+00
AM-241	#A	-4.6894E-01	-4.6895E-01	1.0469E+00	1.0472E+00	1.146E+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 (269.9 to 2000.7 keV) 1.9607208E+01 pCi/gm
Total Decayed Activity (269.9 to 2000.7 keV) 1.9607208E+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_28JUN2006_2002.An1

Sample description
FSS-OOL-10-03-006-F

Spectrum Filename: C:\GammaVision\Spectra\103F_28JUN2006_2002.An1

Acquisition information
Start time: 28-Jun-2006 20:02:54
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: 1.9180E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.9180E+03) =
5.2138E+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	26-Jun-2006 14:35:00
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. 14 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.1260

***** 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	120.	23.24	0.99	9.052E-03	74.81	9.600	9.734E-01	PB212
77.18	188.	12.47	0.99	1.011E-02	77.11	17.500	8.183E-01	PB212
92.81	143.	30.65	1.12	1.645E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
130.39	122.	34.31	1.05	2.451E-02				
186.09	134.	25.18	1.23	2.566E-02	185.99	3.280	PBC<MDA	RA226
208.89	141.	25.44	0.85	2.473E-02				
238.79	1071.	3.60	1.09	2.320E-02	238.63	43.100	7.459E-01	PB212
241.40	138.	22.76	1.09	2.305E-02	241.00	3.900	1.079E+00	RA224
					241.92	7.470	5.648E-01	PB214
269.86	84.	34.09	1.39	2.153E-02				
295.35	250.	12.51	0.96	2.024E-02	295.22	19.200	4.466E-01	PB214
300.47	75.	35.45	0.72	2.000E-02				
338.58	208.	11.14	1.12	1.829E-02	338.40	12.010	6.626E-01	AC228
351.99	431.	9.44	1.17	1.775E-02	351.99	37.100	4.550E-01	PB214
462.94	78.	26.32	0.77	1.426E-02				
462.94	78.	26.32	0.77	1.426E-02	463.51	10.000	3.810E-01	SB125
511.04	185.	15.65	1.68	1.317E-02	510.72	22.500	3.764E-01	TL208
583.28	342.	8.15	1.25	1.184E-02	583.14	86.000	2.338E-01	TL208
609.51	348.	7.09	1.31	1.144E-02	609.32	46.090	4.567E-01	BI214
661.49	37.	33.38	1.37	1.072E-02				
661.49	37.	33.38	1.37	1.072E-02	661.62	84.620	PBC<MDA	CS137
727.48	120.	19.02	1.17	9.961E-03	727.17	11.800	7.173E-01	BI212
795.18	42.	34.26	1.50	9.301E-03	795.76	85.400	PBC<MDA	CS134
835.71	35.	36.05	0.73	8.963E-03	834.81	99.978	PBC<MDA	MN54
861.32	62.	24.52	1.55	8.762E-03				
911.43	231.	7.96	1.14	8.399E-03	911.07	29.000	6.594E-01	AC228

964.78	45.	25.27	1.54	8.051E-03	964.00	14.580	PBC<MDA	EU152
969.39	125.	11.50	1.54	8.022E-03	968.90	17.460	6.282E-01	AC228
1120.37	99.	22.34	1.58	7.211E-03	1120.28	15.040	6.334E-01	BI214
1461.27	1340.	2.79	2.01	5.930E-03	1460.75	10.700	1.467E+01	K40
1589.25	46.	17.83	1.06	5.569E-03				
1764.68	70.	15.34	1.58	5.141E-03	1764.51	15.920	5.726E-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	
259.95	130.39	679.	122.	0.061	102.92	1.049	PA-234	l
416.94	208.89	479.	141.	0.071	76.32	0.847	AC-228	s
538.88	269.86	305.	84.	0.042	102.28	1.387	AC-228	s
600.08	300.47	260.	75.	0.037	106.36	0.718	PB-212	
1721.69	861.32	63.	62.	0.031	73.57	1.550	TL-208	s
1929.58	964.86	40.	47.	0.023	72.43	1.539	AC-228	D
3177.32	1589.25	8.	46.	0.023	53.49	1.056	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	351.	120.	0.060	69.71	0.993D
PB-212	153.39	77.11	354.	188.	0.094	37.42	0.995A
TH-234	184.77	92.80	933.	112.	0.056	102.80	1.500D
RA-226	371.68	186.26	703.	121.	0.061	86.98	1.500s
PB-212	476.80	238.82	729.	1022.	0.511	15.82	1.012
RA-224	482.27	241.56	747.	116.	0.058	103.92	1.500s
PB-214	589.86	295.35	297.	246.	0.123	37.52	0.964
AC-228	676.31	338.58	157.	207.	0.103	33.42	1.125
PB-214	703.12	351.99	356.	425.	0.213	28.33	1.169
SB-125	925.39	463.13	141.	62.	0.031	88.32	1.500s
TL-208	1021.20	511.04	219.	158.	0.079	46.94	1.679s
TL-208	1165.66	583.28	145.	338.	0.169	24.45	1.254
BI-214	1218.12	609.51	107.	342.	0.171	21.28	1.310
CS-137	1322.20	661.56	73.	39.	0.019	101.17	1.500
BI-212	1454.03	727.48	112.	120.	0.060	57.06	1.172
CS-134	1589.42	795.18	81.	42.	0.021	102.79	1.500s
MN-54	1670.97	835.96	49.	34.	0.017	99.87	1.500s
AC-228	1821.89	911.43	45.	228.	0.114	23.89	1.136
EU-152	1928.94	964.96	86.	38.	0.019	112.69	1.538
AC-228	1936.81	968.90	41.	125.	0.062	34.48	1.541D
BI-214	2239.72	1120.37	105.	98.	0.049	67.02	1.577
K-40	2921.42	1461.27	32.	1322.	0.661	8.38	2.005
BI-214	3528.10	1764.68	13.	67.	0.033	46.03	1.577

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		5.6985E-02						
			477.56	5.698E-02	&(	2.707E-01	7.98E-02	G
K-40		1.4671E+01						
			1460.75	1.467E+01	(P	3.242E-01	4.15E-01	G
MN-54		2.6868E-02						
			834.81	2.687E-02	(P	2.781E-02	9.04E-03	G
CO-57		5.1166E-03						
			122.07	5.117E-03	%(P	4.948E-02	1.48E-02	G K
			136.43	-1.226E-01	%	3.383E-01	1.02E-01	G
CO-60		1.5784E-02						
			1332.51	1.578E-02	%(P	3.544E-02	1.05E-02	G K
			1173.23	1.245E-02	% P	4.476E-02	1.32E-02	G K
Sr-85		-1.0751E-02						
			514.00	-1.075E-02	%(	4.014E-02	1.20E-02	G
Kr-85		-2.4213E+02						
			513.99	-2.421E+02	%(	9.048E+02	2.70E+02	G
Y-88		-2.9977E-03						
			1836.01	-2.998E-03	%(P	2.760E-02	7.46E-03	G K
			898.02	3.876E-04	% P	4.370E-02	1.25E-02	G
NB-94		4.8838E-03						
			871.10	4.884E-03	&(	2.760E-02	7.96E-03	G K
			702.50	3.038E-03	&	3.526E-02	1.02E-02	G K
Ag-108M		-1.0505E-02						
			722.95	-1.050E-02	%(	4.291E-02	1.27E-02	G K
			614.37	-8.616E-03	& P	4.039E-02	1.19E-02	G
			433.93	6.854E-03	%	2.870E-02	8.49E-03	G
CD-109		6.4978E-01						
			88.04	6.498E-01	&(	1.842E+00	5.56E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SN-113	6.0132E-03						
		391.71	6.013E-03	&(	4.607E-02	1.36E-02	G K
		255.04	6.137E-01	&	1.243E+00	3.77E-01	G
SB-125	9.5905E-02						
		427.95	2.517E-02	%(P	8.853E-02	2.63E-02	G K
		600.77	1.402E-02	% P	1.758E-01	5.11E-02	G
		636.15	-3.116E-03	& P	2.760E-01	7.88E-02	G
		463.51	3.053E-01	(P	2.878E-01	9.17E-02	G
		176.29	-8.470E-02	%	5.579E-01	1.67E-01	G
I-131	2.3132E-04						
		364.48	2.313E-04	%(P	4.922E-02	1.44E-02	G K
		636.97	6.394E-02	&	5.174E-01	1.51E-01	G
		284.29	-1.713E-01	% P	6.009E-01	1.80E-01	G
CS-134	-1.7411E-02						
		604.66	-1.741E-02	%(	3.849E-02	1.16E-02	G K
		795.76	3.690E-02	+ P	3.966E-02	1.27E-02	G
		569.29	-2.138E-02	& P	2.055E-01	5.93E-02	G
		801.84	4.934E-02	% P	3.684E-01	1.06E-01	G
CS-137	3.0035E-02						
		661.62	3.003E-02	(P	3.295E-02	1.05E-02	G
CE-139	7.6987E-03						
		165.85	7.699E-03	&(	4.319E-02	1.29E-02	G
EU-152	8.8706E-02						
		121.78	1.924E-02	%(P	1.440E-01	4.31E-02	G K
		344.30	-3.335E-03	% P	1.120E-01	3.29E-02	G
		1408.08	-9.415E-03	%	1.326E-01	3.65E-02	G
		964.00	2.280E-01	(P	2.757E-01	8.69E-02	G
		1112.07	1.030E-01	%	2.599E-01	7.79E-02	G
		778.90	5.204E-02	%	2.222E-01	6.51E-02	G
EU-154	-6.6773E-03						
		123.10	-6.677E-03	%(	1.070E-01	3.19E-02	G K
		1274.80	-3.318E-04	%	1.218E-01	3.45E-02	G
		723.30	-4.599E-02	%	1.926E-01	5.70E-02	G
		1004.80	-5.497E-02	&	2.334E-01	6.87E-02	G
EU-155	8.9531E-02						
		86.45	8.953E-02	%(	2.310E-01	6.98E-02	G K
		105.31	-2.733E-02	&	1.858E-01	5.55E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
HG-203	-1.0547E-03						
		279.17	-1.055E-03	&(P	3.988E-02	1.18E-02	G K
		72.87	-1.992E-01	% P	2.130E+00	6.37E-01	G
		70.83	-2.891E-01	%	3.899E+00	1.16E+00	G
		82.50	-6.725E-01	%	3.759E+00	1.13E+00	G
TL-208	2.3378E-01						
		583.14	2.338E-01	(P	4.069E-02	1.93E-02	G
		510.72	3.764E-01	+ P	1.703E-01	6.88E-02	G
PB-212	7.4833E-01						
		238.63	7.199E-01	(P	9.059E-02	3.84E-02	G K
							Energy duplication
		77.11	7.483E-01	} P	3.600E-01	9.34E-02	G
		74.81	9.734E-01	+ P	7.298E-01	2.32E-01	G
PB-214	4.5216E-01						
		351.99	4.550E-01	(P	9.691E-02	4.35E-02	G K
		295.22	4.466E-01	(P	1.503E-01	5.68E-02	G
							Energy duplication
		77.11	1.345E-02	} P	7.851E-01	1.90E-01	G
		241.92	-2.382E-02	%	6.256E-01	1.87E-01	G
BI-212	7.1728E-01						
		727.17	7.173E-01	(P	3.121E-01	1.37E-01	G K
		1620.56	-3.155E-03	% P	9.318E-01	2.44E-01	G
		785.42	3.529E-01	%	1.675E+00	4.91E-01	G
BI-214	4.5666E-01						
		609.32	4.567E-01	(P	6.812E-02	3.30E-02	G K
		1764.51	5.726E-01	+ P	1.705E-01	9.22E-02	G
		1120.28	6.334E-01	+ P	3.285E-01	1.44E-01	G
RA-224	9.0677E-01						
		241.00	9.068E-01	(	1.018E+00	3.14E-01	G
RA-226	1.0150E+00						
		185.99	1.015E+00	*(P	1.057E+00	3.26E-01	G
AC-228	6.5083E-01						
		911.07	6.594E-01	(P	9.820E-02	5.33E-02	G K
		968.90	6.284E-01	(P	1.637E-01	7.23E-02	G
		338.40	6.626E-01	(P	1.960E-01	7.42E-02	G
TH-227	-1.5227E-01						
		236.00	-1.523E-01	%(	3.771E-01	1.14E-01	G K
		256.25	1.263E-02	% P	4.494E-01	1.33E-01	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments

PA-234       1.0812E-02
                           98.44 1.081E-02 &(P 2.115E-01 6.30E-02 G K
                          946.00 3.998E-03 % P 1.723E-01 4.89E-02 G
                          131.28 4.324E-02 % P 2.023E-01 6.07E-02 G
                           94.67-1.498E-01 % P 3.947E-01 1.19E-01 G
                          883.24-3.781E-03 &   2.294E-01 6.42E-02 G
                          926.70 1.637E-03 &   2.802E-01 7.88E-02 G
                          569.26-3.165E-02 & P 3.043E-01 8.78E-02 G

TH-234       1.1362E+00
                           63.29 7.856E-01 %(P 6.334E+00 1.89E+00 G K
                                                          Energy duplication
                           92.80 1.592E+00 @(P 2.070E+00 6.32E-01 G
                           92.38-1.892E-01 % P 2.371E+00 7.00E-01 G

AM-241       2.5143E-01
                           59.54 2.514E-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	5.5360E-02	5.6985E-02	2.3944E-01	2.3946E-01	2.630E-01
K-40		1.4671E+01	1.4671E+01	1.2461E+00	1.5094E+00	
MN-54	#A	2.6735E-02	2.6868E-02	2.7114E-02	2.7159E-02	2.767E-02
CO-57	#B	5.0874E-03	5.1166E-03	4.4359E-02	4.4360E-02	4.920E-02
CO-60	#B	1.5772E-02	1.5784E-02	3.1623E-02	3.1636E-02	3.541E-02
Sr-85	#A	-1.0498E-02	-1.0751E-02	3.5930E-02	3.5936E-02	3.919E-02
Kr-85	#A	-2.4213E+02	-2.4213E+02	8.0993E+02	8.1005E+02	9.048E+02
Y-88	#B	-2.9546E-03	-2.9977E-03	2.3776E-02	2.3777E-02	2.721E-02
NB-94	#B	4.8838E-03	4.8838E-03	2.3886E-02	2.3888E-02	2.760E-02
Ag-108M	#B	-1.0504E-02	-1.0505E-02	3.8126E-02	3.8130E-02	4.291E-02
CD-109	#A	6.4757E-01	6.4978E-01	1.6680E+00	1.6684E+00	1.836E+00
SN-113	#B	5.9330E-03	6.0132E-03	4.0713E-02	4.0714E-02	4.545E-02
SB-125	#F	9.5758E-02	9.5905E-02	8.6458E-02	8.6637E-02	8.840E-02
I-131	#B	1.9090E-04	2.3132E-04	4.3299E-02	4.3299E-02	4.062E-02
CS-134	#B	-1.7375E-02	-1.7411E-02	3.4927E-02	3.4942E-02	3.841E-02
CS-137	#A	3.0030E-02	3.0035E-02	3.1477E-02	3.1526E-02	3.294E-02
CE-139	#A	7.6127E-03	7.6987E-03	3.8788E-02	3.8791E-02	4.271E-02
EU-152	#B	8.8677E-02	8.8706E-02	1.0140E-01	1.0152E-01	1.439E-01
EU-154	#B	-6.6740E-03	-6.6773E-03	9.5799E-02	9.5800E-02	1.069E-01
EU-155	#B	8.9455E-02	8.9531E-02	2.0948E-01	2.0954E-01	2.308E-01
HG-203	#B	-1.0203E-03	-1.0547E-03	3.6425E-02	3.6425E-02	3.858E-02
TL-208		2.3378E-01	2.3378E-01	5.7895E-02	5.9464E-02	
PB-212		7.4833E-01	7.4833E-01	1.1977E-01	1.2740E-01	
PB-214		4.5216E-01	4.5216E-01	1.0792E-01	1.1106E-01	
BI-212		7.1728E-01	7.1728E-01	4.1097E-01	4.1307E-01	
BI-214		4.5666E-01	4.5666E-01	9.9038E-02	1.0253E-01	
RA-224	#A	9.0677E-01	9.0677E-01	9.4232E-01	9.4379E-01	1.018E+00
RA-226	#A	1.0150E+00	1.0150E+00	9.7713E-01	9.7890E-01	1.057E+00
AC-228		6.5083E-01	6.5083E-01	1.1699E-01	1.2294E-01	
TH-227	#B	-1.5227E-01	-1.5227E-01	3.4210E-01	3.4222E-01	3.771E-01
PA-234	#B	1.0812E-02	1.0812E-02	1.8912E-01	1.8912E-01	2.115E-01
TH-234	#B	1.1362E+00	1.1362E+00	1.3529E+00	1.3543E+00	6.334E+00
AM-241	#A	2.5143E-01	2.5143E-01	9.2960E-01	9.2970E-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 (1120.0 to 2000.7 keV) 1.7930058E+01 pCi/gm
Total Decayed Activity (1120.0 to 2000.7 keV) 1.7930058E+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_29JUN2006_1551.An1

Sample description
FSS-OOL-10-03-003-F

Spectrum Filename: C:\GammaVision\Spectra\103F_29JUN2006_1551.An1

Acquisition information
Start time: 29-Jun-2006 15:51:39
Live time: 2000
Real time: 2003
Dead time: 0.12 %
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: 2.0260E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 2.0260E+03) =
4.9358E+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	26-Jun-2006 14:30:00
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. 17 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.2753

***** 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	150.	20.14	0.99	9.160E-03	74.81	9.600	1.131E+00	PB212
77.28	232.	12.88	0.99	1.025E-02	77.11	17.500	8.643E-01	PB212
					77.11	10.700	1.413E+00	PB214
87.23	104.	29.92	1.00	1.454E-02				
87.23	104.	29.92	1.00	1.454E-02	88.04	3.790	1.254E+00	CD109
90.07	79.	41.65	1.00	1.561E-02				
93.32	122.	26.60	1.00	1.675E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
186.20	215.	20.76	1.18	2.566E-02	185.99	3.280	1.601E+00	RA226
209.92	99.	37.82	1.62	2.468E-02				
238.82	1262.	3.39	1.09	2.319E-02	238.63	43.100	8.340E-01	PB212
241.45	180.	20.02	1.09	2.305E-02	241.00	3.900	1.334E+00	RA224
					241.92	7.470	6.980E-01	PB214
277.98	93.	33.88	1.03	2.111E-02				
277.98	93.	33.88	1.03	2.111E-02	279.17	81.500	3.783E-02	HG203
295.42	285.	10.42	0.91	2.024E-02	295.22	19.200	4.817E-01	PB214
300.62	121.	25.66	1.23	1.999E-02				
328.38	104.	28.57	1.11	1.873E-02				
338.44	268.	11.98	1.30	1.830E-02	338.40	12.010	8.094E-01	AC228
352.06	602.	6.03	1.16	1.775E-02	351.99	37.100	6.043E-01	PB214
463.01	90.	22.28	1.14	1.426E-02				
463.01	90.	22.28	1.14	1.426E-02	463.51	10.000	4.144E-01	SB125
511.14	199.	13.39	1.31	1.316E-02	510.72	22.500	3.885E-01	TL208
583.37	477.	6.52	1.09	1.184E-02	583.14	86.000	3.095E-01	TL208
609.61	416.	6.93	1.50	1.143E-02	609.32	46.090	5.181E-01	BI214
727.59	118.	20.18	1.58	9.960E-03	727.17	11.800	6.666E-01	BI212
786.03	34.	40.96	1.50	9.394E-03	785.42	2.000	PBC<MDA	BI212

795.35	47.	28.78	1.28	9.305E-03				
795.35	47.	28.78	1.28	9.305E-03	795.76	85.400	3.934E-02	CS134
860.82	52.	26.14	0.92	8.766E-03				
879.60	39.	40.00	0.94	8.625E-03				
911.66	259.	8.91	1.53	8.397E-03	911.07	29.000	6.993E-01	AC228
965.18	58.	23.08	1.54	8.049E-03				
969.43	154.	10.68	1.54	8.023E-03	968.90	17.460	7.337E-01	AC228
1120.92	137.	16.93	1.10	7.209E-03	1120.28	15.040	8.321E-01	BI214
1461.49	1780.	2.43	1.97	5.930E-03	1460.75	10.700	1.851E+01	K40
1621.72	20.	26.09	0.69	5.488E-03	1620.56	2.750	8.997E-01	BI212

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
1765.35	82.	10.85	1.50	5.142E-03	1764.51	15.920	6.660E-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	
173.64	87.58	436.	104.	0.052	89.75	1.001	PB-214	lD
179.31	90.41	507.	79.	0.040	124.94	1.003	PB-214	lD
419.00	209.92	564.	99.	0.049	113.47	1.619	NP-239	s
600.39	300.62	323.	121.	0.060	76.99	1.230	PB-212	s
655.89	328.38	301.	104.	0.052	85.71	1.108	RH-106M	s
1720.68	860.82	57.	52.	0.026	78.42	0.918	TL-208	s
1758.24	879.60	72.	41.	0.021	99.00	0.939	CE-143	s
1930.18	965.12	58.	60.	0.030	65.85	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	332.	149.	0.075	55.97	0.993D
PB-212	153.39	77.11	413.	168.	0.084	46.65	0.995A
TH-234	185.34	93.08	1189.	129.	0.064	102.19	1.500s
TH-234	185.29	93.06	1176.	130.	0.065	101.17	1.500s
RA-226	371.56	186.20	724.	202.	0.101	62.28	1.181s
PB-212	476.87	238.86	736.	1270.	0.635	13.02	1.047
RA-224	482.55	241.70	861.	173.	0.086	75.56	1.500
PB-214	482.02	241.43	419.	70.	0.035	123.40	1.475s
HG-203	554.63	277.74	355.	77.	0.038	109.63	1.500s
PB-214	589.99	295.42	275.	281.	0.140	31.27	0.914
AC-228	676.01	338.44	283.	267.	0.133	35.95	1.301s
PB-214	703.26	352.06	261.	597.	0.298	18.08	1.155
SB-125	925.23	463.05	193.	84.	0.042	75.78	1.500
TL-208	1021.39	511.14	203.	173.	0.086	40.16	1.306s
TL-208	1165.85	583.37	148.	473.	0.236	19.55	1.093
BI-214	1218.32	609.61	144.	410.	0.205	20.78	1.498
BI-212	1454.25	727.59	132.	118.	0.059	60.53	1.584
BI-212	1571.13	786.03	82.	34.	0.017	122.88	1.500
CS-134	1589.64	795.29	70.	46.	0.023	88.24	1.500s
AC-228	1822.34	911.66	92.	255.	0.128	26.74	1.534s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
AC-228	1936.81	968.90	61.	154.	0.077	32.26	1.541D
BI-214	2240.69	1120.86	119.	125.	0.062	54.99	1.098s
K-40	2921.84	1461.49	38.	1762.	0.881	7.30	1.972
BI-212	3242.25	1621.72	4.	20.	0.010	78.26	0.694s
BI-214	3529.45	1765.35	3.	82.	0.041	32.54	1.500s

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		3.3948E-02					
			477.56	3.395E-02	%(	3.203E-01 9.41E-02 G	
K-40		1.8514E+01					
			1460.75	1.851E+01	(P	3.312E-01 4.55E-01 G	
MN-54		-1.3821E-02					
			834.81	-1.382E-02	&(P	3.977E-02 1.19E-02 G	
CO-57		-2.3162E-03					
			122.07	-2.316E-03	&(P	5.231E-02 1.56E-02 G K	
			136.43	1.997E-02	%	3.924E-01 1.17E-01 G	
CO-60		4.6062E-03					
			1332.51	4.606E-03	&(P	3.327E-02 9.34E-03 G K	
			1173.23	-1.867E-03	& P	5.790E-02 1.67E-02 G K	
Sr-85		-1.1814E-02					
			514.00	-1.181E-02	%(	4.275E-02 1.28E-02 G	
Kr-85		-2.6398E+02					
			513.99	-2.640E+02	%(	9.553E+02 2.86E+02 G	
Y-88		2.8144E-03					
			1836.01	2.814E-03	%(P	2.325E-02 6.24E-03 G K	
			898.02	6.042E-03	% P	3.741E-02 1.09E-02 G	
NB-94		-3.6824E-03					
			871.10	-3.682E-03	&(	3.321E-02 9.60E-03 G K	
			702.50	3.096E-03	&	3.166E-02 9.18E-03 G K	

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
Ag-108M	-8.4312E-03						
		722.95	-8.431E-03	%(	4.424E-02	1.31E-02	G K
		614.37	1.122E-04	& P	3.452E-02	9.94E-03	G
		433.93	5.373E-05	&	3.334E-02	9.71E-03	G
CD-109	1.0792E+00						
		88.04	1.079E+00	%(	1.859E+00	5.66E-01	G
SN-113	-1.7678E-03						
		391.71	-1.768E-03	&(	5.037E-02	1.48E-02	G K
		255.04	8.365E-03	&	1.329E+00	3.91E-01	G
SB-125	1.1687E-01						
		427.95	2.246E-02	%(P	9.820E-02	2.92E-02	G K
		600.77	-2.656E-03	% P	1.730E-01	5.00E-02	G
		636.15	-2.796E-02	& P	2.826E-01	8.19E-02	G
		463.51	3.963E-01	(P	3.164E-01	1.02E-01	G
		176.29	-1.325E-01	%	5.899E-01	1.77E-01	G
I-131	-7.2827E-03						
		364.48	-7.283E-03	&(P	4.961E-02	1.47E-02	G K
		636.97	-1.475E-01	&	6.177E-01	1.83E-01	G
		284.29	-1.212E-02	% P	6.665E-01	1.97E-01	G
CS-134	1.0176E-02						
		604.66	-1.498E-02	%(	3.732E-02	1.12E-02	G K
		795.76	3.892E-02	(P	3.504E-02	1.15E-02	G
		569.29	-7.247E-03	% P	1.949E-01	5.58E-02	G
		801.84	-1.356E-02	% P	4.393E-01	1.26E-01	G
CS-137	5.2903E-03						
		661.62	5.290E-03	%(P	3.806E-02	1.11E-02	G
CE-139	-3.7572E-03						
		165.85	-3.757E-03	%(	4.703E-02	1.40E-02	G
EU-152	-6.6513E-03						
		121.78	-6.651E-03	%(P	1.480E-01	4.42E-02	G K
		344.30	-1.597E-03	% P	1.169E-01	3.44E-02	G
		1408.08	2.943E-02	%	1.510E-01	4.34E-02	G
		964.00	4.762E-02	% P	2.686E-01	7.85E-02	G
		1112.07	1.212E-01	&	3.326E-01	9.96E-02	G
		778.90	-8.878E-05	&	2.266E-01	6.43E-02	G
EU-154	-8.5712E-03						
		123.10	-8.571E-03	%(	8.595E-02	2.56E-02	G K
		1274.80	-1.248E-02	&	1.244E-01	3.59E-02	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          723.30-4.350E-02 %   2.084E-01 6.17E-02 G
                         1004.80-3.463E-02 %   2.196E-01 6.40E-02 G

EU-155       8.1004E-04
                           86.45 8.100E-04 &(  2.288E-01 6.83E-02 G K
                          105.31 6.495E-02 %   2.285E-01 6.88E-02 G

HG-203       3.1224E-02
                          279.17 3.122E-02 *(P 3.684E-02 1.14E-02 G K
                           72.87 4.372E-01 % P 1.697E+00 5.10E-01 G
                           70.83 4.160E-01 &   4.157E+00 1.24E+00 G
                           82.50 5.754E-02 &   3.963E+00 1.18E+00 G

TL-208       3.0952E-01
                          583.14 3.095E-01  (P 3.893E-02 2.04E-02 G
                          510.72 3.885E-01 + P 1.557E-01 6.01E-02 G

PB-212       8.5311E-01
                          238.63 8.469E-01  (P 8.617E-02 3.71E-02 G K
                                                          Energy duplication
                           77.11 6.346E-01 } P 3.669E-01 9.87E-02 G
                           74.81 1.147E+00 + P 6.725E-01 2.18E-01 G

PB-214       6.0435E-01
                          351.99 6.043E-01  (P 7.902E-02 3.68E-02 G K
                          295.22 4.817E-01 - P 1.373E-01 5.10E-02 G
                                                          Energy duplication
                           77.11 2.222E-01 } P 8.496E-01 2.33E-01 G
                          241.92 2.707E-01 -   3.806E-01 1.11E-01 G

BI-212       7.7192E-01
                          727.17 6.666E-01  (P 3.196E-01 1.35E-01 G K
                         1620.56 8.997E-01  (P 5.130E-01 2.35E-01 G
                          785.42 1.218E+00 ?(  1.590E+00 4.99E-01 G

BI-214       5.1809E-01
                          609.32 5.181E-01  (P 7.429E-02 3.65E-02 G K
                         1764.51 6.660E-01 + P 9.077E-02 7.52E-02 G
                         1120.28 7.663E-01 + P 3.298E-01 1.43E-01 G

RA-224       1.2811E+00
                          241.00 1.281E+00  (  1.034E+00 3.23E-01 G

RA-226       1.6008E+00
                          185.99 1.601E+00  (P 1.015E+00 3.54E-01 G

AC-228       7.3234E-01
                          911.07 6.993E-01 @(P 1.295E-01 6.32E-02 G K
                          968.90 7.342E-01  (P 1.858E-01 7.90E-02 G
                          338.40 8.094E-01 @(P 2.462E-01 9.74E-02 G
```

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments

TH-227      -1.3275E-01
                          236.00-1.328E-01 %(  3.587E-01 1.08E-01 G K
                          256.25 1.991E-01 % P 4.495E-01 1.36E-01 G

PA-234      -2.9883E-03
                           98.44-2.988E-03 %(P 2.270E-01 6.77E-02 G K
                          946.00-8.622E-05 % P 2.247E-01 6.48E-02 G
                          131.28-1.969E-02 % P 2.113E-01 6.32E-02 G
                           94.67-1.895E-01 % P 4.209E-01 1.28E-01 G
                          883.24-1.295E-02 &   2.691E-01 7.69E-02 G
                          926.70 1.155E-01 &   2.486E-01 7.53E-02 G
                          569.26-1.079E-02 % P 2.983E-01 8.57E-02 G

TH-234       1.5108E+00
                           63.29 9.705E-01 %(P 6.009E+00 1.80E+00 G K
                           92.80 1.751E+00  (P 2.197E+00 6.71E-01 G
                           92.38 2.051E+00  (P 2.601E+00 7.94E-01 G

AM-241      -2.0000E-01
                           59.54-2.000E-01 %(P 1.154E+00 3.46E-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	3.2627E-02	3.3948E-02	2.8230E-01	2.8230E-01	3.078E-01
K-40		1.8514E+01	1.8514E+01	1.3655E+00	1.7378E+00	
MN-54	#A	-1.3727E-02	-1.3821E-02	3.7018E-02	3.7027E-02	3.950E-02
CO-57	#B	-2.2981E-03	-2.3162E-03	5.3094E-02	5.3094E-02	5.191E-02
CO-60	#B	4.6011E-03	4.6062E-03	2.8007E-02	2.8008E-02	3.324E-02
Sr-85	#A	-1.1434E-02	-1.1814E-02	3.8360E-02	3.8366E-02	4.138E-02
Kr-85	#A	-2.6398E+02	-2.6398E+02	8.5711E+02	8.5725E+02	9.553E+02
Y-88	#B	2.7590E-03	2.8144E-03	1.8706E-02	1.8706E-02	2.280E-02
NB-94	#B	-3.6824E-03	-3.6824E-03	2.8786E-02	2.8786E-02	3.321E-02
Ag-108M	#B	-8.4308E-03	-8.4312E-03	3.9180E-02	3.9183E-02	4.424E-02
CD-109	#A	1.0742E+00	1.0792E+00	1.6971E+00	1.6982E+00	1.850E+00
SN-113	#B	-1.7356E-03	-1.7678E-03	4.4376E-02	4.4376E-02	4.945E-02
SB-125	#F	1.1663E-01	1.1687E-01	8.9897E-02	9.0153E-02	9.799E-02
I-131	#B	-5.5956E-03	-7.2827E-03	4.9452E-02	4.9453E-02	3.811E-02
CS-134	#B	1.0148E-02	1.0176E-02	8.9967E-03	9.0161E-03	3.721E-02
CS-137	#A	5.2893E-03	5.2903E-03	3.3265E-02	3.3267E-02	3.805E-02
CE-139	#A	-3.6998E-03	-3.7572E-03	4.2148E-02	4.2148E-02	4.631E-02
EU-152	#B	-6.6483E-03	-6.6513E-03	1.7559E-01	1.7559E-01	1.479E-01
EU-154	#B	-8.5653E-03	-8.5712E-03	7.6878E-02	7.6880E-02	8.589E-02
EU-155	#B	8.0909E-04	8.1004E-04	2.0481E-01	2.0481E-01	2.286E-01
HG-203	#A	2.9836E-02	3.1224E-02	3.4249E-02	3.4297E-02	3.520E-02
TL-208		3.0952E-01	3.0952E-01	6.1073E-02	6.3662E-02	
PB-212		8.5311E-01	8.5311E-01	1.1211E-01	1.2257E-01	
PB-214		6.0435E-01	6.0435E-01	1.1030E-01	1.1575E-01	
BI-212		7.7192E-01	7.7192E-01	4.0639E-01	4.0886E-01	
BI-214		5.1809E-01	5.1809E-01	1.0934E-01	1.1340E-01	
RA-224		1.2811E+00	1.2811E+00	9.6797E-01	9.7082E-01	1.034E+00
RA-226	#	1.6008E+00	1.6008E+00	1.0610E+00	1.0651E+00	
AC-228		7.3234E-01	7.3234E-01	1.3547E-01	1.4198E-01	
TH-227	#B	-1.3275E-01	-1.3275E-01	3.2500E-01	3.2509E-01	3.587E-01
PA-234	#B	-2.9883E-03	-2.9883E-03	5.8094E-01	5.8094E-01	2.270E-01
TH-234	#B	1.5108E+00	1.5108E+00	1.7367E+00	1.7387E+00	6.009E+00
AM-241	#A	-2.0000E-01	-2.0000E-01	1.0542E+00	1.0542E+00	1.154E+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) 2.5184965E+01 pCi/gm
Total Decayed Activity (1120.0 to 2000.7 keV) 2.5184971E+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_29JUN2006_1634.An1

Sample description
FSS-OOL-10-03-033-F-B

Spectrum Filename: C:\GammaVision\Spectra\103F_29JUN2006_1634.An1

Acquisition information
Start time: 29-Jun-2006 16:34:20
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: 2.0250E+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	26-Jun-2006 16:30:00
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. 15 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.2794

***** 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	100.	27.19	0.99	9.052E-03	74.81	9.600	7.703E-01	PB212
77.28	165.	16.96	0.99	1.031E-02	77.11	10.700	1.001E+00	PB214
					77.11	17.500	6.120E-01	PB212
186.50	148.	25.14	0.97	2.565E-02	185.99	3.280	1.067E+00	RA226
238.81	979.	3.76	1.09	2.319E-02	238.63	43.100	6.455E-01	PB212
241.69	158.	16.32	1.09	2.304E-02	241.00	3.900	1.173E+00	RA224
					241.92	7.470	6.137E-01	PB214
270.30	102.	21.03	1.58	2.151E-02				
295.32	205.	11.41	1.10	2.024E-02	295.22	19.200	3.449E-01	PB214
300.88	85.	31.13	1.07	1.998E-02				
338.51	242.	11.17	1.21	1.830E-02	338.40	12.010	7.329E-01	AC228
352.11	426.	6.75	1.21	1.775E-02	351.99	37.100	4.264E-01	PB214
463.17	79.	19.40	1.85	1.425E-02				
463.17	79.	19.40	1.85	1.425E-02	463.51	10.000	3.648E-01	SB125
511.09	184.	11.79	1.58	1.317E-02	510.72	22.500	3.533E-01	TL208
583.47	333.	7.43	1.09	1.184E-02	583.14	86.000	2.155E-01	TL208
609.59	297.	8.65	1.23	1.144E-02	609.32	46.090	3.682E-01	BI214
728.11	115.	15.49	1.98	9.955E-03	727.17	11.800	6.493E-01	BI212
768.47	70.	32.24	1.05	9.552E-03				
795.18	58.	31.49	1.70	9.306E-03				
795.18	58.	31.49	1.70	9.306E-03	795.76	85.400	4.862E-02	CS134
911.45	224.	10.59	1.28	8.399E-03	911.07	29.000	6.049E-01	AC228
969.19	181.	14.22	1.55	8.024E-03	968.90	17.460	8.622E-01	AC228
1121.05	104.	20.57	1.54	7.208E-03	1120.28	15.040	6.251E-01	BI214
1461.49	1393.	2.79	2.12	5.930E-03	1460.75	10.700	1.445E+01	K40
1765.48	50.	13.74	1.35	5.142E-03	1764.51	15.920	4.054E-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	
539.75	270.30	179.	102.	0.051	63.08	1.575	AC-228	s
600.92	300.88	246.	85.	0.043	93.38	1.066	PB-212	
1536.01	768.47	128.	70.	0.035	96.73	1.053	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	148.79	74.81	347.	100.	0.050	81.58	0.993D
PB-212	153.39	77.11	336.	159.	0.080	42.35	0.995A
RA-226	371.76	186.30	677.	126.	0.063	82.55	1.500s
PB-212	476.86	238.85	564.	981.	0.491	14.72	0.989
RA-224	482.45	241.65	695.	146.	0.073	80.31	1.500
PB-214	482.47	241.65	312.	63.	0.031	116.38	1.336s
PB-214	589.79	295.32	175.	201.	0.100	34.23	1.102
AC-228	676.17	338.51	198.	241.	0.121	33.51	1.212s
PB-214	703.36	352.11	166.	421.	0.210	20.24	1.214
SB-125	925.48	463.18	129.	70.	0.035	75.82	1.500s
TL-208	1021.29	511.09	132.	157.	0.078	35.36	1.579s
TL-208	1166.04	583.47	108.	329.	0.164	22.29	1.089
BI-214	1218.27	609.59	124.	291.	0.145	25.95	1.228
BI-212	1455.29	728.11	66.	114.	0.057	46.47	1.977s
CS-134	1589.64	795.29	60.	49.	0.025	79.00	1.500
AC-228	1821.94	911.45	95.	221.	0.110	31.77	1.285s
AC-228	1937.39	969.19	118.	181.	0.091	42.67	1.549
BI-214	2241.07	1121.05	96.	102.	0.051	61.70	1.542s
K-40	2921.85	1461.49	45.	1374.	0.687	8.38	2.122
BI-214	3529.71	1765.48	3.	50.	0.025	41.21	1.350s

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		4.7841E-03					
			477.56	4.784E-03	%(	2.475E-01 7.13E-02	G
K-40		1.4450E+01					
			1460.75	1.445E+01	(P	3.558E-01 4.09E-01	G
MN-54		-2.6799E-04					
			834.81	-2.680E-04	%(P	2.876E-02 8.09E-03	G
CO-57		8.2264E-03					
			122.07	8.226E-03	&(P	3.869E-02 1.16E-02	G K
			136.43	1.700E-02	%	3.537E-01 1.05E-01	G
CO-60		-4.3590E-05					
			1332.51	-4.359E-05	%(P	3.282E-02 8.93E-03	G K
			1173.23	2.280E-02	% P	4.225E-02 1.28E-02	G K
Sr-85		-1.4370E-02					
			514.00	-1.437E-02	%(	3.758E-02 1.13E-02	G
Kr-85		-3.2131E+02					
			513.99	-3.213E+02	%(	8.401E+02 2.53E+02	G
Y-88		2.4213E-03					
			1836.01	2.421E-03	%(P	1.700E-02 4.41E-03	G K
			898.02	6.336E-03	% P	3.220E-02 9.34E-03	G
NB-94		1.0907E-02					
			871.10	1.091E-02	%(	2.715E-02 8.14E-03	G K
			702.50	0.000E+00	&	2.969E-02 8.47E-03	G K
Ag-108M		7.8422E-04					
			722.95	7.842E-04	%(	5.510E-02 1.61E-02	G K
			614.37	-4.761E-03	% P	3.163E-02 9.23E-03	G
			433.93	5.882E-03	&	2.930E-02 8.66E-03	G
CD-109		9.2733E-01					
			88.04	9.273E-01	%(	1.687E+00 5.13E-01	G
SN-113		-6.9085E-04					
			391.71	-6.908E-04	&(	4.326E-02 1.26E-02	G K
			255.04	-3.132E-02	%	1.575E+00 4.66E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	9.0181E-02						
		427.95	9.265E-03	&(P	7.866E-02	2.29E-02	G K
		600.77	4.640E-02	% P	1.374E-01	4.09E-02	G
		636.15	-3.391E-03	% P	2.340E-01	6.63E-02	G
		463.51	3.297E-01	(P	2.610E-01	8.48E-02	G
		176.29	0.000E+00	&	5.049E-01	1.50E-01	G
I-131	1.7848E-03						
		364.48	1.785E-03	&(P	4.283E-02	1.25E-02	G K
		636.97	4.413E-02	%	4.491E-01	1.29E-01	G
		284.29	1.689E-01	& P	5.654E-01	1.69E-01	G
CS-134	1.9303E-02						
		604.66	-1.295E-04	%(	3.275E-02	9.45E-03	G K
		795.76	4.151E-02	(P	3.266E-02	1.10E-02	G
		569.29	5.136E-02	& P	1.806E-01	5.34E-02	G
		801.84	8.623E-03	& P	3.865E-01	1.10E-01	G
CS-137	8.4186E-03						
		661.62	8.419E-03	&(P	3.638E-02	1.07E-02	G
CE-139	-2.0529E-03						
		165.85	-2.053E-03	&(	4.052E-02	1.21E-02	G
EU-152	2.3652E-02						
		121.78	2.365E-02	&(P	1.268E-01	3.80E-02	G K
		344.30	1.061E-03	% P	8.461E-02	2.46E-02	G
		1408.08	6.342E-02	%	1.316E-01	4.00E-02	G
		964.00	1.449E-01	% P	2.909E-01	8.83E-02	G
		1112.07	1.159E-01	%	2.710E-01	8.16E-02	G
		778.90	-4.849E-02	%	2.696E-01	7.90E-02	G
EU-154	-2.0725E-02						
		123.10	-2.072E-02	%(	1.000E-01	3.00E-02	G K
		1274.80	5.120E-03	%	1.144E-01	3.26E-02	G
		723.30	-5.631E-02	%	2.021E-01	6.02E-02	G
		1004.80	1.015E-01	&	1.454E-01	4.59E-02	G
EU-155	1.0566E-01						
		86.45	1.057E-01	&(	2.149E-01	6.52E-02	G K
		105.31	5.173E-02	%	1.941E-01	5.83E-02	G
HG-203	-1.5684E-05						
		279.17	-1.568E-05	&(P	3.844E-02	1.13E-02	G K
		72.87	-3.719E-01	% P	2.003E+00	6.01E-01	G
		70.83	3.861E-01	&	3.805E+00	1.14E+00	G
		82.50	-1.882E-01	&	3.487E+00	1.04E+00	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	2.1553E-01						
		583.14	2.155E-01	(P	3.350E-02	1.62E-02	G
		510.72	3.533E-01	+ P	1.267E-01	4.87E-02	G
PB-212	6.4405E-01						
		238.63	6.548E-01	(P	7.567E-02	3.25E-02	G K
							Energy duplication
		77.11	6.000E-01	} P	3.323E-01	8.47E-02	G
		74.81	7.703E-01	+ P	6.872E-01	2.16E-01	G
PB-214	4.2642E-01						
		351.99	4.264E-01	(P	6.360E-02	2.92E-02	G K
		295.22	3.449E-01	- P	1.105E-01	4.02E-02	G
							Energy duplication
		77.11	0.000E+00	} P	8.119E-01	0.00E+00	G
		241.92	2.437E-01	-	3.300E-01	9.45E-02	G
BI-212	6.4930E-01						
		727.17	6.493E-01	*(P	2.296E-01	1.01E-01	G K
		1620.56	2.016E-01	% P	7.822E-01	2.22E-01	G
		785.42	2.871E-01	%	1.489E+00	4.34E-01	G
BI-214	3.7778E-01						
		609.32	3.682E-01	(P	6.913E-02	3.26E-02	G K
		1764.51	4.054E-01	(P	9.081E-02	5.94E-02	G
		1120.28	6.251E-01	+ P	2.982E-01	1.31E-01	G
RA-224	1.0859E+00						
		241.00	1.086E+00	(	9.312E-01	2.91E-01	G
RA-226	1.0009E+00						
		185.99	1.001E+00	(P	9.827E-01	3.04E-01	G
AC-228	6.4238E-01						
		911.07	6.049E-01	*(P	1.319E-01	6.51E-02	G K
		968.90	8.622E-01	+ P	2.539E-01	1.23E-01	G
		338.40	7.329E-01	@(P	2.071E-01	8.23E-02	G
TH-227	-2.6143E-01						
		236.00	-2.614E-01	%(	3.617E-01	1.11E-01	G K
		256.25	-3.052E-03	& P	4.386E-01	1.30E-01	G
PA-234	-2.4471E-02						
		98.44	-2.447E-02	%(P	1.836E-01	5.48E-02	G K
		946.00	-3.910E-03	& P	1.168E-01	3.23E-02	G
		131.28	-3.564E-03	& P	1.899E-01	5.65E-02	G
		94.67	-7.164E-02	& P	3.734E-01	1.12E-01	G
		883.24	4.237E-02	%	2.215E-01	6.41E-02	G
		926.70	1.705E-01	%	2.302E-01	7.30E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
		569.26	5.484E-02	% P	2.675E-01	7.84E-02	G
TH-234	1.3377E+00						
		63.29	1.338E+00	&(P	5.716E+00	1.71E+00	G K
		92.80	1.030E+00	% P	1.963E+00	5.94E-01	G
		92.38	1.160E+00	% P	2.346E+00	7.09E-01	G
AM-241	1.0321E-01						
		59.54	1.032E-01	%(P	9.792E-01	2.92E-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:	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	4.6012E-03	4.7841E-03	2.1388E-01	2.1388E-01	2.380E-01
K-40		1.4450E+01	1.4450E+01	1.2276E+00	1.4869E+00	
MN-54	#A	-2.6621E-04	-2.6799E-04	1.7357E-02	1.7357E-02	2.857E-02
CO-57	#B	8.1633E-03	8.2264E-03	3.4752E-02	3.4755E-02	3.839E-02
CO-60	#B	-4.3543E-05	-4.3590E-05	2.7636E-02	2.7636E-02	3.278E-02

Sr-85	#A	-1.3916E-02	-1.4370E-02	3.3929E-02	3.3939E-02	3.639E-02
Kr-85	#A	-3.2130E+02	-3.2131E+02	7.5855E+02	7.5878E+02	8.401E+02
Y-88	#B	2.3744E-03	2.4213E-03	1.3230E-02	1.3231E-02	1.667E-02
NB-94	#B	1.0907E-02	1.0907E-02	2.4417E-02	2.4425E-02	2.715E-02
Ag-108M	#B	7.8419E-04	7.8422E-04	4.8400E-02	4.8400E-02	5.510E-02
CD-109	#A	9.2308E-01	9.2733E-01	1.5394E+00	1.5402E+00	1.679E+00
SN-113	#B	-6.7847E-04	-6.9085E-04	3.7839E-02	3.7839E-02	4.249E-02
SB-125	#F	8.9996E-02	9.0181E-02	6.9614E-02	6.9811E-02	7.849E-02
I-131	#B	1.3777E-03	1.7848E-03	3.7578E-02	3.7579E-02	3.306E-02
CS-134	#B	1.9250E-02	1.9303E-02	1.5276E-02	1.5317E-02	3.265E-02
CS-137	#A	8.4170E-03	8.4186E-03	3.2077E-02	3.2081E-02	3.637E-02
CE-139	#A	-2.0221E-03	-2.0529E-03	3.6174E-02	3.6174E-02	3.991E-02
EU-152	#B	2.3641E-02	2.3652E-02	1.1394E-01	1.1395E-01	1.268E-01
EU-154	#B	-2.0711E-02	-2.0725E-02	9.0045E-02	9.0052E-02	9.993E-02
EU-155	#B	1.0554E-01	1.0566E-01	1.9563E-01	1.9572E-01	2.146E-01
HG-203	#B	-1.4999E-05	-1.5684E-05	2.6211E-03	2.6211E-03	3.676E-02
TL-208		2.1553E-01	2.1553E-01	4.8671E-02	5.0254E-02	
PB-212		6.4405E-01	6.4405E-01	9.5942E-02	1.0297E-01	
PB-214		4.2642E-01	4.2642E-01	8.7452E-02	9.0889E-02	
BI-212	#	6.4930E-01	6.4930E-01	3.0300E-01	3.0534E-01	
BI-214		3.7778E-01	3.7778E-01	9.6921E-02	9.9371E-02	
RA-224		1.0859E+00	1.0859E+00	8.7206E-01	8.7434E-01	9.312E-01
RA-226	#	1.0009E+00	1.0009E+00	9.1099E-01	9.1284E-01	9.827E-01
AC-228		6.4238E-01	6.4238E-01	1.4975E-01	1.5433E-01	
TH-227	#B	-2.6143E-01	-2.6143E-01	3.3214E-01	3.3249E-01	3.617E-01
PA-234	#B	-2.4471E-02	-2.4471E-02	1.8492E-01	1.8493E-01	1.836E-01
TH-234	#B	1.3377E+00	1.3377E+00	5.1349E+00	5.1354E+00	5.716E+00
AM-241	#A	1.0321E-01	1.0321E-01	8.7557E-01	8.7559E-01	9.791E-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) 1.8491236E+01 pCi/gm
Total Decayed Activity (92.9 to 2000.7 keV) 1.8491236E+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_29JUN2006_1711.An1

Sample description
FSS-OOL-10-03-023-F-B

Spectrum Filename: C:\GammaVision\Spectra\103F_29JUN2006_1711.An1

Acquisition information
Start time: 29-Jun-2006 17:11:46
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: 2.2610E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 2.2610E+03) =
4.4228E+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	26-Jun-2006 15:45:00
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. 20 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.2187

***** 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	127.	24.69	0.99	9.052E-03	74.81	9.600	8.750E-01	PB212
77.23	207.	12.70	0.99	1.011E-02	77.11	17.500	7.990E-01	PB212
					77.11	10.700	1.307E+00	PB214
87.05	100.	32.62	1.00	1.450E-02	86.45	32.740	1.299E-01	EU155
					88.04	3.790	1.079E+00	CD109
90.00	98.	35.10	1.00	1.561E-02				
93.26	154.	21.89	1.00	1.675E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
177.35	88.	39.95	1.07	2.590E-02				
186.57	194.	22.02	1.10	2.565E-02	185.99	3.280	1.284E+00	RA226
209.83	128.	29.46	1.04	2.469E-02				
238.79	1548.	2.99	1.09	2.319E-02	238.63	43.100	9.180E-01	PB212
241.48	177.	21.18	1.09	2.305E-02	241.00	3.900	1.173E+00	RA224
					241.92	7.470	6.139E-01	PB214
270.60	127.	24.83	1.70	2.149E-02				
277.10	115.	28.91	1.05	2.116E-02				
295.27	308.	10.97	0.95	2.025E-02	295.22	19.200	4.680E-01	PB214
300.68	119.	23.42	1.19	1.998E-02				
327.75	79.	36.94	1.03	1.875E-02				
338.46	354.	12.11	1.02	1.830E-02	338.40	12.010	9.583E-01	AC228
352.11	464.	8.92	1.25	1.775E-02	351.99	37.100	4.163E-01	PB214
409.71	49.	40.51	0.93	1.574E-02				
463.20	101.	19.25	1.05	1.425E-02				
463.20	101.	19.25	1.05	1.425E-02	463.51	10.000	4.192E-01	SB125
511.07	223.	13.79	1.24	1.317E-02	510.72	22.500	3.967E-01	TL208
583.47	567.	5.58	1.45	1.184E-02	583.14	86.000	3.303E-01	TL208
609.46	394.	6.84	1.48	1.144E-02	609.32	46.090	4.395E-01	BI214

727.20	145.	15.68	1.76	9.964E-03	727.17	11.800	7.345E-01	BI212
795.34	89.	20.05	1.67	9.305E-03				
795.34	89.	20.05	1.67	9.305E-03	795.76	85.400	6.709E-02	CS134
860.11	93.	19.44	1.73	8.771E-03				
911.69	358.	7.60	1.76	8.397E-03	911.07	29.000	8.705E-01	AC228
964.89	72.	17.46	1.54	8.050E-03	964.00	14.580	3.657E-01	EU152
969.50	209.	8.38	1.54	8.022E-03	968.90	17.460	8.914E-01	AC228
1120.59	96.	26.17	1.64	7.210E-03	1120.28	15.040	5.169E-01	BI214
1461.45	1633.	2.55	1.83	5.930E-03	1460.75	10.700	1.520E+01	K40
1620.82	35.	18.59	0.79	5.488E-03	1620.56	2.750	1.377E+00	BI212

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
1765.62	80.	12.68	2.44	5.142E-03	1764.51	15.920	5.836E-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	
173.27	87.46	485.	100.	0.050	97.87	1.001	PB-214	lD
179.18	90.41	543.	98.	0.049	105.29	1.002	PB-214	lD
418.82	209.83	588.	128.	0.064	88.37	1.042	NP-239	
540.35	270.60	380.	127.	0.064	74.48	1.702	AC-228	s
553.34	277.10	388.	123.	0.061	73.19	1.053	TL-208	s
600.51	300.68	286.	119.	0.060	70.26	1.185	PB-212	
654.64	327.75	309.	79.	0.040	110.81	1.031	AC-228	
818.55	409.71	160.	49.	0.025	121.54	0.930	AC-228	
1719.26	860.11	78.	93.	0.047	58.33	1.735	TL-208	s
1929.87	964.89	49.	67.	0.034	57.00	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	456.	127.	0.064	74.08	0.993D
PB-212	153.39	77.11	466.	207.	0.103	38.11	0.995A
TH-234	185.44	93.14	1281.	153.	0.076	91.49	1.500s
TH-234	185.42	93.12	1263.	150.	0.075	92.27	1.500s
RA-226	372.30	186.57	720.	181.	0.090	66.05	1.102
PB-212	476.42	238.63	313.	1540.	0.770	8.97	1.093D
PB-214	483.00	241.92	428.	124.	0.062	58.20	1.095A
PB-214	589.70	295.27	339.	304.	0.152	32.90	0.946
AC-228	676.06	338.46	450.	352.	0.176	36.34	1.021
PB-214	703.36	352.11	397.	459.	0.229	26.77	1.248
SB-125	925.64	463.26	181.	91.	0.046	68.80	1.500
TL-208	1021.26	511.07	253.	197.	0.098	41.36	1.239s
TL-208	1166.05	583.47	145.	563.	0.281	16.75	1.447
BI-214	1218.01	609.46	125.	388.	0.194	20.52	1.475
Ag-108M	1222.19	611.55	201.	-77.	-0.039	85.44	1.500
BI-212	1453.48	727.20	124.	145.	0.072	47.04	1.765s
CS-134	1589.66	795.30	69.	79.	0.040	55.74	1.500
AC-228	1822.41	911.69	116.	355.	0.177	22.81	1.759

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
AC-228	1936.81	968.90	49.	209.	0.104	25.17	1.541D
BI-214	2240.15	1120.59	138.	94.	0.047	78.51	1.637s
K-40	2921.76	1461.45	43.	1614.	0.807	7.64	1.826
BI-212	3240.46	1620.82	2.	35.	0.017	55.76	0.786s
BI-214	3529.99	1765.62	11.	80.	0.040	38.04	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		3.4320E-02					
			477.56	3.432E-02	%(	3.033E-01 8.93E-02 G	
K-40		1.5201E+01					
			1460.75	1.520E+01	(P	3.123E-01 3.92E-01 G	
MN-54		2.0427E-02					
			834.81	2.043E-02	&(P	2.914E-02 9.07E-03 G	
CO-57		2.5741E-03					
			122.07	2.574E-03	%(P	3.973E-02 1.18E-02 G K	
			136.43	-7.353E-02	%	3.832E-01 1.15E-01 G	
CO-60		-1.9588E-03					
			1332.51	-1.959E-03	%(P	3.731E-02 1.03E-02 G K	
			1173.23	8.650E-03	& P	4.487E-02 1.31E-02 G K	
Sr-85		-1.5619E-02					
			514.00	-1.562E-02	%(	4.019E-02 1.21E-02 G	
Kr-85		-3.4969E+02					
			513.99	-3.497E+02	%(	8.980E+02 2.71E+02 G	
Y-88		4.5758E-04					
			1836.01	4.576E-04	%(P	2.210E-02 5.74E-03 G K	
			898.02	-6.682E-03	% P	3.577E-02 1.04E-02 G	
NB-94		9.8724E-04					
			871.10	9.872E-04	&(	2.960E-02 8.46E-03 G K	
			702.50	8.719E-03	%	3.342E-02 9.92E-03 G K	

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
Ag-108M	-5.4523E-03						
		722.95	-5.452E-03	%(	3.883E-02	1.14E-02	G K
		614.37	-4.481E-02	+ P	4.006E-02	1.27E-02	G
		433.93	4.846E-03	%	3.186E-02	9.42E-03	G
CD-109	5.7280E-02						
		88.04	5.728E-02	&(	2.037E+00	6.10E-01	G
SN-113	-1.9254E-04						
		391.71	-1.925E-04	&(	3.990E-02	1.16E-02	G K
		255.04	-2.241E-01	%	1.561E+00	4.66E-01	G
SB-125	1.1219E-01						
		427.95	2.035E-02	%(P	9.336E-02	2.77E-02	G K
		600.77	5.944E-02	% P	1.557E-01	4.68E-02	G
		636.15	3.886E-02	& P	2.500E-01	7.31E-02	G
		463.51	3.840E-01	(P	2.746E-01	8.93E-02	G
		176.29	-1.135E-01	&	4.872E-01	1.46E-01	G
I-131	1.2750E-02						
		364.48	1.275E-02	&(P	4.222E-02	1.26E-02	G K
		636.97	0.000E+00	&	4.789E-01	1.37E-01	G
		284.29	-9.448E-04	% P	6.361E-01	1.88E-01	G
CS-134	2.7871E-02						
		604.66	0.000E+00	%(	5.543E-02	1.64E-02	G K
		795.76	5.972E-02	(P	3.122E-02	1.11E-02	G
		569.29	2.466E-02	& P	1.880E-01	5.50E-02	G
		801.84	-8.915E-02	% P	3.833E-01	1.12E-01	G
CS-137	2.0523E-02						
		661.62	2.052E-02	%(P	3.864E-02	1.17E-02	G
CE-139	0.0000E+00						
		165.85	0.000E+00	%(	4.571E-02	1.36E-02	G
EU-152	-2.8970E-03						
		121.78	-2.897E-03	%(P	1.389E-01	4.14E-02	G K
		344.30	-2.053E-02	% P	9.920E-02	2.95E-02	G
		1408.08	-3.232E-02	%	1.532E-01	4.44E-02	G
		964.00	1.428E-01	% P	2.917E-01	8.85E-02	G
		1112.07	0.000E+00	&	3.530E-01	1.02E-01	G
		778.90	1.010E-02	&	2.048E-01	5.86E-02	G
EU-154	-1.7038E-02						
		123.10	-1.704E-02	%(	1.064E-01	3.19E-02	G K
		1274.80	0.000E+00	%	9.052E-02	2.54E-02	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          723.30-2.862E-02 %   1.895E-01 5.58E-02 G
                         1004.80-3.205E-02 &   1.995E-01 5.82E-02 G

EU-155       7.2242E-02
                           86.45 7.224E-02 &(  2.299E-01 6.94E-02 G K
                          105.31 4.894E-02 %   2.155E-01 6.48E-02 G

HG-203      -9.0481E-03
                          279.17-9.048E-03 &(P 3.788E-02 1.13E-02 G K
                           72.87-8.079E-01 & P 2.191E+00 6.62E-01 G
                           70.83-1.599E-01 %   3.074E+00 9.15E-01 G
                           82.50-3.146E-03 %   3.805E+00 1.14E+00 G

TL-208       3.3033E-01
                          583.14 3.303E-01  (P 3.451E-02 1.86E-02 G
                          510.72 3.967E-01 + P 1.550E-01 6.21E-02 G

PB-212       9.1206E-01
                          238.63 9.203E-01  (P 5.090E-02 2.77E-02 G K
                                                          Energy duplication
                           77.11 6.988E-01 } P 3.490E-01 8.88E-02 G
                           74.81 8.750E-01  (P 7.028E-01 2.21E-01 G

PB-214       4.3075E-01
                          351.99 4.163E-01  (P 8.674E-02 3.76E-02 G K
                          295.22 4.680E-01  (P 1.360E-01 5.20E-02 G
                                                          Energy duplication
                           77.11 0.000E+00 } P 8.344E-01 0.00E+00 G
                          241.92 4.307E-01 }   3.445E-01 8.36E-02 G

BI-212       7.3452E-01
                          727.17 7.345E-01  (P 2.781E-01 1.16E-01 G K
                         1620.56 1.377E+00 + P 3.838E-01 2.56E-01 G
                          785.42 5.591E-01 %   1.604E+00 4.80E-01 G

BI-214       4.5857E-01
                          609.32 4.395E-01  (P 6.220E-02 3.06E-02 G K
                         1764.51 5.836E-01 + P 1.330E-01 7.71E-02 G
                         1120.28 5.169E-01 *(P 3.168E-01 1.38E-01 G

RA-224       7.6033E-01
                                                          Derived Ave Activity
                          241.00 7.603E-01 }(  1.137E+00 3.58E-01 G

RA-226       1.2839E+00
                          185.99 1.284E+00  (P 9.071E-01 3.03E-01 G

AC-228       8.9441E-01
                          911.07 8.705E-01  (P 1.299E-01 6.68E-02 G K
                          968.90 8.902E-01  (P 1.511E-01 7.47E-02 G
```

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          338.40 9.583E-01  (P 2.761E-01 1.16E-01 G

TH-227      -9.7060E-02
                          236.00-9.706E-02 &(  3.551E-01 1.07E-01 G K
                          256.25 1.551E-01 & P 4.196E-01 1.27E-01 G

PA-234       5.1418E-03
                           98.44 5.142E-03 %(P 2.004E-01 5.98E-02 G K
                          946.00-8.137E-03 % P 1.648E-01 4.73E-02 G
                          131.28-2.696E-02 & P 2.038E-01 6.11E-02 G
                           94.67 1.951E-01 % P 2.920E-01 8.92E-02 G
                          883.24 1.298E-02 &   2.810E-01 8.10E-02 G
                          926.70-5.122E-02 &   2.903E-01 8.47E-02 G
                          569.26 3.654E-02 & P 2.781E-01 8.13E-02 G

TH-234       2.1436E+00
                           63.29 2.373E+00 &(P 5.796E+00 1.75E+00 G K
                           92.80 1.817E+00  (P 2.039E+00 6.24E-01 G
                           92.38 2.177E+00 &(P 2.417E+00 7.41E-01 G

AM-241      -2.4090E-01
                           59.54-2.409E-01 %(P 1.068E+00 3.21E-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
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	3.2983E-02	3.4320E-02	2.6791E-01	2.6792E-01	2.915E-01
K-40		1.5201E+01	1.5201E+01	1.1746E+00	1.4692E+00	
MN-54	#A	2.0289E-02	2.0427E-02	2.7216E-02	2.7242E-02	2.894E-02
CO-57	#B	2.5540E-03	2.5741E-03	3.5527E-02	3.5527E-02	3.942E-02
CO-60	#B	-1.9567E-03	-1.9588E-03	2.5803E-01	2.5803E-01	3.727E-02
Sr-85	#A	-1.5116E-02	-1.5619E-02	3.6349E-02	3.6360E-02	3.890E-02
Kr-85	#A	-3.4968E+02	-3.4969E+02	8.1226E+02	8.1251E+02	8.980E+02
Y-88	#B	4.4857E-04	4.5758E-04	1.7209E-02	1.7209E-02	2.167E-02
NB-94	#B	9.8724E-04	9.8724E-04	2.5370E-02	2.5370E-02	2.960E-02
Ag-108M	#B	-5.4521E-03	-5.4523E-03	3.4199E-02	3.4201E-02	3.883E-02
CD-109	#A	5.7013E-02	5.7280E-02	1.8298E+00	1.8298E+00	2.028E+00
SN-113	#B	-1.8903E-04	-1.9254E-04	3.4904E-02	3.4904E-02	3.917E-02
SB-125	#F	1.1196E-01	1.1219E-01	7.8265E-02	7.8536E-02	9.317E-02
I-131	#B	9.7934E-03	1.2750E-02	3.7897E-02	3.7905E-02	3.243E-02
CS-134	#B	2.7793E-02	2.7871E-02	1.5553E-02	1.5637E-02	5.527E-02
CS-137	#A	2.0519E-02	2.0523E-02	3.5241E-02	3.5261E-02	3.863E-02
CE-139	#A	0.0000E+00	0.0000E+00	4.0902E-02	4.0902E-02	4.501E-02
EU-152	#B	-2.8957E-03	-2.8970E-03	2.2485E-01	2.2485E-01	1.388E-01
EU-154	#B	-1.7027E-02	-1.7038E-02	9.5832E-02	9.5837E-02	1.063E-01
EU-155	#B	7.2157E-02	7.2242E-02	2.0816E-01	2.0820E-01	2.296E-01
HG-203	#B	-8.6453E-03	-9.0481E-03	3.4128E-02	3.4132E-02	3.619E-02
TL-208		3.3033E-01	3.3033E-01	5.5759E-02	5.8965E-02	
PB-212		9.1206E-01	9.1206E-01	8.2473E-02	9.8009E-02	
PB-214		4.3075E-01	4.3075E-01	1.1674E-01	1.1939E-01	
BI-212		7.3452E-01	7.3452E-01	3.4673E-01	3.4934E-01	
BI-214		4.5857E-01	4.5857E-01	9.5657E-02	9.9293E-02	
RA-224	A	7.6033E-01	7.6033E-01	1.0513E+00	1.0523E+00	
RA-226		1.2839E+00	1.2839E+00	9.0872E-01	9.1177E-01	
AC-228		8.9441E-01	8.9441E-01	1.4887E-01	1.5767E-01	
TH-227	#B	-9.7060E-02	-9.7060E-02	3.2075E-01	3.2080E-01	3.551E-01
PA-234	#B	5.1418E-03	5.1418E-03	1.7940E-01	1.7940E-01	2.004E-01
TH-234	#B	2.1436E+00	2.1436E+00	1.8911E+00	1.8948E+00	5.796E+00
AM-241	#A	-2.4090E-01	-2.4090E-01	9.7432E-01	9.7441E-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 (1120.0 to 2000.7 keV) 2.1005489E+01 pCi/gm
Total Decayed Activity (1120.0 to 2000.7 keV) 2.1005493E+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_29JUN2006_1749.An1

Sample description
FSS-OOL-10-03-030-F-B

Spectrum Filename: C:\GammaVision\Spectra\103F_29JUN2006_1749.An1

Acquisition information
Start time: 29-Jun-2006 17:49:13
Live time: 2000
Real time: 2002
Dead time: 0.12 %
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: 1.5630E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.5630E+03) =
6.3980E+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	26-Jun-2006 16:15:00
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. 23 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.2905

***** 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	205.	15.86	0.99	9.052E-03	74.81	9.600	2.036E+00	PB212
77.22	273.	9.67	0.99	1.011E-02	77.11	17.500	1.478E+00	PB212
					77.11	10.700	2.417E+00	PB214
87.19	140.	34.98	1.50	1.410E-02	86.45	32.740	PBC<MDA	EU155
					88.04	3.790	2.186E+00	CD109
87.24	136.	34.66	1.50	1.472E-02	86.45	32.740	PBC<MDA	EU155
					88.04	3.790	2.124E+00	CD109
93.07	130.	33.21	1.50	1.645E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
93.08	132.	32.78	1.50	1.631E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
186.27	170.	25.91	1.02	2.566E-02	185.99	3.280	1.618E+00	RA226
209.82	135.	28.30	1.01	2.469E-02				
238.83	1737.	2.72	1.09	2.319E-02	238.63	43.100	1.491E+00	PB212
241.55	202.	18.48	1.09	2.305E-02	241.00	3.900	1.938E+00	RA224
					241.92	7.470	1.014E+00	PB214
270.46	189.	17.42	1.05	2.150E-02				
277.49	100.	30.54	1.06	2.114E-02				
295.38	261.	11.99	1.06	2.024E-02	295.22	19.200	5.714E-01	PB214
300.46	110.	20.34	1.13	2.000E-02				
328.15	110.	21.56	1.18	1.873E-02				
338.48	349.	9.77	1.13	1.830E-02	338.40	12.010	1.370E+00	AC228
352.17	428.	8.27	1.15	1.775E-02	351.99	37.100	5.539E-01	PB214
463.53	105.	16.44	1.60	1.425E-02	463.51	10.000	6.290E-01	SB125
511.16	236.	13.08	1.19	1.316E-02	510.72	22.500	6.121E-01	TL208
583.45	593.	5.46	1.34	1.184E-02	583.14	86.000	4.997E-01	TL208
609.52	350.	7.94	1.45	1.144E-02	609.32	46.090	5.633E-01	BI214

727.69	148.	16.37	1.23	9.959E-03	727.17	11.800	1.082E+00	BI212
794.94	87.	21.42	1.09	9.309E-03				
794.94	87.	21.42	1.09	9.309E-03	795.76	85.400	9.487E-02	CS134
836.40	51.	33.80	1.05	8.957E-03				
860.48	109.	23.86	1.20	8.768E-03				
911.68	346.	6.65	1.49	8.397E-03	911.07	29.000	1.216E+00	AC228
964.55	64.	21.37	1.54	8.052E-03	964.00	14.580	4.640E-01	EU152

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
969.45	222.	7.91	1.54	8.022E-03	968.90	17.460	1.368E+00	AC228
1120.68	83.	21.25	1.20	7.210E-03	1120.28	15.040	6.465E-01	BI214
1408.92	20.	40.36	1.81	6.096E-03	1408.08	21.210	PBC<MDA	EU152
1461.50	1347.	2.82	1.86	5.930E-03	1460.75	10.700	1.809E+01	K40
1589.84	88.	13.99	1.57	5.568E-03				
1622.18	33.	19.24	1.15	5.488E-03	1620.56	2.750	1.877E+00	BI212
1765.24	62.	13.30	2.33	5.140E-03	1764.51	15.920	6.203E-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	
418.81	209.82	550.	135.	0.067	84.90	1.013	NP-239	s
540.07	270.46	342.	189.	0.094	52.25	1.050	AC-228	s
554.14	277.49	335.	98.	0.049	84.95	1.060	NP-239	s
599.87	300.36	216.	134.	0.067	53.26	1.482	PB-212	s
655.44	328.15	217.	110.	0.055	64.67	1.183	AC-228	
1671.85	836.40	86.	51.	0.025	88.15	1.054	J-135	
1720.00	860.48	132.	109.	0.054	53.16	1.204	TL-208	
1929.31	964.63	44.	80.	0.040	48.28	1.538	AC-228	D
3178.50	1589.84	12.	88.	0.044	41.96	1.573	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	442.	205.	0.102	47.59	0.993D
PB-212	153.39	77.11	445.	273.	0.137	29.02	0.995A
EU-155	173.56	87.19	1136.	140.	0.070	104.94	1.500
CD-109	173.65	87.24	1050.	136.	0.068	103.98	1.500
TH-234	185.33	93.08	1152.	132.	0.066	98.34	1.500s
TH-234	185.31	93.07	1142.	130.	0.065	99.64	1.500s
RA-226	371.71	186.27	725.	158.	0.079	77.73	1.025s
PB-212	476.87	238.86	864.	1661.	0.831	11.30	0.976
RA-224	482.57	241.71	916.	153.	0.077	87.23	1.500
PB-214	589.91	295.38	316.	257.	0.128	35.96	1.061
AC-228	676.10	338.48	304.	348.	0.174	29.32	1.131
PB-214	703.48	352.17	299.	422.	0.211	24.80	1.152
SB-125	925.86	463.37	130.	116.	0.058	49.71	1.500s
TL-208	1021.43	511.16	245.	210.	0.105	39.25	1.191s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
TL-208	1166.00	583.45	156.	589.	0.294	16.39	1.342
BI-214	1218.14	609.52	138.	344.	0.172	23.82	1.454s
BI-212	1454.45	727.69	137.	147.	0.074	49.12	1.232
CS-134	1589.53	795.24	76.	59.	0.030	73.65	1.500s
AC-228	1822.39	911.68	71.	343.	0.171	19.95	1.488
EU-152	1929.39	965.19	72.	69.	0.035	62.69	1.538s
AC-228	1936.81	968.90	43.	222.	0.111	23.70	1.541D
BI-214	2240.34	1120.68	78.	81.	0.041	63.74	1.200s
EU-152	2816.73	1408.92	24.	20.	0.010	121.09	1.812
K-40	2921.87	1461.50	43.	1328.	0.664	8.46	1.857
BI-212	3243.17	1622.18	2.	33.	0.016	57.73	1.146s
BI-214	3529.23	1765.24	5.	59.	0.029	39.90	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		6.0251E-03					
			477.56	6.025E-03	&(	4.210E-01 1.23E-01	G
K-40		1.8093E+01					
			1460.75	1.809E+01	(P	4.518E-01 5.18E-01	G
MN-54		-5.7957E-04					
			834.81	-5.796E-04	%(P	4.348E-02 1.24E-02	G
CO-57		1.4490E-02					
			122.07	1.449E-02	%(P	6.549E-02 1.97E-02	G K
			136.43	-5.827E-02	%	5.015E-01 1.50E-01	G
CO-60		1.7214E-03					
			1332.51	1.721E-03	&(P	3.810E-02 1.03E-02	G K
			1173.23	4.823E-03	% P	5.933E-02 1.71E-02	G K
Sr-85		-2.0648E-02					
			514.00	-2.065E-02	%(	5.752E-02 1.73E-02	G
Kr-85		-4.6141E+02					
			513.99	-4.614E+02	%(	1.285E+03 3.87E+02	G
Y-88		2.0292E-03					
			1836.01	2.029E-03	%(P	3.159E-02 8.33E-03	G K
			898.02	-2.848E-03	% P	3.883E-02 1.09E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
NB-94	1.0593E-03						
		871.10	1.059E-03	%(	4.216E-02	1.20E-02	G K
		702.50	1.286E-02	%	4.580E-02	1.36E-02	G K
Ag-108M	-8.8460E-03						
		722.95	-8.846E-03	&(	5.669E-02	1.67E-02	G K
		614.37	1.360E-02	% P	4.646E-02	1.38E-02	G
		433.93	-2.222E-03	&	4.297E-02	1.26E-02	G
CD-109	2.1238E+00						
		88.04	2.124E+00	(	2.393E+00	7.36E-01	G
SN-113	1.4573E-02						
		391.71	1.457E-02	%(	6.361E-02	1.89E-02	G K
		255.04	1.616E-01	%	2.048E+00	6.08E-01	G
SB-125	1.6782E-01						
		427.95	-1.292E-02	&(P	1.321E-01	3.88E-02	G K
		600.77	8.247E-03	% P	1.882E-01	5.41E-02	G
		636.15	-6.226E-02	% P	3.998E-01	1.17E-01	G
		463.51	7.028E-01	(P	3.399E-01	1.18E-01	G
		176.29	-2.808E-02	%	7.130E-01	2.12E-01	G
I-131	-3.1657E-03						
		364.48	-3.166E-03	%(P	6.402E-02	1.88E-02	G K
		636.97	-1.695E-01	%	7.870E-01	2.32E-01	G
		284.29	2.310E-01	% P	8.373E-01	2.51E-01	G
CS-134	3.2801E-02						
		604.66	5.055E-03	%(	2.618E-02	7.57E-03	G K
		795.76	6.451E-02	*(P	4.732E-02	1.59E-02	G
		569.29	6.556E-02	% P	2.751E-01	8.13E-02	G
		801.84	-1.444E-01	% P	4.661E-01	1.36E-01	G
CS-137	2.6648E-02						
		661.62	2.665E-02	%(P	5.354E-02	1.62E-02	G
CE-139	-1.0562E-02						
		165.85	-1.056E-02	&(	5.442E-02	1.63E-02	G
EU-152	1.7854E-01						
		121.78	4.361E-02	%(P	1.905E-01	5.72E-02	G K
		344.30	-1.812E-02	% P	1.486E-01	4.40E-02	G
		1408.08	1.363E-01	(	1.697E-01	5.50E-02	G
		964.00	5.105E-01	(P	3.115E-01	1.08E-01	G
		1112.07	6.616E-02	%	3.522E-01	1.03E-01	G
		778.90	-7.169E-02	%	3.806E-01	1.12E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
EU-154	2.5670E-02						
		123.10	2.567E-02	%(	1.348E-01	4.05E-02	G K
		1274.80	-9.231E-04	%	1.130E-01	3.13E-02	G
		723.30	-5.230E-02	&	2.526E-01	7.46E-02	G
		1004.80	-9.992E-02	&	2.613E-01	7.82E-02	G
EU-155	2.6318E-01						
		86.45	2.632E-01	&(	2.995E-01	9.21E-02	G K
		105.31	8.042E-02	&	3.052E-01	9.19E-02	G
HG-203	1.1027E-03						
		279.17	1.103E-03	&(P	5.413E-02	1.60E-02	G K
		72.87	-4.612E-01	% P	2.842E+00	8.53E-01	G
		70.83	-2.998E+00	%	5.907E+00	1.79E+00	G
		82.50	-1.815E+00	%	5.275E+00	1.59E+00	G
TL-208	4.9966E-01						
		583.14	4.997E-01	(P	5.175E-02	2.75E-02	G
		510.72	6.121E-01	+ P	2.208E-01	9.03E-02	G
PB-212	1.4484E+00						
		238.63	1.437E+00	(P	1.208E-01	5.45E-02	G K
							Energy duplication
		77.11	1.335E+00	} P	4.931E-01	1.29E-01	G
		74.81	2.036E+00	+ P	1.002E+00	3.28E-01	G
PB-214	5.5988E-01						
		351.99	5.539E-01	(P	1.093E-01	4.64E-02	G K
		295.22	5.714E-01	(P	1.903E-01	6.96E-02	G
							Energy duplication
		77.11	0.000E+00	} P	1.221E+00	0.00E+00	G
		241.92	1.255E-01	%	7.963E-01	2.39E-01	G
BI-212	1.0817E+00						
		727.17	1.082E+00	(P	4.208E-01	1.78E-01	G K
		1620.56	1.877E+00	+ P	5.553E-01	3.62E-01	G
		785.42	1.597E+00	&	2.131E+00	6.67E-01	G
BI-214	5.9134E-01						
		609.32	5.633E-01	*(P	9.437E-02	4.56E-02	G K
		1764.51	6.203E-01	(P	1.416E-01	8.71E-02	G
		1120.28	6.465E-01	@(P	3.494E-01	1.41E-01	G
RA-224	1.4724E+00						
		241.00	1.472E+00	(	1.381E+00	4.28E-01	G
RA-226	1.6180E+00						
		185.99	1.618E+00	@(P	1.317E+00	4.54E-01	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments

AC-228       1.2934E+00
                          911.07 1.216E+00  (P 1.493E-01 8.17E-02 G K
                          968.90 1.369E+00  (P 2.054E-01 1.08E-01 G
                          338.40 1.370E+00  (P 3.301E-01 1.34E-01 G

TH-227      -9.9641E-02
                          236.00-9.964E-02 &(  4.513E-01 1.35E-01 G K
                          256.25 1.155E-01 & P 5.742E-01 1.71E-01 G

PA-234      -5.7287E-02
                           98.44-5.729E-02 %(P 2.976E-01 8.93E-02 G K
                          946.00-2.142E-02 % P 2.146E-01 6.17E-02 G
                          131.28 6.346E-03 % P 2.367E-01 7.04E-02 G
                           94.67-1.188E-01 & P 5.314E-01 1.60E-01 G
                          883.24 1.117E-01 %   3.349E-01 9.96E-02 G
                          926.70-2.095E-02 %   3.800E-01 1.08E-01 G
                          569.26 9.699E-02 % P 4.070E-01 1.20E-01 G

TH-234       2.2344E+00
                           63.29 1.877E+00 %(P 8.115E+00 2.43E+00 G K
                           92.80 2.272E+00  (P 2.806E+00 8.57E-01 G
                           92.38 2.732E+00  (P 3.320E+00 1.01E+00 G

AM-241      -1.0083E-01
                           59.54-1.008E-01 &(P 1.404E+00 4.19E-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
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	5.7901E-03	6.0251E-03	3.6824E-01	3.6824E-01	4.046E-01
K-40		1.8093E+01	1.8093E+01	1.5523E+00	1.8743E+00	
MN-54	#A	-5.7564E-04	-5.7957E-04	1.4816E-01	1.4816E-01	4.319E-02
CO-57	#B	1.4377E-02	1.4490E-02	5.9029E-02	5.9034E-02	6.498E-02
CO-60	#B	1.7195E-03	1.7214E-03	3.0951E-02	3.0951E-02	3.806E-02
Sr-85	#A	-1.9982E-02	-2.0648E-02	5.1919E-02	5.1933E-02	5.567E-02
Kr-85	#A	-4.6140E+02	-4.6141E+02	1.1599E+03	1.1603E+03	1.285E+03
Y-88	#B	1.9891E-03	2.0292E-03	2.4990E-02	2.4990E-02	3.097E-02
NB-94	#B	1.0593E-03	1.0593E-03	3.6064E-02	3.6064E-02	4.216E-02
Ag-108M	#B	-8.8456E-03	-8.8460E-03	5.0020E-02	5.0023E-02	5.668E-02
CD-109	#A	2.1139E+00	2.1238E+00	2.2083E+00	2.2115E+00	2.381E+00
SN-113	#B	1.4306E-02	1.4573E-02	5.6813E-02	5.6820E-02	6.244E-02
SB-125	#F	1.6747E-01	1.6782E-01	8.4345E-02	8.4906E-02	1.319E-01
I-131	#B	-2.4305E-03	-3.1657E-03	8.0072E-02	8.0072E-02	4.915E-02
CS-134	#F	3.2709E-02	3.2801E-02	2.4194E-02	2.4268E-02	2.611E-02
CS-137	#A	2.6643E-02	2.6648E-02	4.8676E-02	4.8701E-02	5.353E-02
CE-139	#A	-1.0400E-02	-1.0562E-02	4.8917E-02	4.8921E-02	5.358E-02
EU-152	#B	1.7846E-01	1.7854E-01	1.1280E-01	1.1324E-01	1.904E-01
EU-154	#B	2.5652E-02	2.5670E-02	1.2138E-01	1.2139E-01	1.347E-01
EU-155	#A	2.6287E-01	2.6318E-01	2.7620E-01	2.7658E-01	2.991E-01
HG-203	#B	1.0535E-03	1.1027E-03	4.8036E-02	4.8036E-02	5.172E-02
TL-208		4.9966E-01	4.9966E-01	8.2470E-02	8.7423E-02	
PB-212		1.4484E+00	1.4484E+00	1.6486E-01	1.8507E-01	
PB-214		5.5988E-01	5.5988E-01	1.2411E-01	1.2829E-01	
BI-212		1.0817E+00	1.0817E+00	5.3311E-01	5.3680E-01	
BI-214		5.9134E-01	5.9134E-01	1.4352E-01	1.4757E-01	
RA-224		1.4724E+00	1.4724E+00	1.2845E+00	1.2873E+00	1.381E+00
RA-226	#	1.6180E+00	1.6180E+00	1.3611E+00	1.3644E+00	
AC-228		1.2934E+00	1.2934E+00	1.8463E-01	1.9932E-01	
TH-227	#B	-9.9641E-02	-9.9641E-02	4.0637E-01	4.0641E-01	4.513E-01
PA-234	#B	-5.7287E-02	-5.7287E-02	2.8599E-01	2.8601E-01	2.976E-01
TH-234	#B	2.2344E+00	2.2344E+00	2.4901E+00	2.4932E+00	8.115E+00
AM-241	#A	-1.0083E-01	-1.0083E-01	1.3097E+00	1.3097E+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) 2.6657856E+01 pCi/gm
Total Decayed Activity (1120.0 to 2000.7 keV) 2.6657864E+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_29JUNE2006_0846.An1

Sample description
FSS-OOL-10-03-021-F-B WET

Spectrum Filename: C:\GammaVision\Spectra\103F_29JUNE2006_0846.An1

Acquisition information
Start time: 29-Jun-2006 08:48:24
Live time: 2000
Real time: 2002
Dead time: 0.12 %
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: 2.3420E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 2.3420E+03) =
4.2699E+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	26-Jun-2006 15:33:00
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. 17 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.0755

***** 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	152.	20.21	0.99	9.110E-03	74.81	9.600	9.866E-01	PB212
77.31	216.	14.48	0.99	1.028E-02	77.11	17.500	6.945E-01	PB212
93.00	111.	37.76	1.50	1.645E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
93.02	109.	38.67	1.50	1.631E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
128.74	113.	31.05	1.15	2.433E-02				
185.97	185.	24.61	1.21	2.567E-02				
185.97	185.	24.61	1.21	2.567E-02	185.99	3.280	1.182E+00	RA226
209.47	126.	30.58	1.02	2.470E-02				
238.68	1251.	3.30	1.09	2.320E-02	238.63	43.100	7.149E-01	PB212
241.97	170.	16.38	1.10	2.302E-02	241.00	3.900	1.091E+00	RA224
295.20	319.	9.37	1.16	2.025E-02	295.22	19.200	4.668E-01	PB214
327.92	66.	35.86	1.03	1.874E-02				
338.85	284.	11.99	1.14	1.828E-02	338.40	12.010	7.416E-01	AC228
351.97	494.	7.24	1.19	1.775E-02	351.99	37.100	4.280E-01	PB214
409.73	68.	31.89	1.82	1.574E-02				
462.99	94.	24.27	1.17	1.426E-02				
462.99	94.	24.27	1.17	1.426E-02	463.51	10.000	3.746E-01	SB125
510.78	188.	13.29	1.85	1.317E-02	510.72	22.500	3.149E-01	TL208
583.27	377.	7.02	1.49	1.184E-02	583.14	86.000	2.112E-01	TL208
609.37	372.	8.33	1.30	1.144E-02	609.32	46.090	3.995E-01	BI214
727.01	93.	17.18	2.17	9.966E-03	727.17	11.800	4.530E-01	BI212
769.22	72.	23.94	1.45	9.545E-03				
794.72	66.	31.63	1.45	9.311E-03				
794.72	66.	31.63	1.45	9.311E-03	795.76	85.400	4.771E-02	CS134
860.26	94.	22.67	1.38	8.770E-03				

911.25	294.	7.14	1.73	8.400E-03	911.07	29.000	6.871E-01	AC228
964.65	41.	34.40	1.54	8.056E-03	964.00	14.580	PBC<MDA	EU152
968.83	196.	10.97	1.75	8.026E-03	968.90	17.460	8.081E-01	AC228
1121.16	130.	15.43	1.29	7.208E-03	1120.28	15.040	6.826E-01	BI214
1460.87	1319.	2.84	1.60	5.932E-03	1460.75	10.700	1.182E+01	K40
1620.06	28.	32.09	1.05	5.488E-03	1620.56	2.750	1.054E+00	BI212
1764.51	80.	11.99	1.44	5.142E-03	1764.51	15.920	5.409E-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	
418.11	209.47	564.	126.	0.063	91.74	1.024	AC-228	s
654.99	327.92	223.	66.	0.033	107.59	1.029	AC-228	s
818.59	409.73	164.	68.	0.034	95.68	1.821	AC-228	s
1537.51	769.22	78.	72.	0.036	71.83	1.454	BI-214	sM
1588.49	794.72	106.	61.	0.031	80.76	1.453	AC-228	
1719.56	860.26	93.	94.	0.047	68.02	1.380	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	399.	154.	0.077	58.84	0.993D
PB-212	153.39	77.11	387.	202.	0.101	36.00	0.995A
RA-226	372.02	186.43	855.	148.	0.074	80.19	1.500s
PB-212	476.56	238.70	843.	1174.	0.587	14.82	1.106
RA-224	482.44	241.64	869.	140.	0.070	92.96	1.500
PB-214	589.55	295.20	264.	315.	0.157	28.11	1.159
AC-228	676.84	338.85	312.	283.	0.141	35.96	1.145s
PB-214	703.09	351.97	286.	489.	0.244	21.72	1.187
SB-125	925.03	462.96	157.	70.	0.035	82.20	1.500
TL-208	1020.68	510.78	183.	162.	0.081	39.87	1.853s
TL-208	1165.64	583.27	129.	373.	0.186	21.07	1.486
BI-214	1217.84	609.37	174.	365.	0.183	24.99	1.299
BI-212	1453.08	727.01	71.	92.	0.046	51.55	2.171s
AC-228	1821.52	911.25	62.	290.	0.145	21.43	1.735s
EU-152	1928.32	964.65	83.	41.	0.021	103.21	1.538
AC-228	1936.68	968.83	84.	196.	0.098	32.90	1.754
BI-214	2241.29	1121.16	85.	128.	0.064	46.28	1.289s
K-40	2920.62	1460.87	40.	1300.	0.650	8.52	1.597
BI-212	3238.93	1620.06	12.	28.	0.014	96.27	1.053s
BI-214	3527.78	1764.51	6.	77.	0.038	35.97	1.441s

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		1.5563E-01					
			477.56	1.556E-01	%(	2.241E-01 6.94E-02	G
K-40		1.1820E+01					
			1460.75	1.182E+01	(P	2.916E-01 3.41E-01	G
MN-54		8.7196E-03					
			834.81	8.720E-03	%(P	3.036E-02 8.99E-03	G
CO-57		-2.9278E-03					
			122.07	-2.928E-03	%(P	4.335E-02 1.29E-02	G K
			136.43	2.485E-02	&	3.517E-01 1.05E-01	G
CO-60		7.5146E-03					
			1332.51	7.515E-03	%(P	2.696E-02 7.74E-03	G K
			1173.23	1.569E-02	% P	3.499E-02 1.05E-02	G K
Sr-85		-1.3041E-02					
			514.00	-1.304E-02	%(	3.760E-02 1.13E-02	G
Kr-85		-2.9325E+02					
			513.99	-2.933E+02	%(	8.433E+02 2.53E+02	G
Y-88		-2.1723E-03					
			1836.01	-2.172E-03	%(P	2.284E-02 6.15E-03	G K
			898.02	-3.248E-03	& P	3.605E-02 1.04E-02	G
NB-94		6.1470E-03					
			871.10	6.147E-03	&(	2.627E-02 7.70E-03	G K
			702.50	1.047E-02	&	2.519E-02 7.58E-03	G K
Ag-108M		-1.8619E-02					
			722.95	-1.862E-02	%(	4.029E-02 1.22E-02	G K
			614.37	-6.180E-03	% P	3.206E-02 9.45E-03	G
			433.93	2.694E-03	%	2.869E-02 8.43E-03	G
CD-109		1.0062E+00					
			88.04	1.006E+00	%(	1.575E+00 4.80E-01	G
SN-113		1.1171E-02					
			391.71	1.117E-02	%(	4.307E-02 1.29E-02	G K
			255.04	0.000E+00	%	1.440E+00 4.27E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	7.0867E-02						
		427.95	-1.392E-03	&(P	8.458E-02	2.46E-02	G K
		600.77	2.855E-03	% P	1.469E-01	4.24E-02	G
		636.15	-7.523E-02	& P	2.391E-01	7.10E-02	G
		463.51	2.848E-01	(P	2.481E-01	7.94E-02	G
		176.29	5.471E-02	%	4.899E-01	1.46E-01	G
I-131	8.9479E-03						
		364.48	8.948E-03	%(P	3.425E-02	1.02E-02	G K
		636.97	1.753E-01	%	4.337E-01	1.30E-01	G
		284.29	1.139E-01	% P	5.338E-01	1.59E-01	G
CS-134	-1.6445E-03						
		604.66	-1.645E-03	%(	6.013E-02	1.78E-02	G K
		795.76	3.037E-03	% P	3.593E-02	1.04E-02	G
		569.29	3.814E-02	% P	1.756E-01	5.17E-02	G
		801.84	-1.172E-02	% P	3.913E-01	1.12E-01	G
CS-137	5.0860E-03						
		661.62	5.086E-03	%(P	3.555E-02	1.04E-02	G
CE-139	4.5382E-03						
		165.85	4.538E-03	%(	3.140E-02	9.37E-03	G
EU-152	7.5384E-02						
		121.78	1.214E-02	%(P	1.116E-01	3.33E-02	G K
		344.30	-3.383E-02	% P	1.037E-01	3.11E-02	G
		1408.08	0.000E+00	%	1.270E-01	3.49E-02	G
		964.00	2.022E-01	&(P	2.214E-01	7.05E-02	G
		1112.07	3.104E-03	%	2.587E-01	7.38E-02	G
		778.90	2.249E-02	%	2.066E-01	5.97E-02	G
EU-154	-1.4048E-03						
		123.10	-1.405E-03	%(	9.520E-02	2.84E-02	G K
		1274.80	-2.122E-04	&	9.148E-02	2.57E-02	G
		723.30	-9.215E-02	%	1.960E-01	5.94E-02	G
		1004.80	-2.801E-02	%	1.734E-01	5.04E-02	G
EU-155	1.2399E-01						
		86.45	1.240E-01	%(	1.968E-01	6.00E-02	G K
		105.31	7.238E-02	%	1.904E-01	5.75E-02	G
HG-203	-4.3844E-03						
		279.17	-4.384E-03	&(P	3.612E-02	1.07E-02	G K
		72.87	-5.587E-01	% P	1.758E+00	5.30E-01	G
		70.83	-9.831E-01	%	3.736E+00	1.12E+00	G
		82.50	-4.979E-01	&	3.361E+00	1.01E+00	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments

TL-208       2.1122E-01
                          583.14 2.112E-01  (P 3.153E-02 1.50E-02 G
                          510.72 3.149E-01 + P 1.281E-01 4.87E-02 G

PB-212       6.8498E-01
                          238.63 6.773E-01  (P 7.966E-02 3.38E-02 G K
                                                          Energy duplication
                           77.11 6.597E-01 } P 3.076E-01 7.92E-02 G
                           74.81 1.023E+00 + P 6.364E-01 2.05E-01 G

PB-214       4.4126E-01
                          351.99 4.280E-01  (P 7.147E-02 3.13E-02 G K
                          295.22 4.668E-01  (P 1.165E-01 4.43E-02 G
                                                          Energy duplication
                           77.11 0.000E+00 } P 7.653E-01 0.00E+00 G
                          241.92-2.755E-01 %   4.799E-01 1.46E-01 G

BI-212       4.5296E-01
                          727.17 4.530E-01 *(P 2.056E-01 7.82E-02 G K
                         1620.56 1.054E+00 + P 7.322E-01 3.39E-01 G
                          785.42 7.298E-01 %   1.335E+00 4.08E-01 G

BI-214       3.9949E-01
                          609.32 3.995E-01  (P 7.023E-02 3.39E-02 G K
                         1764.51 5.409E-01 + P 1.014E-01 6.76E-02 G
                         1120.28 6.826E-01 + P 2.426E-01 1.07E-01 G

RA-224       8.9684E-01
                          241.00 8.968E-01  (  8.984E-01 2.78E-01 G

RA-226       1.0125E+00
                          185.99 1.013E+00 *(P 9.526E-01 2.94E-01 G

AC-228       7.3445E-01
                          911.07 6.871E-01 @(P 9.322E-02 4.97E-02 G K
                          968.90 8.081E-01  (P 1.868E-01 8.87E-02 G
                          338.40 7.416E-01 @(P 2.234E-01 8.93E-02 G

TH-227      -9.9029E-02
                          236.00-9.903E-02 %(  3.392E-01 1.02E-01 G K
                          256.25-5.756E-02 & P 3.925E-01 1.17E-01 G

PA-234      -5.5557E-03
                           98.44-5.556E-03 &(P 1.887E-01 5.63E-02 G K
                          946.00-2.711E-02 % P 1.600E-01 4.67E-02 G
                          131.28-7.642E-02 % P 1.880E-01 5.69E-02 G
                           94.67-1.439E-01 % P 3.539E-01 1.07E-01 G
                          883.24 2.650E-02 &   2.137E-01 6.15E-02 G
                          926.70-2.659E-03 &   2.163E-01 6.06E-02 G
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 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26 5.635E-02 % P 2.599E-01 7.66E-02 G

TH-234       5.8350E-01
                           63.29 5.835E-01 &(P 5.605E+00 1.67E+00 G K
                           92.80 1.293E+00 & P 1.860E+00 5.66E-01 G
                           92.38 1.498E+00 & P 2.213E+00 6.73E-01 G

AM-241      -3.4201E-04
                           59.54-3.420E-04 &(P 9.271E-01 2.76E-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:                      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	1.5023E-01	1.5563E-01	2.0824E-01	2.0844E-01	2.163E-01
K-40		1.1820E+01	1.1820E+01	1.0215E+00	1.2306E+00	
MN-54	#A	8.6672E-03	8.7196E-03	2.6978E-02	2.6983E-02	3.018E-02
CO-57	#B	-2.9074E-03	-2.9278E-03	4.2296E-02	4.2296E-02	4.305E-02
CO-60	#B	7.5073E-03	7.5146E-03	2.3218E-02	2.3222E-02	2.693E-02

Sr-85	#A	-1.2668E-02	-1.3041E-02	3.3905E-02	3.3914E-02	3.652E-02
Kr-85	#A	-2.9325E+02	-2.9325E+02	7.6045E+02	7.6064E+02	8.432E+02
Y-88	#B	-2.1342E-03	-2.1723E-03	1.9752E-02	1.9753E-02	2.244E-02
NB-94	#B	6.1470E-03	6.1470E-03	2.3092E-02	2.3095E-02	2.627E-02
Ag-108M	#B	-1.8618E-02	-1.8619E-02	3.6601E-02	3.6617E-02	4.029E-02
CD-109	#A	1.0020E+00	1.0062E+00	1.4415E+00	1.4426E+00	1.569E+00
SN-113	#B	1.0989E-02	1.1171E-02	3.8564E-02	3.8569E-02	4.237E-02
SB-125	#B	7.0735E-02	7.0867E-02	5.9311E-02	5.9453E-02	8.442E-02
I-131	#B	7.0781E-03	8.9479E-03	3.0564E-02	3.0568E-02	2.709E-02
CS-134	#B	-1.6404E-03	-1.6445E-03	5.3545E-02	5.3545E-02	5.998E-02
CS-137	#A	5.0851E-03	5.0860E-03	3.1184E-02	3.1185E-02	3.554E-02
CE-139	#A	4.4764E-03	4.5382E-03	2.8101E-02	2.8102E-02	3.097E-02
EU-152	#B	7.5353E-02	7.5384E-02	7.8832E-02	7.8943E-02	1.115E-01
EU-154	#B	-1.4039E-03	-1.4048E-03	8.5231E-02	8.5231E-02	9.515E-02
EU-155	#B	1.2386E-01	1.2399E-01	1.8003E-01	1.8016E-01	1.966E-01
HG-203	#B	-4.2106E-03	-4.3844E-03	3.2429E-02	3.2430E-02	3.468E-02
TL-208		2.1122E-01	2.1122E-01	4.5014E-02	4.6655E-02	
PB-212		6.8498E-01	6.8498E-01	1.0254E-01	1.0998E-01	
PB-214		4.4126E-01	4.4126E-01	7.9357E-02	8.3389E-02	
BI-212		4.5296E-01	4.5296E-01	2.3474E-01	2.3621E-01	
BI-214		3.9949E-01	3.9949E-01	1.0161E-01	1.0422E-01	
RA-224	#A	8.9684E-01	8.9684E-01	8.3371E-01	8.3534E-01	8.984E-01
RA-226	#	1.0125E+00	1.0125E+00	8.8320E-01	8.8516E-01	9.526E-01
AC-228		7.3445E-01	7.3445E-01	1.3086E-01	1.3763E-01	
TH-227	#B	-9.9029E-02	-9.9029E-02	3.0660E-01	3.0665E-01	3.392E-01
PA-234	#B	-5.5557E-03	-5.5557E-03	2.6634E-01	2.6634E-01	1.887E-01
TH-234	#B	5.8350E-01	5.8350E-01	5.0187E+00	5.0188E+00	5.605E+00
AM-241	#A	-3.4200E-04	-3.4201E-04	1.3587E+00	1.3587E+00	9.271E-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 (87.4 to 2000.7 keV) 1.4744766E+01 pCi/gm
Total Decayed Activity (87.4 to 2000.7 keV) 1.4744766E+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_29JUNE2006_1413.An1

Sample description
FSS-OOL-10-03-013-F

Spectrum Filename: C:\GammaVision\Spectra\103F_29JUNE2006_1413.An1

Acquisition information
Start time: 29-Jun-2006 14:15:34
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: 2.0220E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 2.0220E+03) =
4.9456E+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	26-Jun-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: 0.1880

***** 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	61.	37.37	0.99	9.052E-03	74.81	9.600	PBC<MDA	PB212
76.52	227.	16.13	1.07	9.845E-03	77.11	17.500	8.465E-01	PB212
87.89	91.	38.02	1.17	1.466E-02				
87.89	91.	38.02	1.17	1.466E-02	88.04	3.790	1.095E+00	CD109
93.15	74.	41.19	0.96	1.657E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
185.96	143.	24.38	1.34	2.567E-02				
185.96	143.	24.38	1.34	2.567E-02	185.99	3.280	1.032E+00	RA226
209.68	73.	32.58	0.95	2.469E-02				
238.77	630.	4.86	1.09	2.319E-02	238.63	43.100	4.128E-01	PB212
241.64	98.	20.52	1.09	2.304E-02	241.00	3.900	7.276E-01	RA224
					241.92	7.470	3.807E-01	PB214
270.23	62.	32.74	0.89	2.151E-02				
295.31	192.	15.43	1.11	2.024E-02	295.22	19.200	3.224E-01	PB214
338.59	136.	17.94	1.11	1.829E-02	338.40	12.010	4.102E-01	AC228
352.06	318.	10.62	1.10	1.775E-02	351.99	37.100	3.170E-01	PB214
462.73	49.	38.89	0.66	1.427E-02				
462.73	49.	38.89	0.66	1.427E-02	463.51	10.000	PBC<MDA	SB125
510.43	138.	17.57	1.97	1.318E-02	510.72	22.500	2.499E-01	TL208
583.26	264.	8.09	1.61	1.184E-02	583.14	86.000	1.701E-01	TL208
609.58	210.	11.43	1.13	1.144E-02	609.32	46.090	2.575E-01	BI214
727.39	79.	24.56	1.38	9.962E-03	727.17	11.800	4.462E-01	BI212
795.01	37.	25.61	1.48	9.308E-03				
795.01	37.	25.61	1.48	9.308E-03	795.76	85.400	3.114E-02	CS134
911.38	162.	9.71	1.54	8.399E-03	911.07	29.000	4.365E-01	AC228
964.87	38.	24.91	1.54	8.050E-03				
969.34	98.	12.74	1.54	8.022E-03	968.90	17.460	4.669E-01	AC228

1119.86	57.	24.56	1.76	7.214E-03	1120.28	15.040	3.371E-01	BI214
1160.08	22.	39.22	0.80	7.029E-03				
1461.29	1000.	3.29	1.87	5.930E-03	1460.75	10.700	1.033E+01	K40
1765.02	52.	14.36	1.28	5.142E-03	1764.51	15.920	4.272E-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	
174.96	87.89	481.	91.	0.045	114.07	1.173	PB-214	l
185.47	93.15	402.	74.	0.037	123.58	0.958	U-235	l
418.52	209.68	233.	73.	0.036	97.74	0.949	NP-239	
539.62	270.23	166.	62.	0.031	98.22	0.893	AC-228	s
924.59	462.73	106.	49.	0.024	116.66	0.659	CS-138	l
1929.72	964.99	29.	35.	0.018	81.80	1.539	AC-228	D
2319.11	1160.08	28.	22.	0.011	117.65	0.798	-	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	254.	61.	0.030	112.12	0.993D
PB-212	153.39	77.11	278.	109.	0.054	57.54	0.995A
RA-226	371.70	186.27	521.	122.	0.061	75.67	1.500s
PB-212	476.67	238.76	447.	596.	0.298	20.32	1.128
RA-224	483.22	242.03	462.	77.	0.038	123.84	1.500
PB-214	589.77	295.31	266.	188.	0.094	46.29	1.115
AC-228	676.33	338.59	171.	135.	0.067	53.81	1.112
PB-214	703.27	352.06	241.	312.	0.156	31.86	1.099s
TL-208	1019.97	510.43	154.	111.	0.055	52.71	1.969s
TL-208	1165.61	583.26	73.	259.	0.130	24.28	1.610s
BI-214	1218.26	609.58	117.	203.	0.102	34.29	1.127
BI-212	1454.43	727.68	80.	47.	0.023	91.04	1.500
CS-134	1589.31	795.13	30.	35.	0.017	84.04	1.500
AC-228	1821.80	911.38	38.	159.	0.080	29.12	1.543
AC-228	1936.81	968.90	30.	98.	0.049	38.54	1.541D
BI-214	2238.70	1119.86	43.	55.	0.027	73.68	1.755s
K-40	2921.44	1461.29	40.	981.	0.491	9.88	1.872
BI-214	3528.80	1765.02	6.	52.	0.026	43.08	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	Peak MDA Value pCi/gm	COMMENTS
BE-7		-6.0903E-03					
			477.56	-6.090E-03	%(	2.567E-01 7.41E-02	G
K-40		1.0332E+01					
			1460.75	1.033E+01	(P	3.378E-01 3.47E-01	G
MN-54		-1.9356E-04					
			834.81	-1.936E-04	%(P	2.823E-02 7.93E-03	G
CO-57		-1.1792E-02					
			122.07	-1.179E-02	%(P	4.031E-02 1.21E-02	G K
			136.43	-5.027E-04	%	3.041E-01 9.02E-02	G
CO-60		-3.8819E-03					
			1332.51	-3.882E-03	%(P	2.830E-02 7.41E-03	G K
			1173.23	1.090E-02	% P	3.916E-02 1.15E-02	G K
Sr-85		-1.1828E-02					
			514.00	-1.183E-02	%(	3.283E-02 9.85E-03	G
Kr-85		-2.6456E+02					
			513.99	-2.646E+02	%(	7.342E+02 2.20E+02	G
Y-88		-2.2167E-03					
			1836.01	-2.217E-03	%(P	2.376E-02 6.30E-03	G K
			898.02	-3.351E-03	% P	2.675E-02 7.52E-03	G
NB-94		1.9674E-04					
			871.10	1.967E-04	&(	2.263E-02 6.25E-03	G K
			702.50	-1.738E-03	%	2.735E-02 7.84E-03	G K
Ag-108M		4.1385E-03					
			722.95	4.138E-03	%(	3.243E-02 9.40E-03	G K
			614.37	-2.085E-02	% P	3.739E-02 1.14E-02	G
			433.93	-4.683E-03	%	2.794E-02 8.21E-03	G
CD-109		8.1647E-01					
			88.04	8.165E-01	%(	1.451E+00 4.42E-01	G
SN-113		-3.4516E-03					
			391.71	-3.452E-03	&(	3.863E-02 1.13E-02	G K
			255.04	4.081E-01	&	1.018E+00 3.07E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	9.2959E-03						
		427.95	9.296E-03	&(P	7.329E-02	2.13E-02	G K
		600.77	-3.394E-03	% P	1.559E-01	4.48E-02	G
		636.15	-1.544E-03	% P	2.160E-01	6.09E-02	G
		463.51	7.696E-02	% P	2.384E-01	7.09E-02	G
		176.29	1.425E-03	%	3.678E-01	1.08E-01	G
I-131	8.4896E-03						
		364.48	8.490E-03	%(P	3.697E-02	1.09E-02	G K
		636.97	-8.057E-02	%	4.455E-01	1.30E-01	G
		284.29	8.731E-02	% P	4.871E-01	1.44E-01	G
CS-134	1.4429E-02						
		604.66	1.464E-03	&(	3.002E-02	8.67E-03	G K
		795.76	2.925E-02	(P	2.385E-02	8.21E-03	G
		569.29	-9.562E-03	& P	1.606E-01	4.54E-02	G
		801.84	1.316E-01	% P	2.980E-01	8.93E-02	G
CS-137	1.2436E-02						
		661.62	1.244E-02	%(P	2.957E-02	8.86E-03	G
CE-139	-1.1826E-02						
		165.85	-1.183E-02	%(	3.414E-02	1.03E-02	G
EU-152	-3.4616E-02						
		121.78	-3.462E-02	%(P	1.174E-01	3.53E-02	G K
		344.30	-3.603E-02	% P	9.112E-02	2.74E-02	G
		1408.08	2.528E-02	%	1.015E-01	2.89E-02	G
		964.00	5.679E-02	& P	2.037E-01	5.98E-02	G
		1112.07	-7.936E-02	%	3.034E-01	8.96E-02	G
		778.90	2.418E-02	%	1.933E-01	5.54E-02	G
EU-154	-2.4125E-02						
		123.10	-2.412E-02	%(	8.655E-02	2.60E-02	G K
		1274.80	-2.003E-02	%	1.091E-01	3.17E-02	G
		723.30	1.324E-03	%	1.633E-01	4.68E-02	G
		1004.80	5.492E-02	%	1.594E-01	4.73E-02	G
EU-155	4.6269E-03						
		86.45	4.627E-03	%(	1.841E-01	5.47E-02	G K
		105.31	1.764E-02	&	1.769E-01	5.27E-02	G
HG-203	-2.7701E-03						
		279.17	-2.770E-03	&(P	3.295E-02	9.72E-03	G K
		72.87	-9.100E-01	& P	1.860E+00	5.64E-01	G
		70.83	1.178E-01	%	3.285E+00	9.76E-01	G
		82.50	-1.876E-01	&	2.957E+00	8.80E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	1.7012E-01						
		583.14	1.701E-01	@(P	2.785E-02	1.40E-02	G
		510.72	2.499E-01	+ P	1.366E-01	5.45E-02	G
PB-212	4.1070E-01						
		238.63	3.984E-01	(P	6.766E-02	2.75E-02	G K
							Energy duplication
		77.11	4.107E-01	} P	3.036E-01	7.88E-02	G
		74.81	4.659E-01	(P	5.925E-01	1.83E-01	G
PB-214	3.1881E-01						
		351.99	3.170E-01	@(P	7.610E-02	3.43E-02	G K
		295.22	3.224E-01	(P	1.354E-01	5.08E-02	G
							Energy duplication
		77.11	0.000E+00	} P	6.759E-01	0.00E+00	G
		241.92	5.922E-02	%	4.372E-01	1.30E-01	G
BI-212	2.6661E-01						
		727.17	2.666E-01	(P	2.527E-01	8.18E-02	G K
		1620.56	1.271E-01	% P	7.759E-01	2.13E-01	G
		785.42	2.364E-01	&	1.324E+00	3.84E-01	G
BI-214	2.7707E-01						
		609.32	2.575E-01	(P	6.729E-02	3.04E-02	G K
		1764.51	4.272E-01	+ P	1.127E-01	6.52E-02	G
		1120.28	3.371E-01	@(P	2.056E-01	8.56E-02	G
RA-224	5.6900E-01						
		241.00	5.690E-01	&(	7.639E-01	2.35E-01	G
RA-226	9.6520E-01						
		185.99	9.652E-01	*(P	8.663E-01	2.69E-01	G
AC-228	4.3996E-01						
		911.07	4.365E-01	(P	8.609E-02	4.33E-02	G K
		968.90	4.661E-01	(P	1.352E-01	6.00E-02	G
		338.40	4.102E-01	(P	1.936E-01	7.42E-02	G
TH-227	-5.9984E-02						
		236.00	-5.998E-02	&(	2.864E-01	8.57E-02	G K
		256.25	-1.764E-02	% P	3.537E-01	1.04E-01	G
PA-234	-5.9033E-02						
		98.44	-5.903E-02	%(P	1.608E-01	4.84E-02	G K
		946.00	1.944E-02	& P	1.360E-01	3.89E-02	G
		131.28	-1.752E-02	& P	1.643E-01	4.90E-02	G
		94.67	-1.425E-01	% P	3.206E-01	9.71E-02	G
		883.24	0.000E+00	&	2.305E-01	6.46E-02	G
		926.70	5.479E-02	&	2.262E-01	6.57E-02	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26-1.133E-02 & P 2.370E-01 6.69E-02 G

TH-234      -2.8613E-01
                           63.29-2.861E-01 %(P 4.364E+00 1.28E+00 G K
                           92.80 9.464E-01 % P 1.673E+00 5.06E-01 G
                           92.38 1.046E+00 % P 2.017E+00 6.09E-01 G

AM-241       1.3338E-01
                           59.54 1.334E-01 %(P 8.507E-01 2.54E-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	-5.8590E-03	-6.0903E-03	2.2232E-01	2.2232E-01	2.469E-01
K-40		1.0332E+01	1.0332E+01	1.0400E+00	1.2006E+00	
MN-54	#A	-1.9228E-04	-1.9356E-04	1.4684E-01	1.4684E-01	2.804E-02
CO-57	#B	-1.1702E-02	-1.1792E-02	3.7251E-02	3.7257E-02	4.000E-02
CO-60	#B	-3.8777E-03	-3.8819E-03	1.3576E-01	1.3576E-01	2.827E-02

Sr-85	#A	-1.1457E-02	-1.1828E-02	2.9555E-02	2.9563E-02	3.180E-02
Kr-85	#A	-2.6455E+02	-2.6456E+02	6.6091E+02	6.6109E+02	7.342E+02
Y-88	#B	-2.1741E-03	-2.2167E-03	2.0425E-02	2.0426E-02	2.330E-02
NB-94	#B	1.9674E-04	1.9674E-04	1.8743E-02	1.8743E-02	2.263E-02
Ag-108M	#B	4.1383E-03	4.1385E-03	2.8193E-02	2.8194E-02	3.242E-02
CD-109	#A	8.1276E-01	8.1647E-01	1.3248E+00	1.3256E+00	1.444E+00
SN-113	#B	-3.3901E-03	-3.4516E-03	3.3868E-02	3.3868E-02	3.794E-02
SB-125	#B	9.2769E-03	9.2959E-03	6.4023E-02	6.4026E-02	7.314E-02
I-131	#B	6.5645E-03	8.4896E-03	3.2823E-02	3.2827E-02	2.858E-02
CS-134	#B	1.4389E-02	1.4429E-02	1.2156E-02	1.2185E-02	2.994E-02
CS-137	#A	1.2434E-02	1.2436E-02	2.6570E-02	2.6579E-02	2.957E-02
CE-139	#A	-1.1649E-02	-1.1826E-02	3.0844E-02	3.0852E-02	3.363E-02
EU-152	#B	-3.4600E-02	-3.4616E-02	1.1167E-01	1.1169E-01	1.173E-01
EU-154	#B	-2.4109E-02	-2.4125E-02	7.8048E-02	7.8059E-02	8.649E-02
EU-155	#B	4.6216E-03	4.6269E-03	1.6425E-01	1.6425E-01	1.839E-01
HG-203	#B	-2.6499E-03	-2.7701E-03	2.9495E-02	2.9496E-02	3.152E-02
TL-208	#	1.7012E-01	1.7012E-01	4.1990E-02	4.3136E-02	
PB-212		4.1070E-01	4.1070E-01	8.5118E-02	8.8395E-02	
PB-214		3.1881E-01	3.1881E-01	9.1406E-02	9.3261E-02	
BI-212	#	2.6661E-01	2.6661E-01	2.4529E-01	2.4577E-01	2.527E-01
BI-214		2.7707E-01	2.7707E-01	9.8031E-02	9.9342E-02	
RA-224	#A	5.6900E-01	5.6900E-01	7.0467E-01	7.0544E-01	7.639E-01
RA-226	#	9.6520E-01	9.6520E-01	8.0817E-01	8.1011E-01	8.663E-01
AC-228		4.3996E-01	4.3996E-01	1.0693E-01	1.0994E-01	
TH-227	#B	-5.9984E-02	-5.9984E-02	2.5713E-01	2.5715E-01	2.864E-01
PA-234	#B	-5.9033E-02	-5.9033E-02	1.5255E-01	1.5259E-01	1.608E-01
TH-234	#B	-2.8613E-01	-2.8613E-01	3.6305E+01	3.6305E+01	4.364E+00
AM-241	#A	1.3337E-01	1.3338E-01	7.6075E-01	7.6078E-01	8.507E-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) 1.1948901E+01 pCi/gm
Total Decayed Activity (1120.0 to 2000.7 keV) 1.1948901E+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_10JUN2006_1435.An1

Sample description
OOL-10-03-002-C

Spectrum Filename: C:\GammaVision\Spectra\107_10JUN2006_1435.An1

Acquisition information
Start time: 10-Jun-2006 14:35:35
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: 1.7180E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.7180E+03) =
5.8207E+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	10-Jun-2006 13:00:00
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: 0.1600

***** 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	244.	15.68	1.18	2.849E-02	72.87	6.400	1.093E+00	HG203
					74.81	9.600	7.019E-01	PB212
77.10	230.	14.70	1.18	2.957E-02	77.11	17.500	5.909E-01	PB212
					77.11	10.700	9.546E-01	PB214
77.15	153.	28.99	1.50	2.957E-02	77.11	17.500	PBC<MDA	PB212
					77.11	10.700	PBC<MDA	PB214
92.53	228.	23.56	1.76	3.433E-02	92.38	2.570	1.967E+00	TH234
					92.80	3.000	1.591E+00	TH234
186.47	205.	20.50	1.74	3.607E-02	185.99	3.280	1.360E+00	RA226
209.10	149.	28.95	1.67	3.430E-02				
238.76	1003.	4.17	1.30	3.187E-02	238.63	43.100	5.647E-01	PB212
241.51	180.	17.30	1.30	3.165E-02	241.00	3.900	1.133E+00	RA224
					241.92	7.470	5.955E-01	PB214
270.80	117.	25.29	0.79	2.940E-02				
278.64	116.	27.28	1.31	2.883E-02				
278.64	116.	27.28	1.31	2.883E-02	279.17	81.500	3.852E-02	HG203
295.35	235.	10.73	1.34	2.767E-02	295.22	19.200	3.406E-01	PB214
300.21	59.	32.85	1.34	2.735E-02				
338.48	272.	10.07	1.51	2.500E-02	338.40	12.010	7.040E-01	AC228
352.08	477.	6.80	1.55	2.425E-02	351.99	37.100	4.124E-01	PB214
510.77	156.	16.55	1.90	1.808E-02	510.72	22.500	2.373E-01	TL208
583.42	364.	7.74	1.76	1.628E-02	583.14	86.000	2.015E-01	TL208
600.76	38.	24.24	1.55	1.584E-02	600.77	18.400	PBC<MDA	SB125
					604.66	97.600	1.934E-02	CS134
609.58	324.	9.99	1.88	1.574E-02	609.32	46.090	3.469E-01	BI214
727.39	83.	23.91	1.48	1.374E-02	727.17	11.800	3.973E-01	BI212
795.05	86.	23.41	1.43	1.285E-02				

795.05	86.	23.41	1.43	1.285E-02	795.76	85.400	6.132E-02	CS134
911.30	280.	9.69	1.99	1.161E-02	911.07	29.000	6.444E-01	AC228
964.67	50.	25.48	1.80	1.113E-02	964.00	14.580	PBC<MDA	EU152
969.33	162.	10.43	1.80	1.109E-02	968.90	17.460	6.475E-01	AC228

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
1121.17	97.	21.69	0.81	9.970E-03	1120.28	15.040	5.068E-01	BI214
1461.16	1582.	2.61	2.42	8.189E-03	1460.75	10.700	1.416E+01	K40
1765.24	50.	14.97	2.29	7.084E-03	1764.51	15.920	3.481E-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 Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
417.84	209.10	591.	149.	0.075	86.84	1.669	AC-228	s
541.23	270.80	293.	117.	0.059	75.87	0.791	AC-228	s
556.90	278.64	335.	87.	0.044	94.55	1.306	SB-126	s
600.04	300.15	157.	59.	0.029	98.56	1.341	PB-212	lD
1929.54	964.58	58.	48.	0.024	80.81	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	636.	244.	0.122	47.04	1.178D
PB-212	153.89	77.11	666.	230.	0.115	44.10	1.179A
PB-214	153.89	77.11	1101.	153.	0.076	86.97	1.500A
TH-234	185.48	92.91	1215.	169.	0.085	86.25	1.500s
TH-234	185.46	92.90	1172.	164.	0.082	81.59	1.500s
RA-226	372.58	186.47	576.	205.	0.102	61.50	1.741s
TH-227	471.75	236.06	1136.	-149.	-0.074	99.49	1.500s
PB-212	476.89	238.63	334.	987.	0.493	12.12	1.297D
PB-214	483.47	241.92	440.	163.	0.082	58.79	1.299D
PB-214	590.34	295.36	442.	325.	0.162	39.27	1.845s
AC-228	676.48	338.43	265.	271.	0.135	36.98	1.504s
PB-214	703.78	352.08	197.	472.	0.236	20.41	1.549s
TL-208	1021.12	510.77	194.	123.	0.061	49.66	1.902s
TL-208	1166.43	583.42	127.	359.	0.179	23.23	1.761s
CS-134	1201.10	600.76	25.	38.	0.019	72.72	1.555s
BI-214	1218.75	609.58	181.	320.	0.160	29.96	1.875s
BI-212	1454.35	727.39	102.	82.	0.041	71.72	1.483
CS-134	1590.09	795.26	65.	57.	0.029	70.74	1.684s
AC-228	1822.17	911.30	118.	276.	0.138	29.07	1.989s
AC-228	1937.36	968.90	68.	159.	0.079	31.89	1.799D
BI-214	2241.91	1121.17	95.	97.	0.048	65.06	0.812s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
K-40	2921.92	1461.16	28.	1577.	0.789	7.84	2.423
BI-214	3530.14	1765.24	3.	50.	0.025	44.91	2.292s

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		-4.5359E-02					
			477.56	-4.536E-02	%(	2.199E-01 6.49E-02	G
K-40		1.4156E+01					
			1460.75	1.416E+01	(P	2.446E-01 3.71E-01	G
MN-54		1.4752E-03					
			834.81	1.475E-03	&(P	3.171E-02 9.14E-03	G
CO-57		4.3356E-04					
			122.07	4.336E-04	&(P	3.375E-02 1.00E-02	G K
			136.43	-5.422E-02	% P	2.805E-01 8.42E-02	G
CO-60		-8.3691E-03					
			1332.51	-8.369E-03	%(P	3.300E-02 9.19E-03	G K
			1173.23	-5.191E-03	% P	4.436E-02 1.26E-02	G K
Sr-85		-1.3312E-02					
			514.00	-1.331E-02	%(	3.297E-02 9.94E-03	G
Kr-85		-3.3844E+02					
			513.99	-3.384E+02	%(P	7.655E+02 2.29E+02	G
Y-88		4.7008E-03					
			1836.01	4.701E-03	&(P	1.979E-02 5.47E-03	G K
			898.02	-2.218E-03	& P	2.750E-02 7.71E-03	G
NB-94		5.1048E-03					
			871.10	5.105E-03	%(P	2.570E-02 7.48E-03	G K
			702.50	2.761E-04	& P	2.369E-02 6.73E-03	G K
Ag-108M		-1.2813E-02					
			722.95	-1.281E-02	%(	3.747E-02 1.12E-02	G K
			614.37	-2.146E-02	%	3.721E-02 1.14E-02	G
			433.93	3.346E-03	& P	2.800E-02 8.22E-03	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CD-109	1.0427E-01						
		88.04	1.043E-01	%(P	1.115E+00	3.34E-01	G
SN-113	9.7881E-03						
		391.71	9.788E-03	%(P	3.010E-02	8.96E-03	G K
		255.04	-2.524E-01	%	1.243E+00	3.71E-01	G
SB-125	1.8429E-03						
		427.95	1.843E-03	%(P	7.884E-02	2.29E-02	G K
		600.77	2.554E-02	% P	1.164E-01	3.40E-02	G
		636.15	-6.468E-02	% P	2.336E-01	6.90E-02	G
		463.51	1.525E-01	% P	2.449E-01	7.49E-02	G
		176.29	-8.484E-02	& P	4.243E-01	1.27E-01	G
I-131	2.9352E-03						
		364.48	2.935E-03	&(	2.667E-02	7.83E-03	G K
		636.97	-9.380E-02	%	3.424E-01	1.01E-01	G
		284.29	-1.351E-01	%	4.119E-01	1.24E-01	G
CS-134	1.9338E-02						
		604.66	1.934E-02	(P	1.320E-02	4.75E-03	G K
		795.76	4.110E-02	+ P	2.881E-02	9.78E-03	G
		569.29	6.837E-03	%	1.489E-01	4.29E-02	G
		801.84	-9.038E-02	% P	3.359E-01	9.92E-02	G
CS-137	7.8234E-03						
		661.62	7.823E-03	%(P	3.189E-02	9.35E-03	G
CE-139	4.6997E-04						
		165.85	4.700E-04	&(P	3.156E-02	9.37E-03	G
EU-152	-2.7587E-03						
		121.78	-2.759E-03	&(P	9.396E-02	2.80E-02	G K
		344.30	1.046E-02	% P	6.987E-02	2.05E-02	G
		1408.08	9.137E-02	% P	1.244E-01	3.94E-02	G
		964.00	-1.459E-02	& P	2.867E-01	8.34E-02	G
		1112.07	5.544E-02	% P	2.716E-01	7.96E-02	G
		778.90	5.045E-02	& P	1.921E-01	5.65E-02	G
EU-154	-4.7227E-03						
		123.10	-4.723E-03	&(P	7.251E-02	2.16E-02	G K
		1274.80	2.460E-02	% P	9.269E-02	2.72E-02	G
		723.30	-7.539E-02	% P	1.874E-01	5.64E-02	G
		1004.80	-5.928E-04	% P	1.757E-01	4.99E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
EU-155	7.9676E-02						
		86.45	7.968E-02	%(	1.220E-01	3.72E-02	G K
		105.31	7.510E-02	% P	1.364E-01	4.15E-02	G
HG-203	9.2357E-03						
		279.17	9.236E-03	%(P	2.908E-02	8.72E-03	G K
		72.87	-8.951E-03	& P	8.100E-01	2.42E-01	G
		70.83	-3.315E-01	%	9.999E-01	3.01E-01	G
		82.50	-3.873E-02	%	1.625E+00	4.85E-01	G
TL-208	2.0897E-01						
		583.14	2.015E-01	*(P	3.101E-02	1.58E-02	G
		510.72	2.373E-01	*(P	1.308E-01	5.01E-02	G
PB-212	5.7217E-01						
		238.63	5.646E-01	(P	5.031E-02	2.32E-02	G K
							Energy duplication
		77.11	3.489E-01	}	1.869E-01	5.13E-02	G
		74.81	7.019E-01	+ P	3.457E-01	1.12E-01	G
PB-214	4.3583E-01						
		351.99	4.124E-01	*(P	5.955E-02	2.84E-02	G K
		295.22	4.810E-01	*(P	1.490E-01	6.39E-02	G
							Energy duplication
		77.11	3.793E-01	} P	3.910E-01	1.10E-01	G
		241.92	5.434E-01	+ P	3.343E-01	1.07E-01	G
BI-212	3.9732E-01						
		727.17	3.973E-01	(P	2.415E-01	9.65E-02	G K
		1620.56	-1.898E-02	% P	1.411E+00	3.95E-01	G
		785.42	5.593E-01	% P	1.237E+00	3.72E-01	G
BI-214	3.4720E-01						
		609.32	3.469E-01	(P	7.091E-02	3.51E-02	G K
		1764.51	3.481E-01	(P	7.609E-02	5.31E-02	G
		1120.28	5.068E-01	+ P	2.530E-01	1.11E-01	G
RA-224	4.1943E-01						
		241.00	4.194E-01	&(P	9.418E-01	2.85E-01	G
RA-226	1.3598E+00						
		185.99	1.360E+00	*(	7.611E-01	2.79E-01	G
AC-228	6.5774E-01						
		911.07	6.444E-01	@(P	1.247E-01	6.34E-02	G K
		968.90	6.449E-01	(P	1.673E-01	6.95E-02	G
		338.40	7.088E-01	*(P	2.060E-01	8.84E-02	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments

TH-227      -3.2510E-01
                          236.00-3.251E-01 &(P 3.495E-01 1.08E-01 G K
                          256.25-8.318E-02 % P 3.644E-01 1.08E-01 G

PA-234      -3.0781E-02
                           98.44-3.078E-02 &(  1.230E-01 3.70E-02 G K
                          946.00 0.000E+00 &   2.143E-01 6.22E-02 G
                          131.28 5.701E-02 %   1.497E-01 4.52E-02 G
                           94.67-8.583E-02 %   2.379E-01 7.19E-02 G
                          883.24 5.064E-02 %   2.036E-01 5.96E-02 G
                          926.70 1.066E-02 &   2.490E-01 7.09E-02 G
                          569.26 1.017E-02 %   2.209E-01 6.37E-02 G

TH-234       9.1145E-01
                           63.29 2.585E-01 &(P 1.573E+00 4.70E-01 G K
                           92.80 1.248E+00 *(P 1.237E+00 3.80E-01 G
                           92.38 1.509E+00 *(P 1.474E+00 4.54E-01 G

AM-241      -6.4051E-03
                           59.54-6.405E-03 &(P 1.712E-01 5.09E-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

- -

***** 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	-4.5320E-02	-4.5359E-02	1.9457E-01	1.9459E-01	2.197E-01
K-40		1.4156E+01	1.4156E+01	1.1136E+00	1.3925E+00	
MN-54	#A	1.4750E-03	1.4752E-03	2.7431E-02	2.7431E-02	3.171E-02
CO-57	#B	4.3349E-04	4.3356E-04	3.0141E-02	3.0141E-02	3.374E-02
CO-60	#B	-8.3689E-03	-8.3691E-03	6.4836E-02	6.4837E-02	3.300E-02
Sr-85	#A	-1.3303E-02	-1.3312E-02	2.9832E-02	2.9842E-02	3.295E-02
Kr-85	#A	-3.3844E+02	-3.3844E+02	8.2442E+02	8.2466E+02	7.655E+02
Y-88	#B	4.6988E-03	4.7008E-03	1.6411E-02	1.6413E-02	1.978E-02
NB-94	#B	5.1048E-03	5.1048E-03	2.2446E-02	2.2448E-02	2.570E-02
Ag-108M	#B	-1.2813E-02	-1.2813E-02	3.3658E-02	3.3667E-02	3.747E-02
CD-109	#A	1.0426E-01	1.0427E-01	1.0027E+00	1.0027E+00	1.115E+00
SN-113	#B	9.7842E-03	9.7881E-03	2.6872E-02	2.6879E-02	3.009E-02
SB-125	#B	1.8428E-03	1.8429E-03	6.8629E-02	6.8629E-02	7.883E-02
I-131	#B	2.9184E-03	2.9352E-03	2.3495E-02	2.3496E-02	2.652E-02
CS-134	#	1.9337E-02	1.9338E-02	1.4257E-02	1.4303E-02	1.320E-02
CS-137	#A	7.8234E-03	7.8234E-03	2.8055E-02	2.8059E-02	3.189E-02
CE-139	#A	4.6981E-04	4.6997E-04	2.8101E-02	2.8101E-02	3.155E-02
EU-152	#B	-2.7587E-03	-2.7587E-03	9.0066E-02	9.0066E-02	9.396E-02
EU-154	#B	-4.7226E-03	-4.7227E-03	7.2967E-02	7.2968E-02	7.251E-02
EU-155	#B	7.9674E-02	7.9676E-02	1.1164E-01	1.1173E-01	1.220E-01
HG-203	#B	9.2266E-03	9.2357E-03	2.6163E-02	2.6169E-02	2.905E-02
TL-208	#	2.0897E-01	2.0897E-01	4.9157E-02	5.0682E-02	
PB-212		5.7217E-01	5.7217E-01	7.0443E-02	7.8129E-02	
PB-214		4.3583E-01	4.3583E-01	8.9911E-02	9.3523E-02	
BI-212		3.9732E-01	3.9732E-01	2.8946E-01	2.9041E-01	
BI-214		3.4720E-01	3.4720E-01	9.5276E-02	9.7458E-02	
RA-224	#A	4.1943E-01	4.1943E-01	8.5544E-01	8.5580E-01	9.418E-01
RA-226	#	1.3598E+00	1.3598E+00	8.3620E-01	8.4005E-01	
AC-228		6.5774E-01	6.5774E-01	1.2628E-01	1.3212E-01	
TH-227	#A	-3.2510E-01	-3.2510E-01	3.2403E-01	3.2460E-01	3.495E-01
PA-234	#B	-3.0781E-02	-3.0781E-02	1.1091E-01	1.1092E-01	1.230E-01
TH-234	#B	9.1145E-01	9.1145E-01	8.2320E-01	8.2475E-01	1.573E+00
AM-241	#A	-6.4051E-03	-6.4051E-03	2.0018E-01	2.0018E-01	1.712E-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: 107_10JUN2006_1435.An1

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

Total Activity (1120.2 to 2000.1 keV) 1.8134729E+01 pCi/gm
Total Decayed Activity (1120.2 to 2000.1 keV) 1.8134729E+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_6JULY2006_0805.An1

Sample description
FSS-OOL-10-03-008-F

Spectrum Filename: C:\GammaVision\Spectra\107F_6JULY2006_0805.An1

Acquisition information
Start time: 06-Jul-2006 08:05:22
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: 1.9170E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.9170E+03) =
5.2165E+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	26-Jun-2006 16:08:00
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. 18 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.0495

***** 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	327.	13.73	1.18	2.849E-02	74.81	9.600	8.432E-01	PB212
76.99	454.	9.45	1.18	2.957E-02	77.11	17.500	8.619E-01	PB212
					77.11	10.700	1.399E+00	PB214
77.20	158.	33.48	1.50	2.957E-02	77.11	17.500	PBC<MDA	PB212
					77.11	10.700	PBC<MDA	PB214
87.09	144.	41.41	1.50	3.284E-02	86.45	32.740	PBC<MDA	EU155
					88.04	3.790	PBC<MDA	CD109
92.93	186.	30.03	1.50	3.429E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
92.94	174.	29.62	1.50	3.438E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
185.96	270.	19.02	1.61	3.610E-02	185.99	3.280	1.605E+00	RA226
209.00	178.	26.24	1.74	3.431E-02				
238.70	1531.	3.31	1.30	3.188E-02	238.63	43.100	7.768E-01	PB212
					241.00	3.900	8.713E+00	RA224
241.45	255.	17.87	1.30	3.166E-02	241.92	7.470	7.572E-01	PB214
269.57	166.	21.58	1.63	2.949E-02				
277.01	79.	41.29	0.96	2.895E-02				
295.38	276.	9.86	1.34	2.767E-02	295.22	19.200	3.602E-01	PB214
300.11	106.	21.66	1.34	2.735E-02				
329.09	106.	30.36	0.92	2.554E-02				
338.55	366.	9.84	1.79	2.499E-02	338.40	12.010	8.514E-01	AC228
351.87	583.	7.92	1.84	2.426E-02	351.99	37.100	4.524E-01	PB214
462.82	134.	15.49	1.72	1.955E-02				
462.82	134.	15.49	1.72	1.955E-02	463.51	10.000	4.760E-01	SB125
510.91	278.	13.20	2.04	1.808E-02	510.72	22.500	4.234E-01	TL208
583.26	534.	6.74	1.77	1.629E-02	583.14	86.000	2.662E-01	TL208

609.32	417.	7.37	1.41	1.574E-02	609.32	46.090	4.008E-01	BI214
727.27	173.	13.62	2.39	1.374E-02	727.17	11.800	7.473E-01	BI212
742.83	40.	36.06	1.35	1.352E-02				
795.08	68.	21.73	1.68	1.284E-02	795.76	85.400	4.425E-02	CS134
860.79	104.	26.09	1.53	1.211E-02				
911.20	429.	6.79	1.80	1.161E-02	911.07	29.000	8.889E-01	AC228
965.03	64.	21.78	1.80	1.113E-02	964.00	14.580	PBC<MDA	EU152

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
969.19	226.	8.45	1.80	1.109E-02	968.90	17.460	8.156E-01	AC228
1120.56	93.	23.78	2.30	9.970E-03	1120.28	15.040	4.349E-01	BI214
1460.69	1862.	2.37	2.08	8.191E-03	1460.75	10.700	1.494E+01	K40
1764.29	79.	12.37	1.96	7.084E-03	1764.51	15.920	4.957E-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	
417.65	209.00	743.	178.	0.089	78.72	1.745	AC-228	s
538.77	269.57	416.	166.	0.083	64.74	1.631	AC-228	s
553.64	277.01	383.	77.	0.039	112.94	0.964	TL-208	s
599.81	300.09	264.	87.	0.043	87.33	1.736	PB-212	sM
657.79	329.09	329.	106.	0.053	91.08	0.919	LA-140	s
1485.23	742.83	70.	40.	0.020	108.17	1.346	PA-234	
1721.15	860.79	149.	104.	0.052	57.53	1.533	TL-208	s
1929.96	964.92	68.	61.	0.031	68.83	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	871.	327.	0.164	41.18	1.178D
PB-212	153.89	77.11	847.	454.	0.227	28.36	1.179A
PB-214	153.89	77.11	1537.	158.	0.079	100.44	1.500A
EU-155	173.84	87.09	1696.	144.	0.072	124.22	1.500s
TH-234	185.52	92.93	1603.	186.	0.093	90.10	1.500
TH-234	185.55	92.94	1574.	174.	0.087	88.87	1.500
RA-226	371.57	185.96	842.	270.	0.135	57.05	1.611s
TH-227	471.71	236.04	1581.	-203.	-0.101	85.93	1.500s
PB-212	476.89	238.63	453.	1508.	0.754	9.64	1.297D
RA-224	477.09	238.73	686.	1515.	0.758	10.62	1.500
PB-214	483.47	241.92	556.	213.	0.106	50.99	1.299D
PB-214	590.36	295.37	430.	268.	0.134	41.42	1.649s
AC-228	676.72	338.55	324.	363.	0.181	29.53	1.793s
PB-214	703.35	351.87	402.	578.	0.289	23.77	1.841s
SB-125	925.64	463.02	139.	111.	0.055	51.93	1.500s
TL-208	1021.41	510.91	301.	244.	0.122	39.59	2.040s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
TL-208	1166.09	583.26	222.	529.	0.264	20.23	1.773s
BI-214	1218.21	609.32	174.	413.	0.206	22.11	1.412
BI-212	1454.12	727.27	114.	172.	0.086	40.87	2.394s
CS-134	1589.72	795.08	78.	68.	0.034	65.18	1.684s
AC-228	1821.96	911.20	112.	424.	0.212	20.37	1.803
AC-228	1937.36	968.90	80.	224.	0.112	25.91	1.799D
BI-214	2240.68	1120.56	118.	93.	0.046	71.34	2.298s
K-40	2920.99	1460.69	23.	1857.	0.929	7.11	2.077
BI-214	3528.23	1764.29	5.	79.	0.040	37.11	1.964

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		-4.3375E-02					
			477.56	-4.338E-02	&(	2.469E-01 7.28E-02	G
K-40		1.4938E+01					
			1460.75	1.494E+01	(P	2.005E-01 3.55E-01	G
MN-54		1.7105E-03					
			834.81	1.711E-03	&(P	2.532E-02 7.26E-03	G
CO-57		-9.3051E-04					
			122.07	-9.305E-04	%(P	2.770E-02 8.23E-03	G K
			136.43	-2.493E-02	% P	2.861E-01 8.56E-02	G
CO-60		-7.3056E-03					
			1332.51	-7.306E-03	%(P	2.956E-02 8.22E-03	G K
			1173.23	3.711E-04	% P	4.266E-02 1.23E-02	G K
Sr-85		-1.7516E-02					
			514.00	-1.752E-02	%(	3.889E-02 1.18E-02	G
Kr-85		-3.9192E+02					
			513.99	-3.919E+02	%(P	8.132E+02 2.45E+02	G
Y-88		-5.8512E-03					
			1836.01	-5.851E-03	%(P	2.552E-02 7.09E-03	G K
			898.02	-1.053E-03	% P	3.386E-02 9.64E-03	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
NB-94	8.6590E-03						
		871.10	8.659E-03	%(P	2.602E-02	7.75E-03	G K
		702.50	-8.414E-04	% P	3.076E-02	8.92E-03	G K
Ag-108M	-1.4754E-02						
		722.95	-1.475E-02	%(	3.958E-02	1.19E-02	G K
		614.37	-2.020E-02	%	3.569E-02	1.09E-02	G
		433.93	-5.732E-03	% P	2.740E-02	8.09E-03	G
CD-109	-2.5977E-02						
		88.04	-2.598E-02	%(P	1.165E+00	3.49E-01	G
SN-113	-1.1399E-03						
		391.71	-1.140E-03	%(P	3.864E-02	1.13E-02	G K
		255.04	3.390E-03	%	1.215E+00	3.59E-01	G
SB-125	9.8620E-02						
		427.95	-4.070E-03	%(P	7.753E-02	2.26E-02	G K
		600.77	-1.279E-02	& P	1.559E-01	4.54E-02	G
		636.15	-2.488E-03	% P	2.293E-01	6.60E-02	G
		463.51	4.026E-01	*(P	2.098E-01	7.15E-02	G
		176.29	-9.535E-02	% P	4.253E-01	1.27E-01	G
I-131	-1.1997E-02						
		364.48	-1.200E-02	%(	6.901E-02	2.05E-02	G K
		636.97	3.155E-01	%	7.514E-01	2.26E-01	G
		284.29	-2.550E-02	%	8.703E-01	2.57E-01	G
CS-134	2.0249E-02						
		604.66	-7.487E-04	%(P	6.581E-02	1.96E-02	G K
		795.76	4.425E-02	(P	2.840E-02	9.69E-03	G
		569.29	4.860E-03	%	1.577E-01	4.57E-02	G
		801.84	-7.488E-03	& P	3.335E-01	9.60E-02	G
CS-137	4.9970E-03						
		661.62	4.997E-03	&(P	3.492E-02	1.02E-02	G
CE-139	5.4743E-03						
		165.85	5.474E-03	&(P	3.621E-02	1.08E-02	G
EU-152	-3.6336E-03						
		121.78	-3.634E-03	%(P	1.041E-01	3.11E-02	G K
		344.30	-3.238E-02	% P	9.193E-02	2.76E-02	G
		1408.08	3.671E-02	% P	1.017E-01	2.99E-02	G
		964.00	5.442E-02	& P	3.141E-01	9.30E-02	G
		1112.07	4.165E-02	& P	2.451E-01	7.15E-02	G
		778.90	-3.078E-02	& P	2.196E-01	6.40E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
EU-154	-9.9791E-03						
		123.10	-9.979E-03	&(P	7.693E-02	2.31E-02	G K
		1274.80	5.976E-03	& P	1.048E-01	3.02E-02	G
		723.30	-7.416E-02	% P	1.935E-01	5.82E-02	G
		1004.80	-2.436E-04	% P	1.935E-01	5.56E-02	G
EU-155	9.4495E-02						
		86.45	9.449E-02	(	1.281E-01	3.91E-02	G K
		105.31	2.291E-02	% P	1.454E-01	4.36E-02	G
HG-203	2.8924E-04						
		279.17	2.892E-04	&(P	3.434E-02	1.01E-02	G K
		72.87	-3.791E-01	% P	1.103E+00	3.34E-01	G
		70.83	-1.201E+00	%	1.785E+00	5.44E-01	G
		82.50	-3.534E-01	%	2.053E+00	6.17E-01	G
TL-208	2.6616E-01						
		583.14	2.662E-01	(P	3.630E-02	1.81E-02	G
		510.72	4.234E-01	+ P	1.447E-01	6.36E-02	G
PB-212	8.0485E-01						
		238.63	7.731E-01	(P	5.227E-02	2.51E-02	G K
							Energy duplication
		77.11	6.181E-01	}	1.884E-01	5.84E-02	G
		74.81	8.432E-01	(P	3.614E-01	1.17E-01	G
PB-214	4.5241E-01						
		351.99	4.524E-01	*(P	7.534E-02	3.62E-02	G K
		295.22	3.562E-01	- P	1.317E-01	5.00E-02	G
							Energy duplication
		77.11	3.522E-01	} P	4.130E-01	1.18E-01	G
		241.92	6.343E-01	+ P	3.360E-01	1.09E-01	G
BI-212	7.4731E-01						
		727.17	7.473E-01	*(P	2.281E-01	1.03E-01	G K
		1620.56	1.733E-01	% P	7.278E-01	2.06E-01	G
		785.42	-2.000E-03	% P	1.603E+00	4.63E-01	G
BI-214	4.0923E-01						
		609.32	4.008E-01	(P	6.243E-02	2.99E-02	G K
		1764.51	4.957E-01	+ P	8.006E-02	6.20E-02	G
		1120.28	4.349E-01	(P	2.512E-01	1.04E-01	G
RA-224	8.6392E+00						
		241.00	8.639E+00	?(P	7.113E-01	3.06E-01	G
RA-226	1.6050E+00						
		185.99	1.605E+00	*(	8.213E-01	3.05E-01	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments

AC-228       8.5919E-01
                          911.07 8.889E-01  (P 1.087E-01 6.10E-02 G K
                          968.90 8.153E-01  (P 1.616E-01 7.11E-02 G
                          338.40 8.514E-01 *(P 2.034E-01 8.46E-02 G

TH-227      -3.9744E-01
                          236.00-3.974E-01 ?(P 3.685E-01 1.14E-01 G K
                          256.25-4.818E-02 % P 3.568E-01 1.06E-01 G

PA-234      -1.6309E-03
                           98.44-1.631E-03 %(  1.338E-01 4.00E-02 G K
                          946.00-4.426E-02 &   1.674E-01 4.97E-02 G
                          131.28-2.600E-02 %   1.557E-01 4.68E-02 G
                           94.67-8.715E-02 %   2.509E-01 7.58E-02 G
                          883.24-3.222E-02 %   2.289E-01 6.66E-02 G
                          926.70 6.638E-02 %   2.465E-01 7.28E-02 G
                          569.26 1.246E-02 %   2.160E-01 6.26E-02 G

TH-234       1.0563E+00
                           63.29 6.698E-01 %(P 1.567E+00 4.73E-01 G K
                           92.80 1.191E+00  (P 1.282E+00 3.93E-01 G
                           92.38 1.485E+00  (P 1.514E+00 4.65E-01 G

AM-241      -6.9405E-02
                           59.54-6.941E-02 &(P 2.218E-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
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	-3.8261E-02	-4.3375E-02	2.1844E-01	2.1846E-01	2.178E-01
K-40		1.4938E+01	1.4938E+01	1.0641E+00	1.3823E+00	
MN-54	#A	1.6742E-03	1.7105E-03	2.1795E-02	2.1795E-02	2.478E-02
CO-57	#B	-9.0770E-04	-9.3051E-04	2.8186E-02	2.8186E-02	2.702E-02
CO-60	#B	-7.2802E-03	-7.3056E-03	5.9689E-02	5.9690E-02	2.946E-02
Sr-85	#A	-1.5796E-02	-1.7516E-02	3.5320E-02	3.5336E-02	3.508E-02
Kr-85	#A	-3.9189E+02	-3.9192E+02	8.4537E+02	8.4568E+02	8.132E+02
Y-88	#B	-5.4948E-03	-5.8512E-03	2.8950E-02	2.8952E-02	2.396E-02
NB-94	#B	8.6590E-03	8.6590E-03	2.3236E-02	2.3241E-02	2.602E-02
Ag-108M	#B	-1.4752E-02	-1.4754E-02	3.5709E-02	3.5720E-02	3.958E-02
CD-109	#A	-2.5596E-02	-2.5977E-02	1.2047E+00	1.2047E+00	1.148E+00
SN-113	#B	-1.0755E-03	-1.1399E-03	3.6359E-01	3.6359E-01	3.645E-02
SB-125	#F	9.7969E-02	9.8620E-02	5.2516E-02	5.2838E-02	7.702E-02
I-131	#B	-5.2145E-03	-1.1997E-02	6.1490E-02	6.1494E-02	2.999E-02
CS-134	#B	2.0069E-02	2.0249E-02	1.3301E-02	1.3355E-02	6.523E-02
CS-137	#A	4.9940E-03	4.9970E-03	3.0653E-02	3.0655E-02	3.490E-02
CE-139	#A	5.2140E-03	5.4743E-03	3.2540E-02	3.2541E-02	3.449E-02
EU-152	#B	-3.6284E-03	-3.6336E-03	9.7912E-02	9.7913E-02	1.039E-01
EU-154	#B	-9.9576E-03	-9.9791E-03	7.2717E-02	7.2719E-02	7.676E-02
EU-155	#A	9.4146E-02	9.4495E-02	1.1738E-01	1.1750E-01	1.276E-01
HG-203	#B	2.5050E-04	2.8924E-04	3.0401E-02	3.0401E-02	2.974E-02
TL-208	#	2.6616E-01	2.6616E-01	5.4318E-02	5.6547E-02	
PB-212		8.0485E-01	8.0485E-01	7.8433E-02	9.1713E-02	
PB-214		4.5241E-01	4.5241E-01	1.0850E-01	1.1174E-01	
BI-212	#	7.4731E-01	7.4731E-01	3.0770E-01	3.1085E-01	
BI-214		4.0923E-01	4.0923E-01	9.1438E-02	9.4579E-02	
RA-224	#	8.6392E+00	8.6392E+00	9.1866E-01	1.0508E+00	7.113E-01
RA-226	#	1.6050E+00	1.6050E+00	9.1561E-01	9.2050E-01	
AC-228		8.5919E-01	8.5919E-01	1.2794E-01	1.3763E-01	
TH-227	#A	-3.9744E-01	-3.9744E-01	3.4198E-01	3.4278E-01	3.685E-01
PA-234	#B	-1.6309E-03	-1.6309E-03	1.1992E-01	1.1992E-01	1.338E-01
TH-234	#B	1.0563E+00	1.0563E+00	8.8744E-01	8.8937E-01	1.567E+00
AM-241	#A	-6.9402E-02	-6.9405E-02	2.0532E-01	2.0536E-01	2.218E-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) 2.0082464E+01 pCi/gm
Total Decayed Activity (1120.2 to 2000.1 keV) 2.0082483E+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_6JULY2006_0841.An1

Sample description
FSS-OOL-10-03-008-F-RC

Spectrum Filename: C:\GammaVision\Spectra\107F_6JULY2006_0841.An1

Acquisition information
Start time: 06-Jul-2006 08:42:03
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: 1.9170E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.9170E+03) =
5.2165E+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	26-Jun-2006 16:08:00
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. 22 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.1138

***** 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
63.13	133.	40.65	1.20	1.998E-02				
63.13	133.	40.65	1.20	1.998E-02	63.29	3.900	PBC<MDA	TH234
74.78	362.	12.47	1.18	2.849E-02	74.81	9.600	9.324E-01	PB212
77.08	532.	6.85	1.18	2.957E-02	77.11	10.700	1.189E+00	PB214
					77.11	17.500	7.337E-01	PB212
86.85	211.	19.51	1.19	3.298E-02	86.45	32.740	1.387E-01	EU155
					88.04	3.790	1.194E+00	CD109
90.06	157.	25.11	1.19	3.379E-02				
93.16	251.	15.85	1.19	3.448E-02	92.38	2.570	1.945E+00	TH234
					92.80	3.000	1.582E+00	TH234
185.87	271.	19.15	1.73	3.611E-02	185.99	3.280	1.616E+00	RA226
209.71	212.	19.96	1.32	3.425E-02				
238.75	1502.	3.29	1.30	3.187E-02	238.63	43.100	7.620E-01	PB212
241.54	236.	14.70	1.30	3.165E-02	241.00	3.900	1.335E+00	RA224
					241.92	7.470	7.009E-01	PB214
270.54	160.	20.42	2.28	2.942E-02				
277.50	66.	40.54	1.50	2.879E-02	279.17	81.500	PBC<MDA	HG203
295.23	285.	9.60	1.34	2.768E-02	295.22	19.200	3.727E-01	PB214
300.33	89.	24.31	1.34	2.734E-02				
329.06	86.	35.39	1.15	2.554E-02				
338.55	336.	9.62	1.48	2.499E-02	338.40	12.010	7.821E-01	AC228
351.93	598.	6.71	1.43	2.426E-02	351.99	37.100	4.647E-01	PB214
462.81	110.	23.76	1.83	1.955E-02				
462.81	110.	23.76	1.83	1.955E-02	463.51	10.000	3.913E-01	SB125
511.06	234.	14.15	1.89	1.807E-02	510.72	22.500	3.468E-01	TL208
583.22	578.	5.79	1.70	1.629E-02	583.14	86.000	2.886E-01	TL208
609.40	421.	8.58	2.03	1.574E-02	609.32	46.090	4.046E-01	BI214

727.21	159.	17.42	1.73	1.374E-02	727.17	11.800	6.856E-01	BI212
794.84	81.	26.22	1.88	1.285E-02				
794.84	81.	26.22	1.88	1.285E-02	795.76	85.400	5.194E-02	CS134
911.28	468.	7.90	1.77	1.161E-02	911.07	29.000	9.712E-01	AC228
964.67	74.	18.83	1.80	1.113E-02	964.00	14.580	PBC<MDA	EU152
969.15	207.	9.15	1.80	1.109E-02	968.90	17.460	7.457E-01	AC228
1120.33	122.	22.52	1.82	9.970E-03	1120.28	15.040	5.717E-01	BI214

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
1460.85	1755.	2.44	2.21	8.191E-03	1460.75	10.700	1.408E+01	K40
1620.62	23.	34.26	0.75	7.569E-03	1620.56	2.750	7.687E-01	BI212
1764.32	72.	12.82	1.52	7.084E-03	1764.51	15.920	4.488E-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	
173.36	86.95	740.	211.	0.105	58.52	1.187	BI-207	D
179.79	90.17	699.	157.	0.079	75.33	1.189	PB-214	D
185.99	93.27	667.	251.	0.126	47.54	1.191	U-235	D
419.05	209.71	610.	212.	0.106	59.88	1.319	NP-239	s
540.71	270.54	363.	160.	0.080	61.26	2.278	AC-228	s
600.11	300.24	235.	73.	0.036	98.39	1.406	PB-212	M
657.73	329.06	325.	86.	0.043	106.17	1.150	LA-140	s
1929.41	964.71	58.	76.	0.038	54.45	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	861.	362.	0.181	37.42	1.178D
PB-212	153.89	77.11	941.	532.	0.266	20.56	1.179A
EU-155	174.02	87.18	1732.	200.	0.100	90.67	1.500s
CD-109	173.99	87.16	1516.	188.	0.094	90.58	1.500s
TH-234	185.61	92.97	1569.	216.	0.108	73.58	1.500s
RA-226	371.38	185.87	868.	271.	0.136	57.44	1.730s
TH-227	471.65	236.01	1450.	-164.	-0.082	101.58	1.500s
PB-212	476.89	238.63	404.	1486.	0.743	9.53	1.297D
PB-214	483.47	241.92	552.	198.	0.099	54.17	1.299D
HG-203	554.62	277.50	336.	66.	0.033	121.63	1.500s
PB-214	589.97	295.18	471.	413.	0.207	31.40	1.723s
AC-228	676.71	338.55	277.	333.	0.167	28.87	1.479s
PB-214	703.47	351.93	333.	593.	0.297	20.14	1.435
SB-125	926.01	463.21	193.	89.	0.045	70.75	1.500s
TL-208	1021.71	511.06	273.	200.	0.100	42.46	1.886s
TL-208	1166.02	583.22	160.	573.	0.287	17.37	1.699s
BI-214	1218.39	609.40	231.	416.	0.208	25.73	2.032s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
Ag-108M	1223.82	612.12	240.	-59.	-0.030	117.81	1.561s
BI-212	1453.99	727.21	170.	158.	0.079	52.27	1.727s
CS-134	1588.81	794.62	85.	57.	0.029	78.19	1.684
AC-228	1822.13	911.28	184.	464.	0.232	23.71	1.769s
AC-228	1937.36	968.90	87.	205.	0.102	28.11	1.799D
BI-214	2240.22	1120.33	149.	122.	0.061	67.56	1.824s
K-40	2921.29	1460.85	26.	1751.	0.875	7.32	2.209
BI-212	3240.86	1620.62	11.	23.	0.011	102.77	0.750s
BI-214	3528.29	1764.32	4.	72.	0.036	38.47	1.523s

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		7.1033E-02					
			477.56	7.103E-02	%(	2.537E-01 7.56E-02 G	
K-40		1.4081E+01					
			1460.75	1.408E+01	(P	2.141E-01 3.45E-01 G	
MN-54		4.5649E-04					
			834.81	4.565E-04	%(P	3.712E-02 1.08E-02 G	
CO-57		-2.9839E-04					
			122.07	-2.984E-04	&(P	3.649E-02 1.09E-02 G K	
			136.43	8.752E-02	% P	2.713E-01 8.18E-02 G	
CO-60		2.2544E-03					
			1332.51	2.254E-03	%(P	2.820E-02 7.86E-03 G K	
			1173.23	7.901E-03	% P	4.059E-02 1.19E-02 G K	
Sr-85		-1.8805E-02					
			514.00	-1.880E-02	%(	3.919E-02 1.19E-02 G	
Kr-85		-4.1899E+02					
			513.99	-4.190E+02	%(P	8.191E+02 2.47E+02 G	
Y-88		-4.7931E-03					
			1836.01	-4.793E-03	%(P	2.343E-02 6.39E-03 G K	
			898.02	4.462E-03	% P	3.228E-02 9.36E-03 G	

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
NB-94	-5.2376E-03						
		871.10	-5.238E-03	&(P	3.128E-02	9.17E-03	G K
		702.50	-1.542E-03	& P	2.883E-02	8.36E-03	G K
Ag-108M	1.0979E-04						
		722.95	1.098E-04	&(	3.776E-02	1.10E-02	G K
		614.37	-2.947E-02	+	3.734E-02	1.16E-02	G
		433.93	7.293E-03	% P	2.419E-02	7.20E-03	G
CD-109	1.0647E+00						
		88.04	1.065E+00	(P	1.045E+00	3.22E-01	G
SN-113	1.8556E-03						
		391.71	1.856E-03	%(P	3.920E-02	1.15E-02	G K
		255.04	8.786E-02	%	1.227E+00	3.64E-01	G
SB-125	7.9798E-02						
		427.95	-2.843E-03	%(P	8.476E-02	2.47E-02	G K
		600.77	3.619E-03	& P	1.425E-01	4.13E-02	G
		636.15	5.126E-02	& P	2.191E-01	6.47E-02	G
		463.51	3.244E-01	*(P	2.449E-01	7.89E-02	G
		176.29	8.341E-02	& P	4.195E-01	1.26E-01	G
I-131	-6.6224E-03						
		364.48	-6.622E-03	&(	6.363E-02	1.88E-02	G K
		636.97	1.192E-01	&	8.064E-01	2.36E-01	G
		284.29	-1.077E-01	%	9.212E-01	2.74E-01	G
CS-134	-2.1708E-02						
		604.66	-2.171E-02	%(P	3.667E-02	1.12E-02	G K
		795.76	3.712E-02	+ P	2.962E-02	9.76E-03	G
		569.29	-4.050E-02	%	1.731E-01	5.14E-02	G
		801.84	-6.356E-02	% P	3.189E-01	9.36E-02	G
CS-137	2.1657E-03						
		661.62	2.166E-03	%(P	3.023E-02	8.72E-03	G
CE-139	-4.5444E-03						
		165.85	-4.544E-03	&(P	3.572E-02	1.07E-02	G
EU-152	-4.6922E-03						
		121.78	-4.692E-03	&(P	1.006E-01	3.01E-02	G K
		344.30	-1.736E-02	% P	9.122E-02	2.71E-02	G
		1408.08	3.344E-02	& P	1.155E-01	3.37E-02	G
		964.00	-1.692E-02	& P	3.944E-01	1.16E-01	G
		1112.07	5.722E-02	% P	2.404E-01	7.07E-02	G
		778.90	6.258E-02	% P	1.888E-01	5.62E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
EU-154	1.5249E-03						
		123.10	1.525E-03	%(P	6.562E-02	1.96E-02	G K
		1274.80	-1.702E-02	% P	1.130E-01	3.30E-02	G
		723.30	-5.306E-03	& P	1.432E-01	4.14E-02	G
		1004.80	4.647E-02	& P	1.580E-01	4.68E-02	G
EU-155	1.3179E-01						
		86.45	1.318E-01	(	1.294E-01	3.98E-02	G K
		105.31	1.782E-02	& P	1.457E-01	4.37E-02	G
HG-203	2.2761E-02						
		279.17	2.276E-02	&(P	3.056E-02	9.41E-03	G K
		72.87	-4.801E-01	& P	1.097E+00	3.32E-01	G
		70.83	5.754E-01	%	1.691E+00	5.11E-01	G
		82.50	-6.830E-01	%	2.198E+00	6.64E-01	G
TL-208	2.8856E-01						
		583.14	2.886E-01	*(P	3.098E-02	1.68E-02	G
		510.72	3.468E-01	+ P	1.381E-01	5.74E-02	G
PB-212	7.5392E-01						
		238.63	7.621E-01	(P	4.941E-02	2.45E-02	G K
							Energy duplication
		77.11	7.253E-01	}	1.984E-01	4.97E-02	G
		74.81	9.324E-01	+ P	3.594E-01	1.18E-01	G
PB-214	5.0463E-01						
		351.99	4.647E-01	(P	6.870E-02	3.15E-02	G K
		295.22	5.480E-01	*(P	1.378E-01	5.80E-02	G
							Energy duplication
		77.11	0.000E+00	} P	4.150E-01	0.00E+00	G
		241.92	5.915E-01	(P	3.347E-01	1.08E-01	G
BI-212	7.0129E-01						
		727.17	6.856E-01	@(P	2.761E-01	1.20E-01	G K
		1620.56	7.687E-01	(P	6.224E-01	2.69E-01	G
		785.42	5.878E-01	% P	1.423E+00	4.27E-01	G
BI-214	4.1599E-01						
		609.32	4.046E-01	*(P	7.138E-02	3.51E-02	G K
		1764.51	4.488E-01	*(P	7.661E-02	5.83E-02	G
		1120.28	5.717E-01	+ P	2.805E-01	1.30E-01	G
RA-224	5.1325E-01						
		241.00	5.133E-01	%(P	9.488E-01	2.88E-01	G
RA-226	1.6157E+00						
		185.99	1.616E+00	*(	8.333E-01	3.09E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
AC-228	9.7116E-01						
		911.07	9.712E-01	@(P	1.381E-01	7.75E-02	G K
		968.90	7.460E-01	- P	1.681E-01	7.07E-02	G
		338.40	7.821E-01	- P	1.884E-01	7.60E-02	G
TH-227	-3.2095E-01						
		236.00	-3.209E-01	?(P	3.532E-01	1.08E-01	G K
		256.25	-1.914E-02	& P	3.612E-01	1.07E-01	G
PA-234	4.4544E-02						
		98.44	4.454E-02	%(	1.309E-01	3.95E-02	G K
		946.00	-5.696E-04	&	1.636E-01	4.71E-02	G
		131.28	1.244E-03	&	1.370E-01	4.08E-02	G
		94.67	-1.501E-01	%	2.577E-01	7.84E-02	G
		883.24	2.721E-04	&	2.216E-01	6.32E-02	G
		926.70	2.122E-02	&	2.416E-01	6.96E-02	G
		569.26	-5.943E-02	%	2.546E-01	7.55E-02	G
TH-234	1.2572E+00						
		63.29	1.090E+00	%(P	1.576E+00	4.80E-01	G K
		92.80	1.474E+00	(P	1.280E+00	3.95E-01	G
		92.38	-5.526E-02	% P	1.534E+00	4.58E-01	G
AM-241	-6.7997E-02						
		59.54	-6.800E-02	&(P	2.121E-01	6.40E-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
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	6.2637E-02	7.1033E-02	2.2673E-01	2.2677E-01	2.237E-01
K-40		1.4081E+01	1.4081E+01	1.0337E+00	1.3267E+00	
MN-54	#A	4.4678E-04	4.5649E-04	3.2375E-02	3.2375E-02	3.633E-02
CO-57	#B	-2.9106E-04	-2.9839E-04	4.9602E-02	4.9602E-02	3.559E-02
CO-60	#B	2.2465E-03	2.2544E-03	2.3569E-02	2.3569E-02	2.811E-02
Sr-85	#A	-1.6954E-02	-1.8805E-02	3.5652E-02	3.5669E-02	3.533E-02
Kr-85	#A	-4.1896E+02	-4.1899E+02	8.4547E+02	8.4584E+02	8.191E+02
Y-88	#B	-4.5004E-03	-4.7931E-03	2.7970E-02	2.7971E-02	2.200E-02
NB-94	#B	-5.2376E-03	-5.2376E-03	2.8365E-02	2.8367E-02	3.128E-02
Ag-108M	#B	1.0978E-04	1.0979E-04	3.2992E-02	3.2992E-02	3.775E-02
CD-109	#	1.0490E+00	1.0647E+00	9.6600E-01	9.6780E-01	1.030E+00
SN-113	#B	1.7504E-03	1.8556E-03	3.4459E-02	3.4460E-02	3.697E-02
SB-125	#B	7.9270E-02	7.9798E-02	5.8240E-02	5.8430E-02	8.420E-02
I-131	#B	-2.8721E-03	-6.6224E-03	5.6295E-02	5.6296E-02	2.760E-02
CS-134	#B	-2.1515E-02	-2.1708E-02	3.4328E-02	3.4352E-02	3.635E-02
CS-137	#A	2.1644E-03	2.1657E-03	2.6145E-02	2.6145E-02	3.021E-02
CE-139	#A	-4.3278E-03	-4.5444E-03	3.3274E-02	3.3275E-02	3.402E-02
EU-152	#B	-4.6854E-03	-4.6922E-03	9.3619E-02	9.3620E-02	1.005E-01
EU-154	#B	1.5216E-03	1.5249E-03	5.8657E-02	5.8657E-02	6.548E-02
EU-155	#	1.3131E-01	1.3179E-01	1.1950E-01	1.1972E-01	1.289E-01
HG-203	#A	1.9705E-02	2.2761E-02	2.8231E-02	2.8263E-02	2.646E-02
TL-208	#	2.8856E-01	2.8856E-01	5.0531E-02	5.3327E-02	
PB-212		7.5392E-01	7.5392E-01	7.2634E-02	8.5196E-02	
PB-214		5.0463E-01	5.0463E-01	1.0251E-01	1.0676E-01	
BI-212		7.0129E-01	7.0129E-01	3.6954E-01	3.7186E-01	
BI-214	#	4.1599E-01	4.1599E-01	9.7399E-02	1.0045E-01	
RA-224	#A	5.1325E-01	5.1325E-01	8.6473E-01	8.6526E-01	9.488E-01
RA-226	#	1.6157E+00	1.6157E+00	9.2813E-01	9.3302E-01	
AC-228		9.7116E-01	9.7116E-01	2.3236E-01	2.3933E-01	
TH-227	#A	-3.2095E-01	-3.2095E-01	3.2657E-01	3.2712E-01	3.532E-01
PA-234	#B	4.4544E-02	4.4544E-02	1.1857E-01	1.1860E-01	1.309E-01
TH-234	#B	1.2572E+00	1.2572E+00	9.7138E-01	9.7388E-01	1.576E+00
AM-241	#A	-6.7994E-02	-6.7997E-02	1.9643E-01	1.9646E-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 (1120.2 to 2000.1 keV) 1.9332178E+01 pCi/gm
Total Decayed Activity (1120.2 to 2000.1 keV) 1.9332197E+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_6JULY2006_1122.An1

Sample description
FSS-OOL-10-03-026-F-B

Spectrum Filename: C:\GammaVision\Spectra\107F_6JULY2006_1122.An1

Acquisition information
Start time: 06-Jul-2006 11:22:12
Live time: 2000
Real time: 2003
Dead time: 0.16 %
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: 2.4710E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 2.4710E+03) =
4.0469E+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	22-Jun-2006 15:58:00
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: 0.1934

***** 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	398.	12.80	1.18	2.849E-02	74.81	9.600	7.959E-01	PB212
77.12	445.	9.85	1.18	2.957E-02	77.11	17.500	6.793E-01	PB212
					77.11	10.700	1.103E+00	PB214
77.34	174.	34.22	1.50	2.957E-02	77.11	17.500	PBC<MDA	PB212
					77.11	10.700	PBC<MDA	PB214
87.43	152.	41.03	1.48	3.310E-02	86.45	32.740	7.773E-02	EU155
					88.04	3.790	PBC<MDA	CD109
128.55	180.	30.61	1.15	3.817E-02				
186.40	205.	23.44	1.44	3.607E-02	185.99	3.280	9.486E-01	RA226
209.28	196.	24.96	1.12	3.429E-02				
238.71	1632.	3.28	1.30	3.188E-02	238.63	43.100	6.430E-01	PB212
241.85	217.	18.02	1.30	3.163E-02	241.00	3.900	9.506E-01	RA224
					241.92	7.470	4.993E-01	PB214
270.21	130.	24.83	1.57	2.945E-02				
277.47	132.	30.23	1.40	2.892E-02				
295.37	327.	9.07	1.34	2.768E-02	295.22	19.200	3.322E-01	PB214
300.60	90.	27.92	1.34	2.733E-02				
328.49	134.	25.91	2.27	2.557E-02				
338.49	401.	9.84	1.57	2.500E-02	338.40	12.010	7.244E-01	AC228
352.17	664.	6.24	1.73	2.425E-02	351.99	37.100	4.004E-01	PB214
462.95	104.	28.49	1.70	1.955E-02				
462.95	104.	28.49	1.70	1.955E-02	463.51	10.000	2.861E-01	SB125
511.09	298.	12.59	1.56	1.807E-02	510.72	22.500	3.551E-01	TL208
583.33	583.	7.45	1.73	1.629E-02	583.14	86.000	2.257E-01	TL208
600.75	54.	22.29	1.55	1.584E-02	600.77	18.400	PBC<MDA	SB125
					604.66	97.600	1.922E-02	CS134
609.44	519.	6.23	1.70	1.574E-02	609.32	46.090	3.879E-01	BI214

660.99	46.	41.51	1.39	1.478E-02				
660.99	46.	41.51	1.39	1.478E-02	661.62	84.620	PBC<MDA	CS137
727.60	150.	17.59	1.14	1.374E-02	727.17	11.800	5.029E-01	BI212
771.70	70.	31.89	0.90	1.314E-02				
794.81	121.	17.78	2.01	1.285E-02				
794.81	121.	17.78	2.01	1.285E-02	795.76	85.400	6.086E-02	CS134
911.33	495.	7.76	2.00	1.161E-02	911.07	29.000	7.973E-01	AC228
968.45	378.	8.91	1.64	1.110E-02	968.90	17.460	1.061E+00	AC228
1119.88	115.	24.70	0.99	9.972E-03	1120.28	15.040	4.162E-01	BI214

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
1173.11	40.	36.36	1.93	9.637E-03	1173.23	99.860	PBC<MDA	CO60
1460.99	2341.	2.11	2.19	8.190E-03	1460.75	10.700	1.458E+01	K40
1764.60	124.	8.94	2.35	7.084E-03	1764.51	15.920	6.018E-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	
174.52	87.43	1625.	152.	0.076	123.09	1.479	BI-207	l
256.75	128.55	1164.	209.	0.104	72.37	1.149	AC-228	s
418.21	209.28	843.	196.	0.098	74.87	1.116	AC-228	s
540.05	270.21	398.	130.	0.065	74.49	1.569	AC-228	s
554.56	277.47	518.	132.	0.066	77.85	1.399	TL-208	s
600.41	300.40	352.	116.	0.058	78.90	2.056	PB-212	sM
656.59	328.49	396.	134.	0.067	77.72	2.266	RH-106M	s
1321.56	660.99	124.	46.	0.023	124.54	1.393	CS-137	l
1542.97	771.70	146.	70.	0.035	95.66	0.903	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
HG-203	146.37	73.35	2282.	-193.	-0.096	107.25	1.500s
PB-212	149.29	74.81	1126.	398.	0.199	38.39	1.178D
PB-212	153.89	77.11	1215.	445.	0.223	29.54	1.179A
PB-214	153.89	77.11	2083.	174.	0.087	102.66	1.500A
RA-226	372.44	186.40	881.	205.	0.103	70.33	1.440
TH-227	471.70	236.03	1834.	-201.	-0.101	92.78	1.500s
PB-212	476.89	238.63	557.	1602.	0.801	9.63	1.297D
PB-214	483.47	241.92	673.	201.	0.100	58.35	1.299D
PB-214	589.96	295.17	405.	340.	0.170	31.46	1.610s
AC-228	676.60	338.49	402.	398.	0.199	29.53	1.569s
PB-214	703.95	352.17	355.	659.	0.329	18.71	1.732s
SB-125	925.74	463.07	215.	72.	0.036	89.55	1.500
TL-208	1021.78	511.09	318.	264.	0.132	37.78	1.557s
TL-208	1166.24	583.33	315.	578.	0.289	22.36	1.731
CS-134	1201.07	600.75	46.	54.	0.027	66.86	1.555s
BI-214	1218.47	609.44	169.	515.	0.257	18.70	1.702

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
Ag-108M	1224.50	612.46	263.	-59.	-0.029	123.84	1.561s
BI-212	1454.77	727.60	173.	149.	0.075	52.76	1.139s
CS-134	1589.98	795.21	117.	94.	0.047	57.53	1.684s
AC-228	1822.23	911.33	200.	491.	0.245	23.28	2.003
AC-228	1936.47	968.45	170.	376.	0.188	26.73	1.643s
BI-214	2239.35	1119.89	168.	111.	0.055	71.07	0.990s
CO-60	2345.79	1173.11	113.	40.	0.020	109.09	1.931s
K-40	2921.57	1460.99	30.	2336.	1.168	6.33	2.192
BI-214	3528.85	1764.60	1.	124.	0.062	26.83	2.347s

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		-3.7561E-04					
			477.56	-3.756E-04	&(	2.430E-01 7.10E-02	G
K-40		1.4579E+01					
			1460.75	1.458E+01	(P	1.749E-01 3.08E-01	G
MN-54		1.3395E-02					
			834.81	1.340E-02	%(P	2.515E-02 7.66E-03	G
CO-57		-5.4561E-03					
			122.07	-5.456E-03	%(P	3.242E-02 9.74E-03	G K
			136.43	-3.515E-03	& P	2.582E-01 7.72E-02	G
CO-60		1.6776E-02					
			1332.51	1.046E-02	%(P	2.861E-02 8.47E-03	G K
			1173.23	2.310E-02	(P	2.989E-02 9.26E-03	G K
Sr-85		-1.0855E-02					
			514.00	-1.085E-02	%(	3.280E-02 9.86E-03	G
Kr-85		-2.3742E+02					
			513.99	-2.374E+02	%(P	6.559E+02 1.96E+02	G
Y-88		-2.9583E-03					
			1836.01	-2.958E-03	%(P	1.844E-02 4.95E-03	G K
			898.02	-4.246E-03	& P	3.274E-02 9.54E-03	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
NB-94	4.6063E-03						
		871.10	4.606E-03	&(P	2.070E-02	6.08E-03	G K
		702.50	-6.963E-05	& P	2.584E-02	7.51E-03	G K
Ag-108M	6.2164E-03						
		722.95	6.216E-03	&(	2.285E-02	6.78E-03	G K
		614.37	-2.265E-02	&	3.028E-02	9.35E-03	G
		433.93	-9.169E-04	% P	2.198E-02	6.41E-03	G
CD-109	6.7203E-01						
		88.04	6.720E-01	%(P	9.377E-01	2.86E-01	G
SN-113	1.0036E-02						
		391.71	1.004E-02	%(P	3.365E-02	1.01E-02	G K
		255.04	9.115E-04	%	1.014E+00	3.00E-01	G
SB-125	5.4939E-02						
		427.95	4.758E-03	&(P	6.666E-02	1.96E-02	G K
		600.77	1.503E-02	& P	1.098E-01	3.21E-02	G
		636.15	3.127E-02	% P	1.814E-01	5.33E-02	G
		463.51	2.035E-01	(P	2.007E-01	6.31E-02	G
		176.29	6.391E-02	% P	3.814E-01	1.14E-01	G
I-131	4.6682E-04						
		364.48	4.668E-04	&(	7.791E-02	2.29E-02	G K
		636.97	1.542E-01	&	9.334E-01	2.75E-01	G
		284.29	-1.848E-01	%	1.132E+00	3.38E-01	G
CS-134	1.9224E-02						
		604.66	1.922E-02	?(P	1.234E-02	4.33E-03	G K
		795.76	4.742E-02	+ P	2.685E-02	9.14E-03	G
		569.29	-2.447E-02	%	1.406E-01	4.15E-02	G
		801.84	-2.254E-02	% P	2.830E-01	8.23E-02	G
CS-137	1.5668E-02						
		661.62	1.567E-02	%(P	2.750E-02	8.36E-03	G
CE-139	6.1962E-03						
		165.85	6.196E-03	%(P	2.486E-02	7.46E-03	G
EU-152	-1.2509E-02						
		121.78	-1.251E-02	%(P	9.132E-02	2.74E-02	G K
		344.30	-1.634E-02	% P	7.828E-02	2.33E-02	G
		1408.08	1.274E-02	% P	1.034E-01	2.94E-02	G
		964.00	3.453E-04	% P	1.904E-01	5.50E-02	G
		1112.07	-2.988E-02	% P	2.293E-01	6.70E-02	G
		778.90	2.179E-03	% P	2.159E-01	6.29E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
EU-154	-2.8877E-04						
		123.10	-2.888E-04	%(P	5.912E-02	1.76E-02	G K
		1274.80	-1.434E-02	% P	9.785E-02	2.87E-02	G
		723.30	-8.657E-02	% P	1.710E-01	5.19E-02	G
		1004.80	1.890E-03	& P	1.495E-01	4.30E-02	G
EU-155	7.3634E-02						
		86.45	7.363E-02	%(	1.146E-01	3.49E-02	G K
		105.31	1.669E-02	% P	1.047E-01	3.14E-02	G
HG-203	-4.0912E-04						
		279.17	-4.091E-04	&(P	3.286E-02	9.73E-03	G K
		72.87	-4.839E-01	& P	1.024E+00	3.10E-01	G
		70.83	-1.402E+00	+	1.638E+00	5.01E-01	G
		82.50	-7.718E-01	%	1.936E+00	5.86E-01	G
TL-208	2.2566E-01						
		583.14	2.257E-01	(P	3.334E-02	1.70E-02	G
		510.72	3.551E-01	+ P	1.153E-01	5.04E-02	G
PB-212	6.4954E-01						
		238.63	6.375E-01	(P	4.482E-02	2.07E-02	G K
							Energy duplication
		77.11	4.705E-01	}	1.745E-01	4.63E-02	G
		74.81	7.959E-01	+ P	3.180E-01	1.03E-01	G
PB-214	3.8320E-01						
		351.99	4.004E-01	*(P	5.501E-02	2.52E-02	G K
		295.22	3.500E-01	(P	9.930E-02	3.72E-02	G
							Energy duplication
		77.11	3.006E-01	} P	3.722E-01	1.03E-01	G
		241.92	4.645E-01	+ P	2.861E-01	9.10E-02	G
BI-212	5.0287E-01						
		727.17	5.029E-01	*(P	2.158E-01	8.92E-02	G K
		1620.56	2.269E-01	& P	7.408E-01	2.17E-01	G
		785.42	5.628E-01	& P	1.089E+00	3.31E-01	G
BI-214	3.9175E-01						
		609.32	3.879E-01	(P	4.775E-02	2.44E-02	G K
		1764.51	6.018E-01	+ P	3.574E-02	5.42E-02	G
		1120.28	4.034E-01	(P	2.304E-01	9.63E-02	G
RA-224	2.6204E-01						
		241.00	2.620E-01	%(P	8.199E-01	2.47E-01	G
RA-226	9.4864E-01						
		185.99	9.486E-01	(	6.512E-01	2.22E-01	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments

AC-228       7.7596E-01
                          911.07 7.973E-01  (P 1.115E-01 6.24E-02 G K
                          968.90 1.061E+00 + P 1.793E-01 9.51E-02 G
                          338.40 7.244E-01 *(P 1.751E-01 7.19E-02 G

TH-227      -3.0627E-01
                          236.00-3.063E-01 ?(P 3.076E-01 9.46E-02 G K
                          256.25 4.161E-02 % P 3.188E-01 9.51E-02 G

PA-234      -1.0319E-02
                           98.44-1.032E-02 %(  1.223E-01 3.67E-02 G K
                          946.00 2.787E-02 &   1.046E-01 3.09E-02 G
                          131.28-3.935E-02 &   1.400E-01 4.22E-02 G
                           94.67-8.017E-02 %   2.134E-01 6.46E-02 G
                          883.24 2.472E-03 &   1.540E-01 4.37E-02 G
                          926.70 8.095E-02 %   1.780E-01 5.38E-02 G
                          569.26-2.633E-02 %   2.111E-01 6.21E-02 G

TH-234       2.4396E-01
                           63.29 2.440E-01 %(P 1.438E+00 4.32E-01 G K
                           92.80 6.975E-01 % P 1.140E+00 3.46E-01 G
                           92.38-7.919E-02 % P 1.217E+00 3.64E-01 G

AM-241       2.2883E-02
                           59.54 2.288E-02 %(P 1.830E-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
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	-3.1398E-04	-3.7561E-04	2.1306E-01	2.1306E-01	2.031E-01
K-40		1.4579E+01	1.4579E+01	9.2523E-01	1.2639E+00	
MN-54	#A	1.2991E-02	1.3395E-02	2.2983E-02	2.2996E-02	2.439E-02
CO-57	#B	-5.2661E-03	-5.4561E-03	2.9749E-02	2.9751E-02	3.129E-02
CO-60	#B	1.6693E-02	1.6776E-02	2.0184E-02	2.0208E-02	2.847E-02
Sr-85	#A	-9.3652E-03	-1.0855E-02	2.9580E-02	2.9587E-02	2.830E-02
Kr-85	#A	-2.3740E+02	-2.3742E+02	7.0447E+02	7.0461E+02	6.559E+02
Y-88	#B	-2.7043E-03	-2.9583E-03	2.4273E-02	2.4274E-02	1.685E-02
NB-94	#B	4.6063E-03	4.6063E-03	1.8243E-02	1.8245E-02	2.070E-02
Ag-108M	#B	6.2151E-03	6.2164E-03	2.0337E-02	2.0340E-02	2.285E-02
CD-109	#A	6.5799E-01	6.7203E-01	8.5846E-01	8.5927E-01	9.181E-01
SN-113	#B	9.2354E-03	1.0036E-02	3.0194E-02	3.0200E-02	3.097E-02
SB-125	#B	5.4422E-02	5.4939E-02	5.1124E-02	5.1227E-02	6.603E-02
I-131	#B	1.4195E-04	4.6682E-04	6.8646E-02	6.8646E-02	2.369E-02
CS-134	#	1.8982E-02	1.9224E-02	1.2979E-02	1.3028E-02	1.218E-02
CS-137	#A	1.5655E-02	1.5668E-02	2.5093E-02	2.5110E-02	2.748E-02
CE-139	#A	5.7795E-03	6.1962E-03	2.2395E-02	2.2398E-02	2.319E-02
EU-152	#B	-1.2484E-02	-1.2509E-02	8.3159E-02	8.3162E-02	9.113E-02
EU-154	#B	-2.8788E-04	-2.8877E-04	2.6630E-01	2.6630E-01	5.893E-02
EU-155	#B	7.3246E-02	7.3634E-02	1.0470E-01	1.0477E-01	1.140E-01
HG-203	#B	-3.3314E-04	-4.0912E-04	5.9130E-01	5.9130E-01	2.676E-02
TL-208		2.2566E-01	2.2566E-01	5.0863E-02	5.2580E-02	
PB-212		6.4954E-01	6.4954E-01	6.3189E-02	7.3922E-02	
PB-214		3.8320E-01	3.8320E-01	7.0953E-02	7.4475E-02	
BI-212	#	5.0287E-01	5.0287E-01	2.6758E-01	2.6923E-01	
BI-214		3.9175E-01	3.9175E-01	7.3888E-02	7.7426E-02	
RA-224	#A	2.6204E-01	2.6204E-01	7.4235E-01	7.4251E-01	8.199E-01
RA-226		9.4863E-01	9.4864E-01	6.6720E-01	6.6955E-01	
AC-228		7.7596E-01	7.7596E-01	1.4709E-01	1.5407E-01	
TH-227	#A	-3.0627E-01	-3.0627E-01	2.8453E-01	2.8511E-01	3.076E-01
PA-234	#B	-1.0319E-02	-1.0319E-02	1.1011E-01	1.1011E-01	1.223E-01
TH-234	#B	2.4396E-01	2.4396E-01	1.2955E+00	1.2955E+00	1.438E+00
AM-241	#A	2.2881E-02	2.2883E-02	1.6489E-01	1.6489E-01	1.830E-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) 1.8456917E+01 pCi/gm
Total Decayed Activity (270.2 to 2000.1 keV) 1.8456932E+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_27JUN2006_2015.An1

Sample description
FSS-OOL-10-03-002-F-S WET

Spectrum Filename: C:\GammaVision\Spectra\107F_27JUN2006_2015.An1

Acquisition information
Start time: 27-Jun-2006 20:15:10
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: 2.3220E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 2.3220E+03) =
4.3066E+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	26-Jun-2006 16:27:00
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. 25 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.1906

***** 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	408.	12.18	1.18	2.849E-02	74.81	9.600	8.690E-01	PB212
77.12	420.	10.50	1.18	2.957E-02	77.11	17.500	7.241E-01	PB212
					77.11	10.700	1.175E+00	PB214
77.13	214.	27.32	1.50	2.957E-02	77.11	17.500	PBC<MDA	PB212
					77.11	10.700	PBC<MDA	PB214
86.77	214.	21.29	1.19	3.292E-02	86.45	32.740	1.159E-01	EU155
90.02	172.	25.02	1.19	3.375E-02				
93.66	255.	17.67	1.19	3.456E-02	92.38	2.570	1.630E+00	TH234
					92.80	3.000	1.326E+00	TH234
					98.44	25.100	1.666E-01	PA234
129.14	162.	36.40	0.96	3.818E-02				
186.30	229.	22.26	1.63	3.608E-02	185.99	3.280	1.125E+00	RA226
209.67	204.	24.51	1.27	3.425E-02				
238.78	1575.	3.26	1.30	3.188E-02	238.63	43.100	6.601E-01	PB212
241.52	267.	18.44	1.30	3.166E-02	241.00	3.900	1.245E+00	RA224
					241.92	7.470	6.535E-01	PB214
270.68	148.	28.95	1.25	2.941E-02				
295.42	371.	8.24	1.34	2.766E-02	295.22	19.200	4.009E-01	PB214
300.44	113.	21.62	1.34	2.733E-02				
327.99	104.	30.89	1.34	2.560E-02				
338.67	385.	9.18	1.50	2.499E-02	338.40	12.010	7.403E-01	AC228
352.11	715.	5.33	1.59	2.425E-02	351.99	37.100	4.592E-01	PB214
462.92	158.	21.34	1.28	1.955E-02				
462.92	158.	21.34	1.28	1.955E-02	463.51	10.000	4.629E-01	SB125
473.36	39.	40.46	1.52	1.920E-02				
510.87	249.	11.17	1.72	1.808E-02	510.72	22.500	3.078E-01	TL208
583.35	594.	6.94	1.81	1.629E-02	583.14	86.000	2.450E-01	TL208

609.59	482.	5.92	1.80	1.574E-02	609.32	46.090	3.836E-01	BI214
727.97	174.	15.02	2.16	1.373E-02	727.17	11.800	6.195E-01	BI212
768.11	85.	33.93	1.22	1.319E-02				
795.50	83.	24.64	1.97	1.284E-02				
795.50	83.	24.64	1.97	1.284E-02	795.76	85.400	4.387E-02	CS134
911.40	413.	6.40	1.77	1.160E-02	911.07	29.000	7.070E-01	AC228
964.88	80.	18.82	1.80	1.113E-02				
969.42	278.	7.43	1.80	1.109E-02	968.90	17.460	8.283E-01	AC228
1120.48	180.	14.07	1.85	9.969E-03	1120.28	15.040	6.936E-01	BI214
1461.26	2218.	2.23	2.24	8.189E-03	1460.75	10.700	1.470E+01	K40

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
1621.13	18.	41.22	2.21	7.569E-03	1620.56	2.750	PBC<MDA	BI212
1765.06	115.	9.68	2.19	7.082E-03	1764.51	15.920	5.909E-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	
179.71	89.98	837.	172.	0.086	75.07	1.189	PB-214	lD
418.97	209.67	885.	204.	0.102	73.53	1.265	NP-239	s
540.99	270.68	603.	148.	0.074	86.86	1.247	AC-228	s
600.43	300.40	323.	92.	0.046	92.17	1.825	PB-212	sM
655.60	327.99	368.	104.	0.052	92.67	1.342	AC-228	
946.31	473.36	105.	39.	0.020	121.38	1.521	RH-106M	
1535.79	768.11	206.	84.	0.042	79.79	1.225	BI-214	s
1930.11	964.78	68.	84.	0.042	53.19	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	1059.	408.	0.204	36.54	1.178D
PB-212	153.89	77.11	1165.	420.	0.210	31.51	1.179A
PB-214	153.89	77.11	1968.	214.	0.107	81.97	1.500A
EU-155	173.97	87.15	2136.	203.	0.102	98.63	1.500s
TH-234	186.28	93.31	1911.	245.	0.122	75.59	1.500s
TH-234	186.30	93.32	1974.	242.	0.121	74.14	1.500s
RA-226	372.25	186.30	948.	229.	0.115	66.79	1.632s
PB-212	476.89	238.63	471.	1558.	0.779	9.50	1.297D
PB-214	483.47	241.92	745.	184.	0.092	47.31	1.299A
PB-214	590.39	295.38	518.	363.	0.181	33.69	1.577
AC-228	676.95	338.67	336.	382.	0.191	27.54	1.495s
PB-214	703.83	352.11	290.	710.	0.355	16.00	1.588s
SB-125	926.04	463.22	225.	104.	0.052	65.87	1.500s
TL-208	1021.33	510.87	221.	215.	0.108	33.52	1.718s
TL-208	1166.28	583.35	274.	590.	0.295	20.81	1.811
BI-214	1218.77	609.59	138.	478.	0.239	17.76	1.798
Ag-108M	1223.73	612.07	330.	-90.	-0.045	91.25	1.561s
BI-212	1455.52	727.97	155.	173.	0.086	45.07	2.158s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
CS-134	1590.54	795.49	109.	66.	0.033	75.42	1.684
AC-228	1822.36	911.40	103.	409.	0.204	19.21	1.765
AC-228	1937.36	968.90	90.	276.	0.138	23.00	1.799D
BI-214	2240.52	1120.48	128.	179.	0.089	42.20	1.853s
K-40	2922.12	1461.26	49.	2213.	1.107	6.68	2.238
BI-214	3529.77	1765.06	3.	115.	0.057	29.04	2.193s

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		1.1046E-02					
			477.56	1.105E-02	&(	1.806E-01 5.26E-02	G
K-40		1.4697E+01					
			1460.75	1.470E+01	(P	2.340E-01 3.28E-01	G
MN-54		4.5640E-03					
			834.81	4.564E-03	&(P	2.968E-02 8.74E-03	G
CO-57		-3.6069E-04					
			122.07	-3.607E-04	%(P	3.213E-02 9.60E-03	G K
			136.43	1.050E-02	% P	2.591E-01 7.76E-02	G
CO-60		2.3403E-04					
			1332.51	2.340E-04	&(P	2.847E-02 8.00E-03	G K
			1173.23	2.436E-03	% P	3.669E-02 1.06E-02	G K
Sr-85		-1.3438E-02					
			514.00	-1.344E-02	%(	3.067E-02 9.28E-03	G
Kr-85		-3.2885E+02					
			513.99	-3.289E+02	%(P	7.019E+02 2.12E+02	G
Y-88		-2.8687E-03					
			1836.01	-2.869E-03	%(P	2.209E-02 6.05E-03	G K
			898.02	2.222E-03	& P	3.109E-02 9.04E-03	G
NB-94		8.7987E-03					
			871.10	8.799E-03	&(P	1.864E-02 5.65E-03	G K
			702.50	-2.077E-04	% P	2.617E-02 7.59E-03	G K

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
Ag-108M	-1.9325E-02						
		722.95	-1.933E-02	%(	3.762E-02	1.14E-02	G K
		614.37	-3.704E-02	+	3.594E-02	1.13E-02	G
		433.93	-5.288E-03	& P	2.407E-02	7.13E-03	G
CD-109	1.0681E-01						
		88.04	1.068E-01	%(P	1.054E+00	3.17E-01	G
SN-113	2.5288E-03						
		391.71	2.529E-03	&(P	3.418E-02	1.01E-02	G K
		255.04	2.053E-01	&	1.097E+00	3.28E-01	G
SB-125	7.7429E-02						
		427.95	-1.327E-03	%(P	7.271E-02	2.12E-02	G K
		600.77	-2.208E-02	& P	1.209E-01	3.55E-02	G
		636.15	2.364E-02	% P	1.841E-01	5.37E-02	G
		463.51	3.105E-01	*(P	2.166E-01	7.00E-02	G
		176.29	-3.594E-02	& P	3.860E-01	1.15E-01	G
I-131	-1.1052E-04						
		364.48	-1.105E-04	%(	2.800E-02	8.22E-03	G K
		636.97	0.000E+00	%	3.511E-01	1.02E-01	G
		284.29	4.932E-02	%	4.110E-01	1.22E-01	G
CS-134	1.6159E-02						
		604.66	-6.133E-04	&(P	5.172E-02	1.54E-02	G K
		795.76	3.533E-02	(P	2.728E-02	8.95E-03	G
		569.29	8.695E-04	%	1.443E-01	4.20E-02	G
		801.84	5.602E-02	& P	2.708E-01	7.97E-02	G
CS-137	5.2669E-03						
		661.62	5.267E-03	&(P	3.168E-02	9.32E-03	G
CE-139	-2.4109E-03						
		165.85	-2.411E-03	%(P	3.051E-02	9.12E-03	G
EU-152	2.5008E-02						
		121.78	2.501E-02	%(P	8.939E-02	2.69E-02	G K
		344.30	-1.821E-03	% P	8.293E-02	2.44E-02	G
		1408.08	4.336E-02	% P	9.961E-02	2.99E-02	G
		964.00	-9.294E-02	% P	2.500E-01	7.52E-02	G
		1112.07	4.504E-02	& P	2.290E-01	6.74E-02	G
		778.90	9.009E-03	% P	1.563E-01	4.49E-02	G
EU-154	-5.4769E-06						
		123.10	-5.477E-06	%(P	6.134E-02	1.83E-02	G K
		1274.80	-5.877E-04	% P	7.884E-02	2.24E-02	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          723.30-1.005E-01 % P 1.841E-01 5.60E-02 G
                         1004.80 1.927E-02 % P 1.546E-01 4.51E-02 G

EU-155       1.1020E-01
                           86.45 1.102E-01  (  1.181E-01 3.62E-02 G K
                          105.31 4.182E-02 & P 1.381E-01 4.17E-02 G

HG-203      -4.8576E-03
                          279.17-4.858E-03 %(P 3.053E-02 9.11E-03 G K
                           72.87-2.741E-01 & P 8.756E-01 2.65E-01 G
                           70.83-1.009E+00 %   1.436E+00 4.38E-01 G
                           82.50-2.006E-01 %   1.662E+00 4.99E-01 G

TL-208       2.4500E-01
                          583.14 2.450E-01  (P 3.318E-02 1.71E-02 G
                          510.72 3.078E-01 + P 1.029E-01 3.98E-02 G

PB-212       6.7827E-01
                          238.63 6.597E-01  (P 4.395E-02 2.11E-02 G K
                                                          Energy duplication
                           77.11 4.722E-01 }   1.819E-01 4.96E-02 G
                           74.81 8.690E-01 + P 3.283E-01 1.07E-01 G

PB-214       4.5416E-01
                          351.99 4.592E-01 *(P 5.306E-02 2.47E-02 G K
                          295.22 3.974E-01 - P 1.191E-01 4.52E-02 G
                                                          Energy duplication
                           77.11 3.927E-01 } P 3.852E-01 1.07E-01 G
                          241.92 4.542E-01 } P 3.199E-01 7.16E-02 G

BI-212       6.1947E-01
                          727.17 6.195E-01 *(P 2.182E-01 9.38E-02 G K
                         1620.56 5.119E-01 & P 6.751E-01 2.17E-01 G
                          785.42 2.697E-01 % P 1.264E+00 3.73E-01 G

BI-214       3.8355E-01
                          609.32 3.836E-01  (P 4.606E-02 2.29E-02 G K
                         1764.51 5.909E-01 + P 5.895E-02 5.77E-02 G
                         1120.28 6.936E-01 + P 2.154E-01 9.81E-02 G

RA-224       6.1205E-01
                                                          Derived Ave Activity
                          241.00 6.120E-01 }(P 9.286E-01 2.93E-01 G

RA-226       1.1255E+00
                          185.99 1.125E+00 *(  7.185E-01 2.51E-01 G

AC-228       7.5011E-01
                          911.07 7.070E-01  (P 8.646E-02 4.57E-02 G K
                          968.90 8.284E-01  (P 1.412E-01 6.40E-02 G
```

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          338.40 7.403E-01  (P 1.708E-01 6.86E-02 G

TH-227      -2.1471E-01
                          236.00-2.147E-01 %(P 2.976E-01 9.09E-02 G K
                          256.25-7.878E-02 % P 3.566E-01 1.07E-01 G

PA-234       2.0006E-03
                           98.44 2.001E-03 %(  9.381E-02 2.80E-02 G K
                          946.00-2.360E-02 %   1.579E-01 4.64E-02 G
                          131.28-2.398E-03 &   1.458E-01 4.36E-02 G
                           94.67-1.199E-01 %   2.221E-01 6.75E-02 G
                          883.24 7.967E-02 %   1.928E-01 5.80E-02 G
                          926.70 3.684E-02 &   2.310E-01 6.76E-02 G
                          569.26 1.154E-03 %   1.881E-01 5.44E-02 G

TH-234       9.9651E-01
                           63.29 3.057E-01 %(P 1.439E+00 4.32E-01 G K
                           92.80 1.363E+00 *(P 1.183E+00 3.64E-01 G
                           92.38 1.617E+00 &(P 1.363E+00 4.21E-01 G

AM-241       1.0053E-02
                           59.54 1.005E-02 &(P 1.887E-01 5.65E-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
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	1.0881E-02	1.1046E-02	1.5791E-01	1.5791E-01	1.779E-01
K-40		1.4697E+01	1.4697E+01	9.8362E-01	1.3118E+00	
MN-54	#A	4.5523E-03	4.5640E-03	2.6215E-02	2.6217E-02	2.960E-02
CO-57	#B	-3.5962E-04	-3.6069E-04	3.7995E-02	3.7995E-02	3.203E-02
CO-60	#B	2.3393E-04	2.3403E-04	2.4001E-02	2.4001E-02	2.846E-02
Sr-85	#A	-1.3273E-02	-1.3438E-02	2.7832E-02	2.7844E-02	3.029E-02
Kr-85	#A	-3.2885E+02	-3.2885E+02	7.2786E+02	7.2812E+02	7.019E+02
Y-88	#B	-2.8472E-03	-2.8687E-03	2.9855E-02	2.9856E-02	2.192E-02
NB-94	#B	8.7987E-03	8.7987E-03	1.6940E-02	1.6948E-02	1.864E-02
Ag-108M	#B	-1.9325E-02	-1.9325E-02	3.4301E-02	3.4320E-02	3.762E-02
CD-109	#A	1.0662E-01	1.0681E-01	9.5040E-01	9.5042E-01	1.052E+00
SN-113	#B	2.5112E-03	2.5288E-03	3.0219E-02	3.0220E-02	3.394E-02
SB-125	#F	7.7368E-02	7.7429E-02	5.2384E-02	5.2583E-02	7.265E-02
I-131	#B	-1.0001E-04	-1.1052E-04	2.4671E-02	2.4671E-02	2.534E-02
CS-134	#B	1.6142E-02	1.6159E-02	1.2284E-02	1.2321E-02	5.166E-02
CS-137	#A	5.2665E-03	5.2669E-03	2.7966E-02	2.7968E-02	3.168E-02
CE-139	#A	-2.3969E-03	-2.4109E-03	2.8921E-02	2.8921E-02	3.033E-02
EU-152	#B	2.5003E-02	2.5008E-02	8.0823E-02	8.0835E-02	8.938E-02
EU-154	#B	-5.4755E-06	-5.4769E-06	5.7925E-02	5.7925E-02	6.133E-02
EU-155	#A	1.1015E-01	1.1020E-01	1.0869E-01	1.0887E-01	1.181E-01
HG-203	#B	-4.7746E-03	-4.8576E-03	3.1275E-02	3.1276E-02	3.001E-02
TL-208		2.4500E-01	2.4500E-01	5.1386E-02	5.3384E-02	
PB-212		6.7827E-01	6.7827E-01	6.5085E-02	7.6426E-02	
PB-214		4.5416E-01	4.5416E-01	7.3206E-02	7.7966E-02	
BI-212	#	6.1947E-01	6.1947E-01	2.8126E-01	2.8362E-01	
BI-214		3.8355E-01	3.8355E-01	6.8750E-02	7.2386E-02	
RA-224	A	6.1205E-01	6.1205E-01	8.5393E-01	8.5470E-01	
RA-226	#	1.1255E+00	1.1255E+00	7.5167E-01	7.5461E-01	
AC-228		7.5011E-01	7.5011E-01	1.0265E-01	1.1181E-01	
TH-227	#B	-2.1471E-01	-2.1471E-01	2.7383E-01	2.7413E-01	2.976E-01
PA-234	#B	2.0006E-03	2.0006E-03	8.3862E-02	8.3862E-02	9.381E-02
TH-234	#B	9.9651E-01	9.9651E-01	7.7782E-01	7.7978E-01	1.439E+00
AM-241	#A	1.0052E-02	1.0053E-02	1.6959E-01	1.6959E-01	1.887E-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 (1120.2 to 2000.1 keV) 1.9564877E+01 pCi/gm
Total Decayed Activity (1120.2 to 2000.1 keV) 1.9564878E+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_28JUN2006_1930.An1

Sample description
FSS-OOL-10-03-031-F-B

Spectrum Filename: C:\GammaVision\Spectra\107F_28JUN2006_1930.An1

Acquisition information
Start time: 28-Jun-2006 19:30:14
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: 2.1010E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 2.1010E+03) =
4.7596E+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_28JUN2006_1930.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	26-Jun-2006 16:21:00
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. 20 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.1352

***** 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	308.	14.90	1.18	2.842E-02	74.81	9.600	7.157E-01	PB212
77.26	553.	8.34	1.18	2.976E-02	77.11	17.500	6.874E-01	PB212
					77.11	10.700	1.115E+00	PB214
87.08	208.	20.17	1.19	3.306E-02	86.45	32.740	1.244E-01	EU155
					88.04	3.790	PBC<MDA	CD109
90.00	147.	27.81	1.19	3.379E-02				
93.11	253.	16.55	1.19	3.448E-02	92.38	2.570	1.785E+00	TH234
					92.80	3.000	1.452E+00	TH234
129.59	112.	33.84	1.50	3.819E-02				
186.19	160.	28.70	1.33	3.609E-02	185.99	3.280	8.691E-01	RA226
209.75	137.	29.53	1.14	3.425E-02				
238.76	1395.	3.53	1.30	3.188E-02	238.63	43.100	6.456E-01	PB212
241.72	232.	16.19	1.30	3.164E-02	241.00	3.900	1.194E+00	RA224
					241.92	7.470	6.269E-01	PB214
270.36	90.	28.67	1.05	2.944E-02				
277.24	136.	27.13	1.27	2.893E-02				
295.36	344.	8.33	1.34	2.768E-02	295.22	19.200	4.108E-01	PB214
300.47	75.	31.08	1.34	2.734E-02				
328.35	110.	26.03	1.05	2.558E-02				
338.46	340.	12.11	1.52	2.500E-02	338.40	12.010	7.205E-01	AC228
352.03	614.	7.05	1.54	2.426E-02	351.99	37.100	4.349E-01	PB214
463.05	124.	18.81	1.90	1.954E-02				
463.05	124.	18.81	1.90	1.954E-02	463.51	10.000	4.014E-01	SB125
511.27	212.	16.55	1.82	1.807E-02	510.72	22.500	2.828E-01	TL208
583.32	554.	7.35	1.93	1.629E-02	583.14	86.000	2.521E-01	TL208
609.55	444.	7.96	1.74	1.574E-02	609.32	46.090	3.898E-01	BI214
727.37	127.	16.94	2.02	1.374E-02	727.17	11.800	4.982E-01	BI212

768.52	73.	30.22	1.62	1.318E-02				
795.31	58.	23.77	1.80	1.284E-02				
795.31	58.	23.77	1.80	1.284E-02	795.76	85.400	3.378E-02	CS134
861.41	116.	20.29	0.95	1.210E-02				
911.42	372.	7.86	1.74	1.160E-02	911.07	29.000	7.017E-01	AC228
964.76	71.	21.38	1.80	1.113E-02				
969.40	234.	8.50	1.80	1.109E-02	968.90	17.460	7.711E-01	AC228
1121.08	104.	22.26	1.61	9.965E-03	1120.28	15.040	4.423E-01	BI214
1461.24	2173.	2.20	2.09	8.189E-03	1460.75	10.700	1.591E+01	K40
1620.76	30.	21.16	0.81	7.569E-03	1620.56	2.750	9.177E-01	BI212
1765.23	98.	11.81	2.01	7.081E-03	1764.51	15.920	5.538E-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	
173.82	87.24	774.	208.	0.104	60.50	1.187	PB-214	D
179.67	90.17	760.	147.	0.073	83.42	1.189	PB-214	D
185.88	93.27	747.	253.	0.126	49.66	1.191	U-235	D
419.14	209.75	629.	137.	0.069	88.58	1.142	NP-239	
540.35	270.36	288.	90.	0.045	86.02	1.050	AC-228	
554.10	277.24	431.	155.	0.077	61.76	1.269	TL-208	s
600.25	300.31	277.	85.	0.042	91.36	1.106	PB-212	M
656.31	328.35	297.	110.	0.055	78.08	1.055	RH-106M	s
1536.61	768.52	132.	73.	0.036	75.79	1.620	BI-214	sM
1722.39	861.41	114.	121.	0.061	46.30	0.952	TL-208	s
1929.97	964.73	85.	64.	0.032	72.17	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	868.	341.	0.170	39.63	1.178D
PB-212	153.89	77.11	900.	363.	0.182	32.91	1.179A
PB-214	153.89	77.11	1590.	183.	0.091	85.96	1.500A
EU-155	174.04	87.19	1895.	169.	0.084	111.90	1.500
TH-234	185.73	93.04	1762.	228.	0.114	77.85	1.500s
TH-234	185.71	93.02	1704.	218.	0.109	75.77	1.500s
RA-226	372.02	186.19	812.	160.	0.080	86.10	1.333
TH-227	471.50	235.93	1532.	-146.	-0.073	116.90	1.500s
PB-212	476.89	238.63	454.	1380.	0.690	10.24	1.297D
PB-214	483.47	241.92	610.	210.	0.105	53.74	1.299D
PB-214	590.02	295.20	430.	369.	0.185	31.29	1.461
AC-228	676.54	338.46	426.	336.	0.168	36.33	1.518
PB-214	703.68	352.03	410.	609.	0.304	21.14	1.542
SB-125	926.03	463.22	218.	89.	0.044	74.86	1.500s
TL-208	1022.13	511.27	326.	179.	0.089	49.64	1.822s
TL-208	1166.23	583.32	267.	549.	0.275	22.05	1.926s
BI-214	1218.67	609.55	234.	440.	0.220	23.88	1.744
Ag-108M	1223.03	611.72	354.	-119.	-0.059	72.65	1.561s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
BI-212	1454.31	727.37	125.	126.	0.063	50.81	2.022s
CS-134	1590.45	795.44	114.	59.	0.030	84.98	1.684
AC-228	1822.40	911.42	142.	367.	0.184	23.58	1.737
AC-228	1937.36	968.90	91.	232.	0.116	25.98	1.799D
BI-214	2241.73	1121.08	145.	103.	0.052	66.78	1.615s
K-40	2922.08	1461.24	32.	2168.	1.084	6.59	2.091
BI-212	3241.15	1620.76	3.	30.	0.015	63.48	0.814s
BI-214	3530.11	1765.23	10.	97.	0.049	35.44	2.010

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		3.4434E-02					
			477.56	3.443E-02	&(	2.250E-01 6.64E-02 G	
K-40		1.5912E+01					
			1460.75	1.591E+01	(P	2.125E-01 3.51E-01 G	
MN-54		-1.0990E-02					
			834.81	-1.099E-02	&(P	3.031E-02 9.07E-03 G	
CO-57		1.0142E-02					
			122.07	1.014E-02	&(P	3.201E-02 9.66E-03 G K	
			136.43	-2.132E-02	% P	2.738E-01 8.20E-02 G	
CO-60		-1.9034E-03					
			1332.51	-1.903E-03	%(P	3.243E-02 9.05E-03 G K	
			1173.23	1.380E-02	% P	3.855E-02 1.15E-02 G K	
Sr-85		-1.4097E-02					
			514.00	-1.410E-02	&(	3.328E-02 1.01E-02 G	
Kr-85		-3.5346E+02					
			513.99	-3.535E+02	&(P	7.589E+02 2.29E+02 G	
Y-88		-1.6903E-03					
			1836.01	-1.690E-03	&(P	2.184E-02 5.79E-03 G K	
			898.02	-5.282E-03	% P	3.319E-02 9.66E-03 G	
NB-94		-1.1302E-02					
			871.10	-1.130E-02	%(P	2.746E-02 8.26E-03 G K	
			702.50	-3.723E-04	% P	2.808E-02 8.14E-03 G K	

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
Ag-108M	-1.3112E-02						
		722.95	-1.311E-02	&(	3.646E-02	1.10E-02	G K
		614.37	-5.401E-02	&	4.112E-02	1.31E-02	G
		433.93	-8.113E-04	% P	2.451E-02	7.13E-03	G
CD-109	-5.6120E-02						
		88.04	-5.612E-02	%(P	1.114E+00	3.34E-01	G
SN-113	-6.1916E-03						
		391.71	-6.192E-03	%(P	3.774E-02	1.12E-02	G K
		255.04	2.919E-01	&	1.046E+00	3.14E-01	G
SB-125	8.3858E-02						
		427.95	1.335E-02	%(P	7.185E-02	2.12E-02	G K
		600.77	1.121E-02	& P	1.369E-01	3.99E-02	G
		636.15	6.101E-02	% P	2.007E-01	5.97E-02	G
		463.51	2.926E-01	*(P	2.358E-01	7.53E-02	G
		176.29	-1.897E-02	% P	3.935E-01	1.17E-01	G
I-131	-3.6436E-03						
		364.48	-3.644E-03	%(	3.159E-02	9.34E-03	G K
		636.97	1.169E-01	%	3.520E-01	1.05E-01	G
		284.29	-4.681E-03	&	4.594E-01	1.36E-01	G
CS-134	1.6136E-02						
		604.66	-2.184E-04	&(P	5.680E-02	1.69E-02	G K
		795.76	3.483E-02	(P	3.084E-02	9.95E-03	G
		569.29	-4.878E-03	&	1.692E-01	4.94E-02	G
		801.84	-1.800E-02	% P	2.798E-01	8.06E-02	G
CS-137	-9.5508E-03						
		661.62	-9.551E-03	%(P	3.170E-02	9.31E-03	G
CE-139	5.3068E-03						
		165.85	5.307E-03	%(P	3.195E-02	9.58E-03	G
EU-152	5.8818E-03						
		121.78	5.882E-03	%(P	8.163E-02	2.44E-02	G K
		344.30	2.331E-03	& P	9.021E-02	2.66E-02	G
		1408.08	2.740E-02	% P	1.187E-01	3.44E-02	G
		964.00	-7.392E-02	& P	2.658E-01	7.92E-02	G
		1112.07	4.435E-02	& P	2.498E-01	7.33E-02	G
		778.90	-3.171E-03	% P	1.960E-01	5.63E-02	G
EU-154	-5.9329E-03						
		123.10	-5.933E-03	&(P	7.483E-02	2.24E-02	G K
		1274.80	3.104E-03	% P	8.827E-02	2.52E-02	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          723.30-6.320E-02 & P 1.662E-01 4.99E-02 G
                         1004.80-4.407E-03 & P 1.877E-01 5.42E-02 G

EU-155       1.0100E-01
                           86.45 1.010E-01  (  1.231E-01 3.77E-02 G K
                          105.31 4.798E-02 % P 1.358E-01 4.10E-02 G

HG-203      -1.2597E-02
                          279.17-1.260E-02 %(P 3.032E-02 9.15E-03 G K
                           72.87-1.609E-01 % P 8.939E-01 2.69E-01 G
                           70.83 3.752E-02 %   1.486E+00 4.45E-01 G
                           82.50-5.520E-01 %   1.870E+00 5.64E-01 G

TL-208       2.5844E-01
                          583.14 2.521E-01 @(P 3.620E-02 1.87E-02 G
                          510.72 2.828E-01 *(P 1.373E-01 5.56E-02 G

PB-212       6.6016E-01
                          238.63 6.458E-01  (P 4.771E-02 2.23E-02 G K
                                                          Energy duplication
                           77.11 4.514E-01 }   1.771E-01 4.95E-02 G
                           74.81 8.015E-01 + P 3.292E-01 1.07E-01 G

PB-214       4.3913E-01
                          351.99 4.349E-01  (P 6.941E-02 3.09E-02 G K
                          295.22 4.472E-01  (P 1.202E-01 4.72E-02 G
                                                          Energy duplication
                           77.11 3.712E-01 } P 3.833E-01 1.06E-01 G
                          241.92 5.705E-01 + P 3.208E-01 1.03E-01 G

BI-212       4.9822E-01
                          727.17 4.982E-01  (P 2.177E-01 8.53E-02 G K
                         1620.56 9.177E-01 + P 3.454E-01 1.97E-01 G
                          785.42 1.773E-01 % P 1.395E+00 4.07E-01 G

BI-214       4.0269E-01
                          609.32 3.898E-01  (P 6.564E-02 3.13E-02 G K
                         1764.51 5.538E-01 + P 9.907E-02 6.60E-02 G
                         1120.28 4.423E-01 *(P 2.522E-01 9.94E-02 G

RA-224       5.3238E-01
                          241.00 5.324E-01 %(P 8.795E-01 2.68E-01 G

RA-226       8.6909E-01
                          185.99 8.691E-01  (  7.360E-01 2.50E-01 G

AC-228       7.2619E-01
                          911.07 7.017E-01  (P 1.112E-01 5.58E-02 G K
                          968.90 7.707E-01  (P 1.566E-01 6.74E-02 G
                          338.40 7.205E-01  (P 2.117E-01 8.81E-02 G
```

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 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments

TH-227      -2.6052E-01
                          236.00-2.605E-01 ?(P 3.311E-01 1.01E-01 G K
                          256.25-3.742E-03 & P 3.520E-01 1.04E-01 G

PA-234      -5.7986E-02
                           98.44-5.799E-02 %(  1.170E-01 3.55E-02 G K
                          946.00 6.384E-02 &   1.344E-01 4.08E-02 G
                          131.28-2.667E-02 &   1.531E-01 4.60E-02 G
                           94.67-1.187E-01 %   2.244E-01 6.82E-02 G
                          883.24-5.580E-03 %   2.294E-01 6.61E-02 G
                          926.70-2.775E-05 %   2.556E-01 7.34E-02 G
                          569.26-7.198E-03 &   2.594E-01 7.58E-02 G

TH-234       9.0761E-01
                           63.29 6.235E-02 %(P 1.527E+00 4.56E-01 G K
                           92.80 1.360E+00  (P 1.216E+00 3.74E-01 G
                           92.38 1.663E+00  (P 1.447E+00 4.47E-01 G

AM-241      -1.8868E-03
                           59.54-1.887E-03 %(P 2.031E-01 6.07E-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	3.3494E-02	3.4434E-02	1.9914E-01	1.9915E-01	2.188E-01
K-40		1.5912E+01	1.5912E+01	1.0515E+00	1.4103E+00	
MN-54	#A	-1.0938E-02	-1.0990E-02	2.8346E-02	2.8353E-02	3.017E-02
CO-57	#B	1.0086E-02	1.0142E-02	2.8968E-02	2.8974E-02	3.184E-02
CO-60	#B	-1.9019E-03	-1.9034E-03	1.4770E-01	1.4770E-01	3.241E-02
Sr-85	#A	-1.3780E-02	-1.4097E-02	3.0175E-02	3.0187E-02	3.253E-02
Kr-85	#A	-3.5345E+02	-3.5346E+02	7.8969E+02	7.8996E+02	7.589E+02
Y-88	#B	-1.6670E-03	-1.6903E-03	4.6974E-02	4.6975E-02	2.154E-02
NB-94	#B	-1.1302E-02	-1.1302E-02	2.5106E-02	2.5115E-02	2.746E-02
Ag-108M	#B	-1.3112E-02	-1.3112E-02	3.2861E-02	3.2870E-02	3.646E-02
CD-109	#A	-5.5938E-02	-5.6120E-02	1.0634E+00	1.0634E+00	1.111E+00
SN-113	#B	-6.1126E-03	-6.1916E-03	4.3750E-02	4.3752E-02	3.725E-02
SB-125	#F	8.3736E-02	8.3858E-02	6.4770E-02	6.4959E-02	7.174E-02
I-131	#B	-3.0320E-03	-3.6436E-03	2.8007E-02	2.8008E-02	2.629E-02
CS-134	#B	1.6104E-02	1.6136E-02	1.3835E-02	1.3868E-02	5.669E-02
CS-137	#A	-9.5496E-03	-9.5508E-03	4.1071E-02	4.1075E-02	3.170E-02
CE-139	#A	5.2501E-03	5.3068E-03	2.8734E-02	2.8736E-02	3.161E-02
EU-152	#B	5.8799E-03	5.8818E-03	7.3099E-02	7.3099E-02	8.161E-02
EU-154	#B	-5.9301E-03	-5.9329E-03	7.2580E-02	7.2581E-02	7.480E-02
EU-155	#A	1.0092E-01	1.0100E-01	1.1302E-01	1.1316E-01	1.230E-01
HG-203	#B	-1.2204E-02	-1.2597E-02	2.9087E-02	2.9097E-02	2.937E-02
TL-208	#	2.5844E-01	2.5844E-01	5.7459E-02	5.9452E-02	
PB-212		6.6016E-01	6.6016E-01	6.8395E-02	7.8727E-02	
PB-214		4.3913E-01	4.3913E-01	8.3826E-02	8.7746E-02	
BI-212		4.9822E-01	4.9822E-01	2.5575E-01	2.5744E-01	
BI-214		4.0269E-01	4.0269E-01	9.7107E-02	9.9977E-02	
RA-224	#A	5.3238E-01	5.3238E-01	8.0319E-01	8.0381E-01	8.795E-01
RA-226		8.6908E-01	8.6909E-01	7.4831E-01	7.5007E-01	
AC-228		7.2619E-01	7.2619E-01	1.2348E-01	1.3072E-01	
TH-227	#A	-2.6052E-01	-2.6052E-01	3.0512E-01	3.0551E-01	3.311E-01
PA-234	#B	-5.7986E-02	-5.7986E-02	1.0652E-01	1.0657E-01	1.170E-01
TH-234	#B	9.0761E-01	9.0761E-01	7.3133E-01	7.3306E-01	1.527E+00
AM-241	#A	-1.8868E-03	-1.8868E-03	3.9970E-01	3.9970E-01	2.031E-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_28JUN2006_1930.An1

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

Total Activity (1120.2 to 2000.1 keV) 1.9766369E+01 pCi/gm
Total Decayed Activity (1120.2 to 2000.1 keV) 1.9766371E+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_28JUNE2006_1123.An1

Sample description
FSS-OOL-10-03-010-F

Spectrum Filename: C:\GammaVision\Spectra\107F_28JUNE2006_1123.An1

Acquisition information
Start time: 28-Jun-2006 11:25:54
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: 1.7230E+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	26-Jun-2006 14:30:00
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. 19 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.2566

***** 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	268.	15.48	1.18	2.842E-02	70.83	3.520	2.337E+00	HG203
					74.81	9.600	7.565E-01	PB212
77.19	492.	8.34	1.18	2.972E-02	77.11	17.500	7.460E-01	PB212
					77.11	10.700	1.208E+00	PB214
87.82	102.	35.74	1.19	3.316E-02	86.45	32.740	7.471E-02	EU155
92.46	162.	23.12	1.19	3.427E-02				
92.46	162.	23.12	1.19	3.427E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
128.45	140.	39.83	0.95	3.817E-02				
186.13	181.	15.32	1.26	3.609E-02	185.99	3.280	1.201E+00	RA226
209.51	100.	27.20	1.76	3.427E-02				
238.77	1167.	3.66	1.30	3.188E-02	238.63	43.100	6.571E-01	PB212
241.86	191.	16.96	1.30	3.163E-02	241.00	3.900	1.195E+00	RA224
					241.92	7.470	6.281E-01	PB214
270.60	88.	34.05	0.90	2.942E-02				
295.41	263.	9.26	1.34	2.766E-02	295.22	19.200	3.814E-01	PB214
300.51	72.	27.20	1.34	2.732E-02				
328.17	85.	32.71	1.90	2.559E-02				
338.50	254.	11.23	1.54	2.500E-02	338.40	12.010	6.539E-01	AC228
352.14	515.	8.32	1.63	2.425E-02	351.99	37.100	4.442E-01	PB214
463.23	92.	21.32	1.72	1.954E-02				
463.23	92.	21.32	1.72	1.954E-02	463.51	10.000	3.607E-01	SB125
510.46	210.	14.66	2.13	1.809E-02	510.72	22.500	3.404E-01	TL208
583.41	496.	7.78	1.49	1.628E-02	583.14	86.000	2.749E-01	TL208
609.57	358.	8.68	1.44	1.574E-02	609.32	46.090	3.823E-01	BI214
727.64	143.	16.59	1.79	1.374E-02	727.17	11.800	6.854E-01	BI212
795.56	78.	21.97	1.42	1.284E-02				

795.56	78.	21.97	1.42	1.284E-02	795.76	85.400	5.544E-02	CS134
830.69	31.	27.96	1.71	1.239E-02	834.81	99.978	1.968E-02	MN54
911.57	273.	7.36	1.75	1.160E-02	911.07	29.000	6.271E-01	AC228
968.85	294.	9.05	2.11	1.109E-02	968.90	17.460	1.181E+00	AC228
1120.41	126.	21.60	1.81	9.969E-03	1120.28	15.040	6.534E-01	BI214
1412.70	9.	40.07	2.08	8.420E-03	1408.08	21.210	PBC<MDA	EU152
1461.27	1517.	2.60	2.09	8.189E-03	1460.75	10.700	1.353E+01	K40

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
1622.11	44.	19.98	0.68	7.569E-03	1620.56	2.750	1.662E+00	BI212
1765.01	73.	12.63	1.82	7.082E-03	1764.51	15.920	5.015E-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	
175.31	87.64	618.	102.	0.051	107.22	1.187	PB-214	lD
256.56	128.45	973.	183.	0.092	75.49	0.954	AC-228	s
418.67	209.51	320.	100.	0.050	81.61	1.758	AC-228	s
540.82	270.60	324.	88.	0.044	102.16	0.901	AC-228	
600.65	300.52	198.	69.	0.034	95.73	1.089	PB-212	M
655.95	328.17	257.	85.	0.043	98.12	1.896	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	690.	302.	0.151	40.19	1.178D
PB-212	153.89	77.11	710.	343.	0.171	30.95	1.179A
PB-214	153.89	77.11	1247.	142.	0.071	100.44	1.500A
TH-234	185.37	92.85	1350.	144.	0.072	105.31	1.500s
TH-234	185.33	92.83	1328.	132.	0.066	104.36	1.500s
RA-226	371.92	186.14	603.	192.	0.096	65.62	1.555s
TH-227	472.24	236.30	1205.	-124.	-0.062	121.78	1.500
PB-212	476.89	238.63	293.	1145.	0.573	10.70	1.297D
PB-214	483.47	241.92	438.	180.	0.090	53.79	1.299D
PB-214	590.46	295.42	279.	264.	0.132	34.52	1.645s
AC-228	676.61	338.50	218.	250.	0.125	33.69	1.535s
PB-214	703.89	352.14	352.	510.	0.255	24.96	1.633s
SB-125	925.96	463.18	134.	77.	0.038	69.61	1.500s
TL-208	1020.51	510.46	233.	177.	0.088	43.98	2.133s
TL-208	1166.41	583.41	225.	491.	0.245	23.35	1.494
BI-214	1218.72	609.57	173.	354.	0.177	26.05	1.442
Ag-108M	1223.38	611.90	266.	-84.	-0.042	88.79	1.561s
BI-212	1454.86	727.64	121.	142.	0.071	49.78	1.786s
CS-134	1590.42	795.43	70.	64.	0.032	66.37	1.684s
MN-54	1660.95	830.69	23.	31.	0.015	83.88	1.710

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
AC-228	1822.70	911.57	59.	269.	0.135	22.07	1.746
AC-228	1937.27	968.85	92.	292.	0.146	27.15	2.110s
BI-214	2240.39	1120.41	134.	125.	0.062	64.81	1.810s
K-40	2922.14	1461.27	17.	1512.	0.756	7.79	2.090
BI-212	3243.84	1622.11	8.	44.	0.022	59.93	0.680s
BI-214	3529.67	1765.01	5.	72.	0.036	37.89	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		9.4760E-02					
			477.56	9.476E-02	%(	2.240E-01 6.76E-02 G	
K-40		1.3533E+01					
			1460.75	1.353E+01	(P	1.948E-01 3.53E-01 G	
MN-54		1.9684E-02					
			834.81	1.968E-02	&(P	1.601E-02 5.58E-03 G	
CO-57		4.9049E-03					
			122.07	4.905E-03	&(P	3.572E-02 1.07E-02 G K	
			136.43	4.150E-02	% P	2.795E-01 8.37E-02 G	
CO-60		8.4317E-03					
			1332.51	8.432E-03	&(P	3.168E-02 9.13E-03 G K	
			1173.23	1.383E-02	& P	3.855E-02 1.14E-02 G K	
Sr-85		-1.5690E-02					
			514.00	-1.569E-02	%(	3.627E-02 1.10E-02 G	
Kr-85		-3.8537E+02					
			513.99	-3.854E+02	%(P	8.249E+02 2.48E+02 G	
Y-88		-1.3966E-03					
			1836.01	-1.397E-03	%(P	2.139E-02 5.38E-03 G K	
			898.02	-1.113E-03	& P	3.732E-02 1.07E-02 G	
NB-94		-3.2879E-04					
			871.10	-3.288E-04	&(P	2.329E-02 6.53E-03 G K	
			702.50	-5.337E-03	& P	3.097E-02 9.08E-03 G K	

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
Ag-108M	-7.8115E-03						
		722.95	-7.811E-03	&(	4.283E-02	1.27E-02	G K
		614.37	-4.648E-02	+	4.363E-02	1.38E-02	G
		433.93	9.017E-04	& P	2.689E-02	7.82E-03	G
CD-109	9.0096E-03						
		88.04	9.010E-03	%(P	1.111E+00	3.32E-01	G
SN-113	2.1700E-03						
		391.71	2.170E-03	&(P	3.818E-02	1.12E-02	G K
		255.04	-9.555E-02	&	1.276E+00	3.79E-01	G
SB-125	8.8629E-02						
		427.95	1.420E-02	%(P	7.919E-02	2.33E-02	G K
		600.77	2.552E-02	% P	1.429E-01	4.19E-02	G
		636.15	9.664E-02	% P	1.725E-01	5.28E-02	G
		463.51	3.089E-01	*(P	2.276E-01	7.43E-02	G
		176.29	1.001E-01	% P	4.136E-01	1.24E-01	G
I-131	6.3498E-04						
		364.48	6.350E-04	&(	3.207E-02	9.35E-03	G K
		636.97	-1.023E-02	%	3.722E-01	1.07E-01	G
		284.29	-9.579E-02	%	5.163E-01	1.54E-01	G
CS-134	-1.8360E-02						
		604.66	-1.836E-02	&(P	3.656E-02	1.11E-02	G K
		795.76	4.585E-02	+ P	2.990E-02	1.02E-02	G
		569.29	-2.064E-02	%	1.800E-01	5.27E-02	G
		801.84	-5.926E-02	% P	3.158E-01	9.21E-02	G
CS-137	1.5075E-02						
		661.62	1.508E-02	%(P	3.404E-02	1.02E-02	G
CE-139	-9.1540E-03						
		165.85	-9.154E-03	%(P	3.563E-02	1.07E-02	G
EU-152	1.6962E-02						
		121.78	1.696E-02	%(P	1.063E-01	3.19E-02	G K
		344.30	-9.543E-03	% P	9.402E-02	2.77E-02	G
		1408.08	3.751E-02	% P	4.707E-02	1.63E-02	G
		964.00	2.055E-02	& P	3.650E-01	1.07E-01	G
		1112.07	5.281E-02	% P	2.382E-01	6.96E-02	G
		778.90	3.120E-03	% P	2.471E-01	7.12E-02	G
EU-154	-1.4577E-02						
		123.10	-1.458E-02	&(P	7.901E-02	2.37E-02	G K
		1274.80	5.525E-03	% P	8.636E-02	2.44E-02	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          723.30-1.277E-03 & P 3.089E-01 9.13E-02 G
                         1004.80 4.129E-02 % P 1.689E-01 4.96E-02 G

EU-155       7.8042E-02
                           86.45 7.804E-02 %(  1.284E-01 3.91E-02 G K
                          105.31 2.407E-02 % P 1.518E-01 4.55E-02 G

HG-203      -9.1567E-03
                          279.17-9.157E-03 %(P 3.359E-02 1.00E-02 G K
                           72.87-1.821E-01 % P 9.851E-01 2.96E-01 G
                           70.83-1.029E+00 &   1.594E+00 4.86E-01 G
                           82.50-4.748E-01 &   1.911E+00 5.75E-01 G

TL-208       2.7486E-01
                          583.14 2.749E-01  (P 4.065E-02 2.16E-02 G
                          510.72 3.404E-01 + P 1.425E-01 5.94E-02 G

PB-212       6.5347E-01
                          238.63 6.535E-01  (P 4.703E-02 2.36E-02 G K
                                                          Energy duplication
                           77.11 5.196E-01 }   1.923E-01 5.36E-02 G
                           74.81 8.657E-01 + P 3.588E-01 1.17E-01 G

PB-214       4.2557E-01
                          351.99 4.442E-01 @(P 7.859E-02 3.73E-02 G K
                          295.22 3.896E-01  (P 1.189E-01 4.56E-02 G
                                                          Energy duplication
                           77.11 3.530E-01 } P 4.147E-01 1.18E-01 G
                          241.92 5.965E-01 + P 3.328E-01 1.08E-01 G

BI-212       6.8539E-01
                          727.17 6.854E-01 *(P 2.613E-01 1.15E-01 G K
                         1620.56 1.662E+00 + P 5.957E-01 3.36E-01 G
                          785.42 7.372E-01 % P 1.438E+00 4.36E-01 G

BI-214       3.8231E-01
                          609.32 3.823E-01  (P 6.925E-02 3.36E-02 G K
                         1764.51 5.015E-01 + P 9.056E-02 6.41E-02 G
                         1120.28 6.534E-01 + P 2.964E-01 1.42E-01 G

RA-224       5.6172E-01
                          241.00 5.617E-01 %(P 9.356E-01 2.85E-01 G

RA-226       1.2704E+00
                          185.99 1.270E+00  (  7.760E-01 2.78E-01 G

AC-228       6.3498E-01
                          911.07 6.271E-01  (P 8.959E-02 4.69E-02 G K
                          968.90 1.181E+00 + P 1.922E-01 1.08E-01 G
                          338.40 6.539E-01 @(P 1.866E-01 7.44E-02 G
```

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments

TH-227      -2.7102E-01
                          236.00-2.710E-01  (P 3.587E-01 1.10E-01 G K
                          256.25-1.170E-02 % P 2.822E-01 8.22E-02 G

PA-234      -1.5133E-02
                           98.44-1.513E-02 &(  1.350E-01 4.04E-02 G K
                          946.00 3.031E-02 %   1.396E-01 4.08E-02 G
                          131.28-4.200E-02 %   1.569E-01 4.72E-02 G
                           94.67-7.616E-02 %   2.553E-01 7.70E-02 G
                          883.24-1.499E-02 %   2.290E-01 6.56E-02 G
                          926.70 1.240E-01 %   2.597E-01 7.88E-02 G
                          569.26-3.176E-02 %   2.668E-01 7.82E-02 G

TH-234       9.3458E-01
                           63.29 6.574E-01 %(P 1.594E+00 4.81E-01 G K
                           92.80 1.000E+00  (P 1.312E+00 4.00E-01 G
                           92.38 1.279E+00  (P 1.548E+00 4.74E-01 G

AM-241       7.2198E-03
                           59.54 7.220E-03 %(P 2.068E-01 6.17E-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	9.2485E-02	9.4760E-02	2.0266E-01	2.0274E-01	2.186E-01
K-40		1.3533E+01	1.3533E+01	1.0580E+00	1.3259E+00	
MN-54	#	1.9602E-02	1.9684E-02	1.6740E-02	1.6780E-02	1.594E-02
CO-57	#B	4.8814E-03	4.9049E-03	3.2090E-02	3.2091E-02	3.555E-02
CO-60	#B	8.4260E-03	8.4317E-03	2.7387E-02	2.7391E-02	3.166E-02
Sr-85	#A	-1.5379E-02	-1.5690E-02	3.2893E-02	3.2906E-02	3.555E-02
Kr-85	#A	-3.8537E+02	-3.8537E+02	8.7149E+02	8.7179E+02	8.249E+02
Y-88	#B	-1.3797E-03	-1.3966E-03	8.4080E-02	8.4080E-02	2.113E-02
NB-94	#B	-3.2879E-04	-3.2879E-04	3.4123E-02	3.4123E-02	2.329E-02
Ag-108M	#B	-7.8113E-03	-7.8115E-03	3.8027E-02	3.8029E-02	4.283E-02
CD-109	#A	8.9839E-03	9.0096E-03	9.9664E-01	9.9664E-01	1.108E+00
SN-113	#B	2.1457E-03	2.1700E-03	3.3483E-02	3.3483E-02	3.775E-02
SB-125	#F	8.8515E-02	8.8629E-02	6.3951E-02	6.4165E-02	7.909E-02
I-131	#B	5.4034E-04	6.3498E-04	2.8062E-02	2.8062E-02	2.729E-02
CS-134	#B	-1.8328E-02	-1.8360E-02	3.4245E-02	3.4262E-02	3.650E-02
CS-137	#A	1.5073E-02	1.5075E-02	3.0650E-02	3.0663E-02	3.403E-02
CE-139	#A	-9.0680E-03	-9.1540E-03	3.2755E-02	3.2759E-02	3.529E-02
EU-152	#B	1.6958E-02	1.6962E-02	9.5593E-02	9.5598E-02	1.063E-01
EU-154	#B	-1.4571E-02	-1.4577E-02	7.3868E-02	7.3872E-02	7.898E-02
EU-155	#B	7.7986E-02	7.8042E-02	1.1729E-01	1.1737E-01	1.283E-01
HG-203	#B	-8.9052E-03	-9.1567E-03	3.3216E-02	3.3220E-02	3.267E-02
TL-208		2.7486E-01	2.7486E-01	6.4782E-02	6.6784E-02	
PB-212		6.5347E-01	6.5347E-01	7.0881E-02	8.0707E-02	
PB-214		4.2557E-01	4.2557E-01	9.1982E-02	9.5354E-02	
BI-212		6.8539E-01	6.8539E-01	3.4427E-01	3.4664E-01	
BI-214		3.8231E-01	3.8231E-01	1.0081E-01	1.0331E-01	
RA-224	#A	5.6172E-01	5.6172E-01	8.5466E-01	8.5531E-01	9.356E-01
RA-226		1.2704E+00	1.2704E+00	8.3363E-01	8.3700E-01	
AC-228		6.3498E-01	6.3498E-01	1.2962E-01	1.3493E-01	
TH-227	#A	-2.7102E-01	-2.7102E-01	3.3077E-01	3.3116E-01	3.587E-01
PA-234	#B	-1.5133E-02	-1.5133E-02	1.2122E-01	1.2122E-01	1.350E-01
TH-234	#B	9.3458E-01	9.3458E-01	8.5271E-01	8.5429E-01	1.594E+00
AM-241	#A	7.2197E-03	7.2198E-03	1.8516E-01	1.8516E-01	2.068E-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) 1.7859943E+01 pCi/gm
Total Decayed Activity (270.2 to 2000.1 keV) 1.7859945E+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_29JUN2006_1546.An1

Sample description
FSS-OOL-10-03-018-F

Spectrum Filename: C:\GammaVision\Spectra\107F_29JUN2006_1546.An1

Acquisition information
Start time: 29-Jun-2006 15:46:15
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: 2.1860E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 2.1860E+03) =
4.5746E+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	26-Jun-2006 14:56:00
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. 24 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.2634

***** 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
74.53	435.	12.06	1.18	2.854E-02	74.81	9.600	9.736E-01	PB212
77.29	674.	7.14	1.18	2.981E-02	77.11	17.500	8.055E-01	PB212
					77.11	10.700	1.308E+00	PB214
86.89	298.	14.47	1.19	3.290E-02	86.45	32.740	1.713E-01	EU155
					88.04	3.790	1.464E+00	CD109
89.91	199.	21.28	1.19	3.368E-02				
93.46	199.	21.05	1.19	3.448E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
129.58	151.	37.85	0.79	3.819E-02				
129.58	151.	37.85	0.79	3.819E-02	131.28	20.000	1.219E-01	PA234
185.90	212.	23.15	1.19	3.611E-02	185.99	3.280	1.107E+00	RA226
208.80	183.	27.60	1.21	3.432E-02				
238.76	1686.	2.88	1.30	3.188E-02	238.63	43.100	7.512E-01	PB212
241.67	258.	13.59	1.30	3.165E-02	241.00	3.900	1.278E+00	RA224
					241.92	7.470	6.711E-01	PB214
270.01	147.	23.03	1.19	2.946E-02				
277.53	110.	36.93	1.00	2.891E-02				
295.33	370.	7.60	1.34	2.768E-02				
295.33	370.	7.60	1.34	2.768E-02	295.22	19.200	4.251E-01	PB214
300.42	108.	21.42	1.34	2.734E-02				
327.62	142.	21.01	1.87	2.563E-02				
338.52	437.	11.06	1.39	2.500E-02	338.40	12.010	8.930E-01	AC228
352.10	702.	6.23	1.24	2.425E-02	351.99	37.100	4.784E-01	PB214
462.99	101.	30.22	1.04	1.954E-02				
462.99	101.	30.22	1.04	1.954E-02	463.51	10.000	3.102E-01	SB125
477.96	80.	36.05	0.85	1.906E-02	477.56	10.300	2.606E-01	BE7
510.80	301.	10.82	1.35	1.808E-02	510.72	22.500	4.059E-01	TL208

583.40	610.	6.29	1.49	1.628E-02	583.14	86.000	2.670E-01	TL208
609.51	516.	7.93	1.30	1.574E-02	609.32	46.090	4.358E-01	BI214
661.67	86.	29.40	1.58	1.477E-02	661.62	84.620	4.089E-02	CS137
727.56	148.	23.01	1.42	1.374E-02	727.17	11.800	5.581E-01	BI212
795.45	63.	22.70	1.50	1.284E-02				
795.45	63.	22.70	1.50	1.284E-02	795.76	85.400	3.543E-02	CS134
861.30	109.	21.01	1.63	1.210E-02				
911.50	427.	6.16	1.12	1.160E-02	911.07	29.000	7.760E-01	AC228
967.89	356.	7.87	1.55	1.110E-02	964.00	14.580	1.357E+00	EU152
					968.90	17.460	1.130E+00	AC228

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
1120.95	148.	20.32	1.81	9.966E-03	1120.28	15.040	6.065E-01	BI214
1461.21	2041.	2.29	1.94	8.189E-03	1460.75	10.700	1.436E+01	K40
1621.96	45.	21.55	1.11	7.569E-03	1620.56	2.750	1.327E+00	BI212
1765.02	78.	11.97	0.95	7.084E-03	1764.51	15.920	4.292E-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	
148.72	74.91	1157.	435.	0.217	36.19	1.177	BI-207	D
154.24	77.67	823.	674.	0.337	21.43	1.180	PB-214	D
178.34	89.70	858.	137.	0.068	94.43	1.188	PB-214	D
185.43	93.25	730.	245.	0.122	50.58	1.191	U-235	D
258.81	129.58	1195.	151.	0.075	113.56	0.786	AC-228	l
417.25	208.80	848.	183.	0.092	82.81	1.215	LU-177	
477.16	238.78	337.	1686.	0.843	8.64	1.297	PB-212	D
482.96	241.68	485.	258.	0.129	40.76	1.299	PB-214	D
539.65	270.01	419.	147.	0.074	69.08	1.194	AC-228	
554.69	277.53	499.	141.	0.070	72.03	1.004	NP-239	
600.08	300.23	263.	105.	0.052	71.80	1.465	PB-212	
654.87	327.62	290.	142.	0.071	63.04	1.868	AC-228	s
955.51	477.96	225.	80.	0.040	108.15	0.855	BE-7	l
1722.17	861.30	114.	109.	0.054	50.75	1.626	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	149.34	74.84	2270.	354.	0.177	58.55	1.500s
PB-212	153.89	77.11	1930.	616.	0.308	32.59	1.500D
PB-214	153.89	77.11	1934.	611.	0.306	32.59	1.500D
EU-155	173.91	87.12	1870.	275.	0.138	69.06	1.500
CD-109	175.74	88.04	928.	222.	0.111	61.64	1.187D
TH-234	185.60	92.97	1801.	192.	0.096	87.05	1.500
RA-226	371.44	185.90	879.	212.	0.106	69.46	1.193
PB-212	477.18	238.77	974.	1444.	0.722	11.94	1.500
RA-224	482.87	241.62	1156.	162.	0.081	90.89	1.500s
PB-214	590.33	295.35	458.	334.	0.167	31.28	1.500
AC-228	676.65	338.52	516.	434.	0.217	33.17	1.386

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
PB-214	703.90	352.14	297.	642.	0.321	16.26	1.500
SB-125	925.93	463.17	195.	75.	0.038	82.73	1.500
TL-208	1021.20	510.80	257.	267.	0.134	32.47	1.353s
TL-208	1166.39	583.40	225.	605.	0.303	18.86	1.490
BI-214	1218.59	609.51	280.	511.	0.256	23.78	1.305
Ag-108M	1222.80	611.61	341.	-126.	-0.063	67.74	1.561s
CS-137	1322.92	661.67	177.	83.	0.041	88.21	1.579
BI-212	1454.59	727.51	229.	169.	0.085	60.81	1.445
CS-134	1590.48	795.46	95.	67.	0.034	70.65	1.684
AC-228	1822.57	911.50	95.	423.	0.211	18.48	1.116s
AC-228	1935.35	967.89	122.	354.	0.177	23.61	1.545s
BI-214	2241.46	1120.95	169.	147.	0.074	60.95	1.808s
K-40	2922.02	1461.21	37.	2036.	1.018	6.86	1.937
BI-212	3243.55	1621.96	11.	45.	0.022	64.65	1.109s
BI-214	3529.69	1765.02	4.	78.	0.039	35.90	0.948s

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		8.1764E-02					
			477.56	8.176E-02	%(	2.235E-01	6.71E-02 G
K-40		1.4363E+01					
			1460.75	1.436E+01	(P	2.183E-01	3.29E-01 G
MN-54		6.5359E-03					
			834.81	6.536E-03	%(P	2.897E-02	8.57E-03 G
CO-57		4.7467E-03					
			122.07	4.747E-03	%(P	3.237E-02	9.71E-03 G K
			136.43	3.545E-02	% P	2.628E-01	7.88E-02 G
CO-60		7.6934E-03					
			1332.51	7.693E-03	%(P	2.642E-02	7.67E-03 G K
			1173.23	9.840E-03	% P	3.853E-02	1.14E-02 G K
Sr-85		-1.2079E-02					
			514.00	-1.208E-02	&(	3.227E-02	9.72E-03 G
Kr-85		-2.9383E+02					
			513.99	-2.938E+02	&(P	7.242E+02	2.17E+02 G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
Y-88	-3.1555E-03						
		1836.01	-3.156E-03	%(P	2.082E-02	5.63E-03	G K
		898.02	-2.585E-03	% P	3.224E-02	9.31E-03	G
NB-94	1.1195E-03						
		871.10	1.120E-03	%(P	2.391E-02	6.87E-03	G K
		702.50	1.125E-02	% P	2.408E-02	7.29E-03	G K
Ag-108M	-1.4215E-02						
		722.95	-1.421E-02	&(	3.569E-02	1.08E-02	G K
		614.37	-5.506E-02	+	3.883E-02	1.24E-02	G
		433.93	-5.625E-04	% P	2.635E-02	7.70E-03	G
CD-109	1.0914E+00						
		88.04	1.091E+00	(P	7.128E-01	2.25E-01	G
SN-113	1.7548E-03						
		391.71	1.755E-03	%(P	3.662E-02	1.08E-02	G K
		255.04	8.986E-02	%	1.153E+00	3.43E-01	G
SB-125	6.6502E-02						
		427.95	8.338E-03	%(P	6.629E-02	1.95E-02	G K
		600.77	-2.968E-02	% P	1.388E-01	4.09E-02	G
		636.15	-1.216E-03	% P	2.216E-01	6.42E-02	G
		463.51	2.387E-01	(P	2.152E-01	6.83E-02	G
		176.29	-6.190E-03	% P	4.185E-01	1.25E-01	G
I-131	-2.6592E-03						
		364.48	-2.659E-03	&(	3.450E-02	1.02E-02	G K
		636.97	1.002E-01	%	4.259E-01	1.26E-01	G
		284.29	-1.020E-01	%	4.711E-01	1.41E-01	G
CS-134	1.7910E-02						
		604.66	2.324E-04	%(P	5.507E-02	1.64E-02	G K
		795.76	3.811E-02	(P	2.715E-02	9.05E-03	G
		569.29	7.953E-03	%	1.559E-01	4.55E-02	G
		801.84	5.141E-02	& P	2.810E-01	8.24E-02	G
CS-137	4.0893E-02						
		661.62	4.089E-02	(P	3.204E-02	1.25E-02	G
CE-139	-1.4967E-03						
		165.85	-1.497E-03	%(P	3.062E-02	9.13E-03	G
EU-152	1.4338E-02						
		121.78	1.434E-02	%(P	9.702E-02	2.91E-02	G K
		344.30	-1.450E-02	% P	8.663E-02	2.57E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
		1408.08	4.307E-02	% P	9.101E-02	2.75E-02	G
		964.00	-2.751E-03	% P	3.238E-01	9.52E-02	G
		1112.07	-7.804E-04	% P	2.088E-01	5.95E-02	G
		778.90	-2.648E-03	% P	1.952E-01	5.61E-02	G
EU-154	-6.0235E-03						
		123.10	-6.023E-03	&(P	7.063E-02	2.12E-02	G K
		1274.80	2.217E-02	& P	9.168E-02	2.70E-02	G
		723.30	-4.267E-02	& P	1.642E-01	4.89E-02	G
		1004.80	4.082E-02	& P	1.741E-01	5.15E-02	G
EU-155	1.5848E-01						
		86.45	1.585E-01	(	1.176E-01	3.65E-02	G K
		105.31	3.816E-02	& P	1.411E-01	4.25E-02	G
HG-203	-9.6370E-03						
		279.17	-9.637E-03	%(P	3.000E-02	9.01E-03	G K
		72.87	-5.085E-01	& P	9.149E-01	2.78E-01	G
		70.83	5.511E-01	%	1.450E+00	4.39E-01	G
		82.50	-6.660E-01	%	1.869E+00	5.65E-01	G
TL-208	2.6699E-01						
		583.14	2.670E-01	(P	3.204E-02	1.69E-02	G
		510.72	4.059E-01	+ P	1.176E-01	4.95E-02	G
PB-212	6.7421E-01						
		238.63	6.493E-01	(P	6.662E-02	2.61E-02	G K
							Energy duplication
		77.11	7.356E-01	*(	2.478E-01	7.99E-02	G
		74.81	8.009E-01	& P	5.078E-01	1.58E-01	G
PB-214	4.2319E-01						
		351.99	4.412E-01	(P	5.704E-02	2.41E-02	G K
		295.22	3.885E-01	(P	1.192E-01	4.11E-02	G
							Energy duplication
		77.11	1.194E+00	+ P	4.057E-01	1.31E-01	G
		241.92	3.089E-01	% P	4.350E-01	1.33E-01	G
BI-212	6.4505E-01						
		727.17	6.451E-01	(P	2.790E-01	1.32E-01	G K
		1620.56	1.327E+00	+ P	5.458E-01	2.89E-01	G
		785.42	4.475E-01	% P	1.371E+00	4.09E-01	G
BI-214	4.3411E-01						
		609.32	4.358E-01	(P	6.869E-02	3.48E-02	G K
		1764.51	4.292E-01	(P	6.397E-02	5.20E-02	G
		1120.28	6.065E-01	+ P	2.608E-01	1.24E-01	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments

RA-224       8.0906E-01
                          241.00 8.091E-01 ?(P 8.055E-01 2.49E-01 G

RA-226       1.1068E+00
                          185.99 1.107E+00  (  7.354E-01 2.56E-01 G

AC-228       8.1026E-01
                          911.07 7.760E-01  (P 8.858E-02 4.83E-02 G K
                          968.90 1.130E+00 + P 1.728E-01 8.95E-02 G
                          338.40 8.930E-01  (P 2.235E-01 9.95E-02 G

TH-227      -1.8971E-01
                          236.00-1.897E-01 %(P 2.936E-01 8.95E-02 G K
                          256.25 2.684E-02 % P 3.428E-01 1.02E-01 G

PA-234      -4.0942E-02
                           98.44-4.094E-02 %(  1.271E-01 3.84E-02 G K
                          946.00 2.552E-03 %   1.359E-01 3.91E-02 G
                          131.28 8.208E-02 %   1.200E-01 3.67E-02 G
                           94.67-4.014E-02 &   2.305E-01 6.93E-02 G
                          883.24-2.104E-02 &   1.920E-01 5.55E-02 G
                          926.70 6.730E-03 &   2.193E-01 6.28E-02 G
                          569.26 1.175E-02 %   2.307E-01 6.74E-02 G

TH-234       8.3897E-01
                           63.29 5.991E-01 %(P 1.505E+00 4.54E-01 G K
                           92.80 1.151E+00  (P 1.202E+00 3.68E-01 G
                           92.38-4.846E-02 % P 1.441E+00 4.31E-01 G

AM-241       5.4247E-03
                           59.54 5.425E-03 %(P 1.985E-01 5.94E-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	7.8605E-02	8.1764E-02	2.0144E-01	2.0150E-01	2.148E-01
K-40		1.4363E+01	1.4363E+01	9.8694E-01	1.3014E+00	
MN-54	#A	6.4920E-03	6.5359E-03	2.5695E-02	2.5698E-02	2.877E-02
CO-57	#B	4.7098E-03	4.7467E-03	2.9135E-02	2.9137E-02	3.212E-02
CO-60	#B	7.6850E-03	7.6934E-03	2.3016E-02	2.3021E-02	2.639E-02
Sr-85	#A	-1.1694E-02	-1.2079E-02	2.9175E-02	2.9183E-02	3.124E-02
Kr-85	#A	-2.9382E+02	-2.9383E+02	7.6750E+02	7.6770E+02	7.242E+02
Y-88	#B	-3.0938E-03	-3.1555E-03	2.7466E-02	2.7467E-02	2.041E-02
NB-94	#B	1.1195E-03	1.1195E-03	2.0614E-02	2.0614E-02	2.391E-02
Ag-108M	#B	-1.4214E-02	-1.4215E-02	3.2265E-02	3.2276E-02	3.568E-02
CD-109		1.0863E+00	1.0914E+00	6.7369E-01	6.7640E-01	
SN-113	#B	1.7230E-03	1.7548E-03	3.2311E-02	3.2311E-02	3.595E-02
SB-125	#F	6.6364E-02	6.6502E-02	5.7075E-02	5.7210E-02	6.615E-02
I-131	#B	-2.0470E-03	-2.6592E-03	3.0539E-02	3.0540E-02	2.656E-02
CS-134	#B	1.7860E-02	1.7910E-02	1.2753E-02	1.2797E-02	5.492E-02
CS-137		4.0885E-02	4.0893E-02	3.7612E-02	3.7689E-02	
CE-139	#A	-1.4740E-03	-1.4967E-03	3.0153E-02	3.0154E-02	3.015E-02
EU-152	#B	1.4331E-02	1.4338E-02	8.7367E-02	8.7371E-02	9.698E-02
EU-154	#B	-6.0194E-03	-6.0235E-03	6.8224E-02	6.8225E-02	7.058E-02
EU-155	#	1.5829E-01	1.5848E-01	1.0944E-01	1.0979E-01	1.174E-01
HG-203	#B	-9.2116E-03	-9.6370E-03	2.9105E-02	2.9110E-02	2.867E-02
TL-208		2.6699E-01	2.6699E-01	5.0741E-02	5.3134E-02	
PB-212	#	6.7421E-01	6.7421E-01	8.1394E-02	9.0612E-02	6.662E-02
PB-214	#	4.2319E-01	4.2319E-01	6.9366E-02	7.3731E-02	5.704E-02
BI-212		6.4505E-01	6.4505E-01	3.9521E-01	3.9705E-01	
BI-214		4.3411E-01	4.3411E-01	9.4457E-02	9.7875E-02	
RA-224	#	8.0906E-01	8.0906E-01	7.4552E-01	7.4705E-01	8.055E-01
RA-226		1.1068E+00	1.1068E+00	7.6878E-01	7.7156E-01	
AC-228		8.1026E-01	8.1026E-01	1.5124E-01	1.5863E-01	
TH-227	#B	-1.8971E-01	-1.8971E-01	2.6986E-01	2.7009E-01	2.936E-01

PA-234 #B	-4.0942E-02	-4.0942E-02	1.1510E-01	1.1512E-01	1.271E-01

TH-234 #B	8.3897E-01	8.3897E-01	8.0531E-01	8.0665E-01	1.505E+00
AM-241 #A	5.4247E-03	5.4247E-03	1.7822E-01	1.7822E-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 (269.7 to 2000.1 keV) 1.8753050E+01 pCi/gm
Total Decayed Activity (269.7 to 2000.1 keV) 1.8758116E+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_29JUN2006_1623.An1

Sample description
FSS-OOL-10-03-034-F-B

Spectrum Filename: C:\GammaVision\Spectra\107F_29JUN2006_1623.An1

Acquisition information

Start time:	29-Jun-2006 16:23:12
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:	1.7610E+03
Activity scaling factor:	1.0000E+06/(1.0000E+00* 1.7610E+03) = 5.6786E+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	26-Jun-2006 16:33:00
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. 24 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.1472

***** 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	385.	11.91	1.18	2.849E-02	74.81	9.600	1.079E+00	PB212
77.13	654.	5.88	1.18	2.957E-02	77.11	10.700	1.673E+00	PB214
					77.11	17.500	1.030E+00	PB212
86.66	204.	20.77	1.19	3.290E-02	86.45	32.740	1.460E-01	EU155
90.47	99.	39.80	1.19	3.387E-02				
93.40	219.	18.89	1.19	3.451E-02	92.38	2.570	1.833E+00	TH234
					92.80	3.000	1.479E+00	TH234
129.60	144.	36.49	1.05	3.819E-02				
129.60	144.	36.49	1.05	3.819E-02	131.28	20.000	1.445E-01	PA234
163.61	86.	39.82	1.18	3.753E-02				
185.97	269.	18.43	1.01	3.610E-02	185.99	3.280	1.742E+00	RA226
209.57	211.	18.52	0.88	3.426E-02				
238.81	1667.	2.96	1.30	3.188E-02	238.63	43.100	9.217E-01	PB212
241.51	259.	18.53	1.30	3.166E-02	241.00	3.900	1.592E+00	RA224
					241.92	7.470	8.356E-01	PB214
270.58	180.	21.07	1.62	2.942E-02				
295.38	345.	8.04	1.34	2.767E-02	295.22	19.200	4.916E-01	PB214
300.70	98.	22.35	1.34	2.732E-02				
328.23	84.	25.00	1.36	2.559E-02				
338.63	452.	10.64	1.54	2.499E-02	338.40	12.010	1.148E+00	AC228
352.12	637.	6.33	1.54	2.425E-02	351.99	37.100	5.386E-01	PB214
409.76	68.	28.47	1.46	2.153E-02				
463.48	122.	23.01	1.61	1.953E-02				
463.48	122.	23.01	1.61	1.953E-02	463.51	10.000	4.693E-01	SB125
510.82	275.	10.53	1.87	1.808E-02	510.72	22.500	4.552E-01	TL208
583.29	641.	5.54	1.60	1.629E-02	583.14	86.000	3.488E-01	TL208
609.51	446.	7.63	1.61	1.574E-02	609.32	46.090	4.666E-01	BI214

728.06	165.	13.57	1.64	1.373E-02	727.17	11.800	7.747E-01	BI212
795.14	103.	20.83	1.76	1.285E-02				
795.14	103.	20.83	1.76	1.285E-02	795.76	85.400	7.184E-02	CS134
911.46	377.	7.48	1.64	1.160E-02	911.07	29.000	8.488E-01	AC228
968.02	369.	7.29	1.93	1.110E-02	968.90	17.460	1.454E+00	AC228
1119.74	142.	19.83	2.02	9.973E-03	1120.28	15.040	7.232E-01	BI214
1461.20	1971.	2.29	2.18	8.189E-03	1460.75	10.700	1.722E+01	K40
1765.01	91.	13.31	1.66	7.082E-03	1764.51	15.920	6.104E-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	
180.61	90.50	732.	99.	0.050	119.41	1.189	PB-214	lD
185.98	93.43	786.	186.	0.093	67.51	1.191	U-235	D
258.86	129.60	1047.	144.	0.072	109.48	1.046	AC-228	l
418.77	209.57	575.	211.	0.106	55.56	0.883	AC-228	
540.78	270.58	448.	180.	0.090	63.20	1.616	AC-228	s
600.79	300.58	367.	96.	0.048	103.26	0.802	PB-212	sM
656.08	328.17	180.	84.	0.042	74.99	1.361	AC-228	D
819.13	409.76	145.	68.	0.034	85.42	1.463	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	881.	385.	0.192	35.74	1.178D
PB-212	153.89	77.11	887.	654.	0.327	17.64	1.179A
EU-155	174.10	87.22	1790.	166.	0.083	110.86	1.500s
TH-234	185.81	93.07	1541.	193.	0.097	80.34	1.500s
RA-226	371.58	185.97	809.	269.	0.134	55.28	1.011s
TH-227	471.54	235.96	1340.	-172.	-0.086	93.04	1.500s
PB-212	476.89	238.63	330.	1650.	0.825	8.62	1.297D
PB-214	483.47	241.92	631.	165.	0.082	49.71	1.299A
PB-214	590.15	295.26	382.	365.	0.183	30.25	1.470
AC-228	676.88	338.63	482.	449.	0.225	31.92	1.538
PB-214	703.85	352.12	324.	632.	0.316	19.00	1.542
SB-125	926.37	463.39	205.	89.	0.045	72.75	1.500s
TL-208	1021.24	510.82	222.	241.	0.121	31.60	1.869s
TL-208	1166.17	583.29	193.	637.	0.318	16.63	1.595
BI-214	1218.60	609.51	207.	441.	0.221	22.88	1.608
Ag-108M	1224.25	612.33	274.	-61.	-0.030	121.49	1.561s
BI-212	1455.70	728.06	113.	164.	0.082	40.70	1.640s
CS-134	1589.82	795.13	102.	71.	0.035	69.51	1.684s
AC-228	1822.49	911.46	127.	372.	0.186	22.43	1.635
AC-228	1935.60	968.02	101.	367.	0.183	21.88	1.930s
BI-214	2239.05	1119.74	153.	141.	0.071	59.48	2.024s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
K-40	2922.01	1461.20	21.	1966.	0.983	6.87	2.180
BI-214	3529.68	1765.01	12.	90.	0.045	39.92	1.662

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		-3.5557E-03					
			477.56	-3.556E-03	&(	2.489E-01 7.23E-02	G
K-40		1.7216E+01					
			1460.75	1.722E+01	(P	2.095E-01 3.95E-01	G
MN-54		1.9822E-02					
			834.81	1.982E-02	%(P	3.167E-02 9.74E-03	G
CO-57		-1.1077E-02					
			122.07	-1.108E-02	%(P	3.623E-02 1.09E-02	G K
			136.43	-4.248E-03	% P	2.971E-01 8.86E-02	G
CO-60		4.5095E-03					
			1332.51	4.510E-03	%(P	3.210E-02 9.08E-03	G K
			1173.23	8.751E-03	% P	4.284E-02 1.25E-02	G K
Sr-85		-2.2046E-02					
			514.00	-2.205E-02	&(	4.071E-02 1.24E-02	G
Kr-85		-5.2277E+02					
			513.99	-5.228E+02	&(P	9.138E+02 2.77E+02	G
Y-88		-9.3316E-04					
			1836.01	-9.332E-04	%(P	2.620E-02 6.85E-03	G K
			898.02	-9.984E-03	% P	3.589E-02 1.05E-02	G
NB-94		9.0500E-03					
			871.10	9.050E-03	&(P	2.287E-02 6.85E-03	G K
			702.50	-4.862E-05	& P	3.240E-02 9.38E-03	G K
Ag-108M		1.8416E-02					
			722.95	1.842E-02	&(	2.827E-02 8.75E-03	G K
			614.37	-3.307E-02	&	4.333E-02 1.34E-02	G
			433.93	-6.413E-03	& P	3.001E-02 8.87E-03	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CD-109	-2.1526E-03						
		88.04	-2.153E-03	%(P	1.290E+00	3.86E-01	G
SN-113	-5.1247E-03						
		391.71	-5.125E-03	%(P	4.053E-02	1.19E-02	G K
		255.04	-1.896E-02	%	1.385E+00	4.11E-01	G
SB-125	6.8499E-02						
		427.95	-2.678E-02	%(P	9.413E-02	2.80E-02	G K
		600.77	4.599E-02	% P	1.413E-01	4.21E-02	G
		636.15	9.841E-02	% P	2.133E-01	6.45E-02	G
		463.51	3.505E-01	(P	2.733E-01	8.77E-02	G
		176.29	8.552E-03	% P	4.301E-01	1.28E-01	G
I-131	6.0752E-03						
		364.48	6.075E-03	%(	4.056E-02	1.20E-02	G K
		636.97	2.475E-01	%	3.714E-01	1.15E-01	G
		284.29	6.139E-03	%	6.222E-01	1.84E-01	G
CS-134	-1.6841E-02						
		604.66	-1.684E-02	&(P	3.552E-02	1.07E-02	G K
		795.76	4.981E-02	+ P	3.494E-02	1.16E-02	G
		569.29	2.014E-04	&	1.874E-01	5.44E-02	G
		801.84	-8.017E-02	% P	3.894E-01	1.15E-01	G
CS-137	-3.7391E-04						
		661.62	-3.739E-04	&(P	3.831E-02	1.11E-02	G
CE-139	-6.7814E-03						
		165.85	-6.781E-03	%(P	3.819E-02	1.15E-02	G
EU-152	-3.4064E-02						
		121.78	-3.406E-02	%(P	1.091E-01	3.29E-02	G K
		344.30	-2.014E-02	% P	1.019E-01	3.03E-02	G
		1408.08	5.803E-02	% P	1.162E-01	3.53E-02	G
		964.00	-1.033E-01	& P	3.615E-01	1.08E-01	G
		1112.07	-2.298E-02	& P	2.854E-01	8.25E-02	G
		778.90	-2.772E-03	% P	2.561E-01	7.39E-02	G
EU-154	-2.7126E-02						
		123.10	-2.713E-02	%(P	7.179E-02	2.17E-02	G K
		1274.80	-8.097E-03	% P	1.153E-01	3.32E-02	G
		723.30	-6.369E-02	& P	2.199E-01	6.57E-02	G
		1004.80	7.933E-03	& P	1.943E-01	5.59E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
EU-155	1.1835E-01						
		86.45	1.183E-01	*(	1.428E-01	4.37E-02	G K
		105.31	6.547E-02	% P	1.569E-01	4.75E-02	G
HG-203	-1.2395E-03						
		279.17	-1.239E-03	&(P	3.188E-02	9.39E-03	G K
		72.87	-2.976E-01	% P	1.104E+00	3.33E-01	G
		70.83	-1.129E+00	&	1.928E+00	5.86E-01	G
		82.50	-1.107E+00	%	2.269E+00	6.88E-01	G
TL-208	3.4885E-01						
		583.14	3.488E-01	(P	3.696E-02	1.95E-02	G
		510.72	4.552E-01	+ P	1.360E-01	5.46E-02	G
PB-212	9.7000E-01						
		238.63	9.212E-01	(P	4.875E-02	2.67E-02	G K
							Energy duplication
		77.11	9.700E-01	}	2.098E-01	5.70E-02	G
		74.81	1.079E+00	(P	3.957E-01	1.30E-01	G
PB-214	5.3505E-01						
		351.99	5.386E-01	(P	7.387E-02	3.44E-02	G K
		295.22	5.272E-01	(P	1.354E-01	5.38E-02	G
							Energy duplication
		77.11	8.262E-02	} P	4.696E-01	1.30E-01	G
		241.92	5.351E-01	} P	3.891E-01	8.87E-02	G
BI-212	7.7470E-01						
		727.17	7.747E-01	*(P	2.475E-01	1.06E-01	G K
		1620.56	1.216E-01	% P	9.462E-01	2.64E-01	G
		785.42	6.923E-01	% P	1.554E+00	4.68E-01	G
BI-214	4.6661E-01						
		609.32	4.666E-01	(P	7.375E-02	3.59E-02	G K
		1764.51	6.104E-01	+ P	1.296E-01	8.20E-02	G
		1120.28	7.232E-01	+ P	3.086E-01	1.44E-01	G
RA-224	8.0098E-01						
							Derived Ave Activity
		241.00	8.010E-01	}(P	1.213E+00	3.81E-01	G
RA-226	1.7420E+00						
		185.99	1.742E+00	*(	8.766E-01	3.21E-01	G
AC-228	8.4884E-01						
		911.07	8.488E-01	(P	1.257E-01	6.42E-02	G K
		968.90	1.454E+00	+ P	1.963E-01	1.07E-01	G
		338.40	1.148E+00	+ P	2.683E-01	1.23E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TH-227	-3.6807E-01						
		236.00	-3.681E-01	?(P	3.699E-01	1.14E-01	G K
		256.25	1.045E-01	% P	3.999E-01	1.20E-01	G
PA-234	7.8674E-02						
		98.44	7.867E-02	%(	1.458E-01	4.43E-02	G K
		946.00	2.410E-02	&	1.609E-01	4.69E-02	G
		131.28	8.165E-02	&	1.457E-01	4.43E-02	G
		94.67	2.431E-02	%	2.136E-01	6.39E-02	G
		883.24	6.240E-02	%	2.147E-01	6.34E-02	G
		926.70	-3.655E-02	%	3.183E-01	9.28E-02	G
		569.26	-1.842E-03	&	2.780E-01	8.07E-02	G
TH-234	8.1327E-01						
		63.29	3.326E-01	%(P	1.789E+00	5.37E-01	G K
		92.80	1.438E+00	*(P	1.381E+00	4.24E-01	G
		92.38	-2.363E-01	% P	1.658E+00	4.96E-01	G
AM-241	-2.6691E-02						
		59.54	-2.669E-02	%(P	2.051E-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	-3.4202E-03	-3.5557E-03	2.1686E-01	2.1686E-01	2.394E-01
K-40		1.7216E+01	1.7216E+01	1.1859E+00	1.5621E+00	
MN-54	#A	1.9691E-02	1.9822E-02	2.9234E-02	2.9258E-02	3.146E-02
CO-57	#B	-1.0992E-02	-1.1077E-02	3.3145E-02	3.3151E-02	3.595E-02
CO-60	#B	4.5047E-03	4.5095E-03	2.7244E-02	2.7245E-02	3.207E-02
Sr-85	#A	-2.1351E-02	-2.2046E-02	3.7172E-02	3.7195E-02	3.943E-02
Kr-85	#A	-5.2276E+02	-5.2277E+02	9.3118E+02	9.3169E+02	9.138E+02
Y-88	#B	-9.1517E-04	-9.3316E-04	3.3437E-02	3.3437E-02	2.569E-02
NB-94	#B	9.0500E-03	9.0500E-03	2.0541E-02	2.0548E-02	2.287E-02
Ag-108M	#B	1.8415E-02	1.8416E-02	2.6241E-02	2.6263E-02	2.827E-02
CD-109	#A	-2.1427E-03	-2.1526E-03	2.4274E+01	2.4274E+01	1.284E+00
SN-113	#B	-5.0331E-03	-5.1247E-03	5.2789E-02	5.2789E-02	3.981E-02
SB-125	#B	6.8358E-02	6.8499E-02	5.1409E-02	5.1568E-02	9.394E-02
I-131	#B	4.6934E-03	6.0752E-03	3.6047E-02	3.6049E-02	3.134E-02
CS-134	#B	-1.6795E-02	-1.6841E-02	3.3263E-02	3.3278E-02	3.542E-02
CS-137	#A	-3.7384E-04	-3.7391E-04	4.6959E-02	4.6959E-02	3.830E-02
CE-139	#A	-6.6798E-03	-6.7814E-03	3.5265E-02	3.5267E-02	3.762E-02
EU-152	#B	-3.4049E-02	-3.4064E-02	9.9210E-02	9.9228E-02	1.090E-01
EU-154	#B	-2.7108E-02	-2.7126E-02	6.6350E-02	6.6367E-02	7.174E-02
EU-155	#A	1.1821E-01	1.1835E-01	1.3120E-01	1.3136E-01	1.427E-01
HG-203	#B	-1.1855E-03	-1.2395E-03	5.9488E-02	5.9488E-02	3.049E-02
TL-208		3.4885E-01	3.4885E-01	5.8418E-02	6.1945E-02	
PB-212		9.7000E-01	9.7000E-01	8.4460E-02	1.0206E-01	
PB-214		5.3505E-01	5.3505E-01	1.0247E-01	1.0724E-01	
BI-212	#	7.7470E-01	7.7470E-01	3.1776E-01	3.2103E-01	
BI-214		4.6661E-01	4.6661E-01	1.0780E-01	1.1127E-01	
RA-224	A	8.0098E-01	8.0098E-01	1.1152E+00	1.1162E+00	
RA-226	#	1.7420E+00	1.7420E+00	9.6302E-01	9.6850E-01	
AC-228		8.4884E-01	8.4884E-01	1.9255E-01	1.9897E-01	
TH-227	#A	-3.6807E-01	-3.6807E-01	3.4300E-01	3.4369E-01	3.699E-01
PA-234	#B	7.8674E-02	7.8674E-02	1.3296E-01	1.3303E-01	1.458E-01
TH-234	#B	8.1327E-01	8.1327E-01	7.2002E-01	7.2143E-01	1.789E+00
AM-241	#A	-2.6691E-02	-2.6691E-02	1.9625E-01	1.9625E-01	2.051E-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_29JUN2006_1623.An1

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

Total Activity (338.2 to 2000.1 keV) 2.3703041E+01 pCi/gm
Total Decayed Activity (338.2 to 2000.1 keV) 2.3703049E+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_29JUN2006_1700.An1

Sample description
FSS-OOL-10-03-025-F-B

Spectrum Filename: C:\GammaVision\Spectra\107F_29JUN2006_1700.An1

Acquisition information
Start time: 29-Jun-2006 17:00:35
Live time: 2000
Real time: 2003
Dead time: 0.16 %
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: 2.1350E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 2.1350E+03) =
4.6838E+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	26-Jun-2006 15:55:00
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. 26 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.1925

***** 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	422.	11.13	1.18	2.849E-02	74.81	9.600	9.759E-01	PB212
77.11	546.	7.58	1.18	2.957E-02	77.11	17.500	8.844E-01	PB212
					77.11	10.700	1.437E+00	PB214
84.20	125.	31.69	1.18	3.217E-02				
87.13	264.	15.88	1.19	3.302E-02	86.45	32.740	1.558E-01	EU155
					88.04	3.790	1.332E+00	CD109
90.20	217.	19.14	1.19	3.379E-02				
92.89	257.	16.79	1.19	3.440E-02	92.38	2.570	1.786E+00	TH234
					92.80	3.000	1.454E+00	TH234
186.34	278.	17.36	2.15	3.608E-02	185.99	3.280	1.483E+00	RA226
209.12	155.	29.76	0.98	3.430E-02				
238.79	1595.	3.09	1.30	3.188E-02	238.63	43.100	7.271E-01	PB212
241.56	304.	15.76	1.30	3.166E-02	241.00	3.900	1.543E+00	RA224
					241.92	7.470	8.096E-01	PB214
270.43	129.	31.16	1.60	2.943E-02				
277.07	104.	33.09	1.50	2.894E-02				
295.46	380.	7.80	1.34	2.766E-02	295.22	19.200	4.468E-01	PB214
300.42	81.	29.57	1.34	2.733E-02				
328.35	110.	23.49	1.51	2.558E-02				
338.51	391.	10.82	1.40	2.500E-02	338.40	12.010	8.178E-01	AC228
352.09	729.	5.68	1.54	2.425E-02	351.99	37.100	5.090E-01	PB214
463.15	121.	26.82	1.61	1.954E-02				
463.15	121.	26.82	1.61	1.954E-02	463.51	10.000	3.842E-01	SB125
511.32	259.	12.83	1.90	1.806E-02	510.72	22.500	3.501E-01	TL208
583.42	600.	5.95	1.71	1.628E-02	583.14	86.000	2.692E-01	TL208
609.51	539.	6.80	1.54	1.574E-02	609.32	46.090	4.664E-01	BI214
727.37	179.	17.52	2.54	1.374E-02	727.17	11.800	6.936E-01	BI212

785.93	46.	30.80	0.87	1.297E-02	785.42	2.000	1.111E+00	BI212
795.18	55.	31.50	1.68	1.284E-02	795.76	85.400	3.175E-02	CS134
860.30	115.	17.99	1.30	1.211E-02				
911.51	400.	7.48	1.50	1.160E-02	911.07	29.000	7.445E-01	AC228
964.72	95.	16.70	1.80	1.113E-02				
969.12	218.	8.87	1.80	1.109E-02	968.90	17.460	7.038E-01	AC228
1120.10	135.	21.26	1.28	9.971E-03	1120.28	15.040	5.665E-01	BI214
1461.20	2194.	2.19	2.12	8.189E-03	1460.75	10.700	1.581E+01	K40
1621.33	32.	23.84	1.36	7.569E-03	1620.56	2.750	9.730E-01	BI212

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
1764.90	86.	12.30	1.63	7.084E-03	1764.51	15.920	4.810E-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	
168.06	84.17	719.	125.	0.062	95.08	1.185	TA-182	D
173.93	87.10	750.	264.	0.132	47.65	1.187	BI-207	D
180.06	90.17	757.	217.	0.109	57.41	1.189	PB-214	D
185.44	92.85	800.	257.	0.128	50.36	1.191	TH-234	D
417.87	209.12	789.	155.	0.078	89.27	0.979	AC-228	
540.49	270.43	531.	129.	0.064	93.48	1.597	AC-228	s
600.44	300.41	417.	82.	0.041	122.68	1.363	PB-212	M
656.33	328.35	256.	110.	0.055	70.48	1.513	RH-106M	
1720.16	860.30	94.	115.	0.057	53.98	1.301	TL-208	s
1929.42	964.74	77.	95.	0.048	49.56	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
HG-203	145.95	73.14	2168.	-225.	-0.112	90.25	1.500
PB-212	149.29	74.81	913.	422.	0.211	33.39	1.178D
PB-212	153.89	77.11	964.	546.	0.273	22.75	1.179A
EU-155	173.96	87.15	1940.	200.	0.100	96.00	1.500
TH-234	185.82	93.08	1874.	226.	0.113	80.65	1.500
TH-234	185.79	93.06	1813.	220.	0.110	77.44	1.500
RA-226	372.33	186.34	818.	278.	0.139	52.09	2.151s
PB-212	476.89	238.63	366.	1567.	0.783	9.06	1.297D
PB-214	483.47	241.92	665.	185.	0.093	47.34	1.299A
PB-214	590.51	295.45	519.	377.	0.188	33.60	1.379
AC-228	676.64	338.51	441.	388.	0.194	32.46	1.402
PB-214	703.79	352.09	345.	724.	0.362	17.05	1.538
SB-125	926.01	463.21	221.	86.	0.043	77.12	1.500s
TL-208	1022.24	511.32	289.	225.	0.113	38.48	1.901s
TL-208	1166.42	583.42	209.	596.	0.298	17.85	1.711
BI-214	1218.59	609.51	234.	535.	0.267	20.40	1.537
BI-212	1454.32	727.37	202.	178.	0.089	52.55	2.543s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
BI-212	1571.43	785.93	74.	46.	0.023	92.41	0.867s
CS-134	1589.93	795.18	125.	55.	0.027	94.50	1.684
AC-228	1822.58	911.51	142.	396.	0.198	22.44	1.495
AC-228	1937.36	968.90	90.	214.	0.107	27.41	1.799D
BI-214	2239.76	1120.10	178.	134.	0.067	63.78	1.284s
K-40	2921.99	1461.20	33.	2189.	1.095	6.57	2.120
BI-212	3242.29	1621.33	10.	32.	0.016	71.53	1.362s
BI-214	3529.44	1764.90	7.	86.	0.043	36.90	1.629s

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		5.4079E-02					
			477.56	5.408E-02	%(	2.277E-01 6.77E-02 G	
K-40		1.5811E+01					
			1460.75	1.581E+01	(P	2.118E-01 3.47E-01 G	
MN-54		-8.7896E-03					
			834.81	-8.790E-03	&(P	2.989E-02 8.89E-03 G	
CO-57		-3.1794E-03					
			122.07	-3.179E-03	%(P	3.405E-02 1.02E-02 G K	
			136.43	-4.942E-02	% P	2.803E-01 8.42E-02 G	
CO-60		6.1028E-03					
			1332.51	6.103E-03	%(P	2.543E-02 7.29E-03 G K	
			1173.23	9.053E-03	% P	3.948E-02 1.16E-02 G K	
Sr-85		-1.3325E-02					
			514.00	-1.332E-02	&(	3.130E-02 9.46E-03 G	
Kr-85		-3.2226E+02					
			513.99	-3.223E+02	&(P	7.026E+02 2.11E+02 G	
Y-88		1.2511E-03					
			1836.01	1.251E-03	&(P	1.623E-02 4.20E-03 G K	
			898.02	-9.054E-04	% P	3.707E-02 1.07E-02 G	
NB-94		2.0947E-03					
			871.10	2.095E-03	%(P	2.355E-02 6.79E-03 G K	
			702.50	8.373E-03	% P	2.891E-02 8.62E-03 G K	

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
Ag-108M	1.3779E-02						
		722.95	1.378E-02	%(	2.135E-02	6.61E-03	G K
		614.37	-2.597E-02	%	3.564E-02	1.10E-02	G
		433.93	-5.981E-03	% P	2.597E-02	7.70E-03	G
CD-109	-1.2927E-01						
		88.04	-1.293E-01	&(P	1.101E+00	3.31E-01	G
SN-113	9.7260E-04						
		391.71	9.726E-04	&(P	2.924E-02	8.51E-03	G K
		255.04	-2.407E-01	&	1.246E+00	3.73E-01	G
SB-125	6.4303E-02						
		427.95	-8.779E-03	&(P	8.025E-02	2.36E-02	G K
		600.77	-3.977E-03	% P	1.443E-01	4.19E-02	G
		636.15	4.057E-02	% P	1.849E-01	5.44E-02	G
		463.51	2.806E-01	@(P	2.339E-01	7.45E-02	G
		176.29	5.221E-02	% P	4.315E-01	1.29E-01	G
I-131	7.2022E-03						
		364.48	7.202E-03	&(	3.555E-02	1.06E-02	G K
		636.97	-8.893E-02	%	4.246E-01	1.25E-01	G
		284.29	-8.337E-02	%	5.021E-01	1.50E-01	G
CS-134	1.4656E-02						
		604.66	-3.042E-04	%(P	2.612E-02	7.58E-03	G K
		795.76	3.175E-02	(P	3.173E-02	1.01E-02	G
		569.29	0.000E+00	&	1.631E-01	4.75E-02	G
		801.84	3.506E-02	& P	3.174E-01	9.27E-02	G
CS-137	1.3526E-02						
		661.62	1.353E-02	%(P	2.999E-02	9.02E-03	G
CE-139	4.8367E-03						
		165.85	4.837E-03	&(P	3.471E-02	1.04E-02	G
EU-152	-7.1118E-03						
		121.78	-7.112E-03	%(P	1.014E-01	3.04E-02	G K
		344.30	1.553E-02	& P	7.672E-02	2.28E-02	G
		1408.08	2.905E-02	& P	1.006E-01	2.93E-02	G
		964.00	1.752E-02	& P	3.734E-01	1.10E-01	G
		1112.07	3.264E-02	% P	2.491E-01	7.27E-02	G
		778.90	-3.906E-03	% P	2.215E-01	6.41E-02	G
EU-154	-6.1834E-04						
		123.10	-6.183E-04	%(P	6.658E-02	1.99E-02	G K
		1274.80	2.540E-02	% P	1.040E-01	3.07E-02	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          723.30-1.437E-02 & P 1.497E-01 4.38E-02 G
                         1004.80-3.766E-02 & P 1.710E-01 5.04E-02 G

EU-155       1.1766E-01
                           86.45 1.177E-01  (  1.226E-01 3.76E-02 G K
                          105.31 1.928E-02 % P 1.472E-01 4.42E-02 G

HG-203      -4.5899E-03
                          279.17-4.590E-03 &(P 3.371E-02 1.00E-02 G K
                           72.87-4.746E-01 & P 9.519E-01 2.89E-01 G
                           70.83-1.609E+00 +   1.575E+00 4.84E-01 G
                           82.50-8.856E-01 %   1.928E+00 5.84E-01 G

TL-208       2.6917E-01
                          583.14 2.692E-01  (P 3.168E-02 1.61E-02 G
                          510.72 3.501E-01 + P 1.275E-01 5.17E-02 G

PB-212       7.2139E-01
                          238.63 7.214E-01  (P 4.231E-02 2.20E-02 G K
                                                          Energy duplication
                           77.11 6.673E-01 }   1.802E-01 5.06E-02 G
                           74.81 9.759E-01 + P 3.321E-01 1.10E-01 G

PB-214       4.9631E-01
                          351.99 5.090E-01  (P 6.280E-02 2.91E-02 G K
                          295.22 4.487E-01  (P 1.297E-01 5.09E-02 G
                                                          Energy duplication
                           77.11 1.862E-01 } P 3.981E-01 1.10E-01 G
                          241.92 4.963E-01 } P 3.291E-01 7.83E-02 G

BI-212       7.9055E-01
                          727.17 6.936E-01 *(P 2.693E-01 1.22E-01 G K
                         1620.56 9.730E-01  (P 5.306E-01 2.36E-01 G
                          785.42 1.111E+00  (P 1.048E+00 3.52E-01 G

BI-214       4.8899E-01
                          609.32 4.664E-01  (P 6.459E-02 3.20E-02 G K
                         1764.51 4.810E-01  (P 8.586E-02 5.98E-02 G
                         1120.28 5.665E-01 @(P 2.737E-01 1.21E-01 G

RA-224       7.3621E-01
                                                          Derived Ave Activity
                          241.00 7.362E-01 }(P 9.986E-01 3.16E-01 G

RA-226       1.4833E+00
                          185.99 1.483E+00 *(  7.267E-01 2.58E-01 G

AC-228       7.4641E-01
                          911.07 7.445E-01  (P 1.095E-01 5.63E-02 G K
                          968.90 7.004E-01  (P 1.531E-01 6.47E-02 G
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 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          338.40 8.178E-01  (P 2.120E-01 8.92E-02 G

TH-227      -2.1013E-01
                          236.00-2.101E-01 %(P 3.152E-01 9.61E-02 G K
                          256.25-1.146E-01 & P 3.726E-01 1.12E-01 G

PA-234      -1.6976E-02
                           98.44-1.698E-02 %(  1.245E-01 3.74E-02 G K
                          946.00-3.992E-02 &   1.462E-01 4.34E-02 G
                          131.28 3.805E-02 %   1.523E-01 4.59E-02 G
                           94.67-8.900E-02 %   2.442E-01 7.38E-02 G
                          883.24-3.894E-02 %   2.256E-01 6.61E-02 G
                          926.70-4.670E-04 %   2.430E-01 6.96E-02 G
                          569.26 0.000E+00 &   2.413E-01 7.02E-02 G

TH-234       1.1443E+00
                           63.29 6.695E-01 %(P 1.576E+00 4.76E-01 G K
                           92.80 1.349E+00  (P 1.234E+00 3.80E-01 G
                           92.38 1.625E+00  (P 1.468E+00 4.52E-01 G

AM-241      -1.1856E-02
                           59.54-1.186E-02 %(P 1.722E-01 5.14E-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
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	5.1983E-02	5.4079E-02	2.0310E-01	2.0313E-01	2.189E-01
K-40		1.5811E+01	1.5811E+01	1.0410E+00	1.3984E+00	
MN-54	#A	-8.7304E-03	-8.7896E-03	2.8034E-02	2.8039E-02	2.969E-02
CO-57	#B	-3.1547E-03	-3.1794E-03	3.1660E-02	3.1660E-02	3.378E-02
CO-60	#B	6.0961E-03	6.1028E-03	2.1881E-02	2.1884E-02	2.540E-02
Sr-85	#A	-1.2898E-02	-1.3325E-02	2.8375E-02	2.8386E-02	3.029E-02
Kr-85	#A	-3.2225E+02	-3.2226E+02	7.3835E+02	7.3860E+02	7.026E+02
Y-88	#B	1.2266E-03	1.2511E-03	1.2607E-02	1.2607E-02	1.591E-02
NB-94	#B	2.0947E-03	2.0947E-03	2.0376E-02	2.0376E-02	2.355E-02
Ag-108M	#B	1.3779E-02	1.3779E-02	1.9842E-02	1.9859E-02	2.135E-02
CD-109	#A	-1.2867E-01	-1.2927E-01	1.0178E+00	1.0178E+00	1.096E+00
SN-113	#B	9.5492E-04	9.7260E-04	2.5519E-02	2.5519E-02	2.870E-02
SB-125	#B	6.4169E-02	6.4303E-02	5.1207E-02	5.1347E-02	8.008E-02
I-131	#B	5.5390E-03	7.2022E-03	3.1744E-02	3.1747E-02	2.734E-02
CS-134	#B	1.4615E-02	1.4656E-02	1.3983E-02	1.4010E-02	2.605E-02
CS-137	#A	1.3524E-02	1.3526E-02	2.7058E-02	2.7070E-02	2.998E-02
CE-139	#A	4.7630E-03	4.8367E-03	3.1224E-02	3.1225E-02	3.419E-02
EU-152	#B	-7.1086E-03	-7.1118E-03	9.3102E-02	9.3103E-02	1.013E-01
EU-154	#B	-6.1792E-04	-6.1834E-04	1.2676E-01	1.2676E-01	6.654E-02
EU-155	#A	1.1752E-01	1.1766E-01	1.1294E-01	1.1313E-01	1.224E-01
HG-203	#B	-4.3866E-03	-4.5899E-03	3.5354E-02	3.5355E-02	3.221E-02
TL-208		2.6917E-01	2.6917E-01	4.8414E-02	5.0957E-02	
PB-212		7.2139E-01	7.2139E-01	6.6008E-02	7.8564E-02	
PB-214		4.9631E-01	4.9631E-01	8.5195E-02	9.0097E-02	
BI-212		7.9055E-01	7.9055E-01	3.4460E-01	3.4775E-01	
BI-214		4.8899E-01	4.8899E-01	1.0059E-01	1.0465E-01	
RA-224	A	7.3621E-01	7.3621E-01	9.2040E-01	9.2143E-01	
RA-226	#	1.4833E+00	1.4833E+00	7.7260E-01	7.7755E-01	
AC-228		7.4641E-01	7.4641E-01	1.2069E-01	1.2849E-01	
TH-227	#B	-2.1013E-01	-2.1013E-01	2.8975E-01	2.9002E-01	3.152E-01
PA-234	#B	-1.6976E-02	-1.6976E-02	1.1209E-01	1.1209E-01	1.245E-01
TH-234	#B	1.1443E+00	1.1443E+00	9.3141E-01	9.3357E-01	1.576E+00
AM-241	#A	-1.1855E-02	-1.1856E-02	1.7354E-01	1.7355E-01	1.721E-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) 2.1543772E+01 pCi/gm
Total Decayed Activity (1120.2 to 2000.1 keV) 2.1543777E+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_29JUN2006_1737.An1

Sample description
FSS-OOL-10-03-002-F

Spectrum Filename: C:\GammaVision\Spectra\107F_29JUN2006_1737.An1

Acquisition information
Start time: 29-Jun-2006 17:37:40
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: 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	26-Jun-2006 16:27:00
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. 25 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.2445

***** 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	379.	12.66	1.18	2.842E-02	70.83	3.520	2.875E+00	HG203
					74.81	9.600	9.185E-01	PB212
77.15	617.	8.35	1.18	2.958E-02	77.11	17.500	7.987E-01	PB212
					77.11	10.700	1.296E+00	PB214
87.14	320.	13.31	1.19	3.301E-02	86.45	32.740	1.998E-01	EU155
					88.04	3.790	1.708E+00	CD109
90.23	198.	20.52	1.19	3.379E-02				
93.16	257.	16.05	1.19	3.445E-02	92.38	2.570	1.895E+00	TH234
					92.80	3.000	1.543E+00	TH234
155.13	117.	41.02	0.95	3.792E-02				
185.64	315.	18.33	1.32	3.613E-02	185.99	3.280	1.780E+00	RA226
209.85	214.	21.20	1.65	3.424E-02				
238.79	1644.	3.03	1.30	3.188E-02	238.63	43.100	7.932E-01	PB212
242.13	233.	13.59	1.30	3.161E-02	241.00	3.900	1.250E+00	RA224
					241.92	7.470	6.564E-01	PB214
270.37	140.	24.48	1.53	2.943E-02				
277.81	95.	37.59	1.16	2.889E-02				
277.81	95.	37.59	1.16	2.889E-02	279.17	81.500	PBC<MDA	HG203
295.44	337.	8.56	1.34	2.767E-02	295.22	19.200	4.195E-01	PB214
300.32	98.	24.31	1.34	2.734E-02				
328.26	139.	26.27	1.07	2.559E-02				
338.46	368.	8.42	1.47	2.500E-02	338.40	12.010	8.126E-01	AC228
352.12	652.	6.31	1.43	2.425E-02	351.99	37.100	4.813E-01	PB214
409.82	101.	24.88	1.90	2.153E-02				
463.26	71.	30.49	1.50	1.953E-02	463.51	10.000	PBC<MDA	SB125
510.96	278.	10.88	1.59	1.807E-02	510.72	22.500	4.025E-01	TL208
583.37	583.	5.84	1.73	1.628E-02	583.14	86.000	2.766E-01	TL208

609.59	480.	7.09	1.50	1.574E-02	609.32	46.090	4.388E-01	BI214
727.23	114.	16.52	1.61	1.374E-02	727.17	11.800	4.663E-01	BI212
795.48	95.	22.04	1.20	1.284E-02				
795.48	95.	22.04	1.20	1.284E-02	795.76	85.400	5.798E-02	CS134
911.60	484.	7.46	1.61	1.160E-02	911.07	29.000	9.544E-01	AC228
968.35	363.	8.95	1.82	1.110E-02	964.00	14.580	1.498E+00	EU152
					968.90	17.460	1.247E+00	AC228
1120.33	148.	17.65	1.65	9.970E-03	1120.28	15.040	6.557E-01	BI214

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
1461.20	2172.	2.22	2.09	8.189E-03	1460.75	10.700	1.656E+01	K40
1621.25	22.	26.16	1.16	7.569E-03	1620.56	2.750	7.238E-01	BI212
1764.83	99.	11.05	2.51	7.084E-03	1764.51	15.920	5.849E-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	
179.28	90.17	734.	194.	0.097	63.16	1.189	PB-214	D
185.14	93.10	746.	236.	0.118	52.87	1.191	U-235	D
309.91	155.13	904.	117.	0.058	123.05	0.950	TA-182	s
419.34	209.85	738.	214.	0.107	63.61	1.652	NP-239	s
540.37	270.37	414.	140.	0.070	73.45	1.535	AC-228	s
555.25	277.81	435.	95.	0.047	112.77	1.163	NP-239	l
600.11	300.24	280.	84.	0.042	92.14	1.273	PB-212	sM
656.14	328.26	398.	139.	0.069	78.80	1.069	RH-106M	s
819.24	409.82	203.	101.	0.050	74.65	1.902	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	959.	382.	0.191	37.30	1.178D
PB-212	153.89	77.11	1020.	407.	0.204	30.43	1.179A
PB-214	153.89	77.11	1792.	199.	0.100	83.60	1.500A
EU-155	174.02	87.18	1862.	278.	0.139	68.29	1.500s
CD-109	175.74	88.04	877.	271.	0.136	49.72	1.187D
TH-234	186.19	93.27	1676.	224.	0.112	77.21	1.500s
TH-234	186.13	93.23	1740.	213.	0.107	78.04	1.500s
RA-226	370.93	185.64	1039.	315.	0.157	55.00	1.325s
TH-227	472.35	236.36	1614.	-173.	-0.086	101.28	1.500s
PB-212	476.89	238.63	346.	1628.	0.814	8.76	1.297D
RA-224	483.48	241.92	1198.	134.	0.067	110.92	1.500
PB-214	483.47	241.92	582.	238.	0.119	46.78	1.299D
PB-214	590.39	295.39	590.	435.	0.218	32.80	1.448
AC-228	676.53	338.46	250.	364.	0.182	25.27	1.465s
PB-214	703.86	352.12	351.	647.	0.323	18.92	1.428
SB-125	926.11	463.26	222.	71.	0.036	91.48	1.500s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
TL-208	1021.52	510.96	239.	245.	0.122	32.64	1.587s
TL-208	1166.32	583.37	179.	579.	0.289	17.52	1.729s
BI-214	1218.76	609.59	204.	475.	0.238	21.27	1.502
BI-212	1454.04	727.23	102.	113.	0.056	49.57	1.611s
CS-134	1590.84	795.64	96.	58.	0.029	81.17	1.684s
AC-228	1822.76	911.60	175.	480.	0.240	22.39	1.611
AC-228	1936.26	968.35	156.	361.	0.180	26.86	1.815s
BI-214	2240.22	1120.33	137.	147.	0.073	52.94	1.649s
K-40	2922.01	1461.20	36.	2167.	1.084	6.66	2.089
BI-212	3242.11	1621.25	7.	22.	0.011	78.48	1.162s
BI-214	3529.31	1764.83	6.	99.	0.049	33.16	2.512

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		6.3664E-02					
			477.56	6.366E-02	%(	2.613E-01 7.79E-02	G
K-40		1.6558E+01					
			1460.75	1.656E+01	(P	2.341E-01 3.68E-01	G
MN-54		-6.2112E-05					
			834.81	-6.211E-05	%(P	3.038E-02 8.76E-03	G
CO-57		3.8535E-04					
			122.07	3.854E-04	%(P	3.615E-02 1.08E-02	G K
			136.43	3.085E-02	% P	2.894E-01 8.67E-02	G
CO-60		2.0669E-03					
			1332.51	2.067E-03	%(P	2.850E-02 7.98E-03	G K
			1173.23	7.955E-03	% P	4.261E-02 1.25E-02	G K
Sr-85		-1.7616E-02					
			514.00	-1.762E-02	%(	3.635E-02 1.10E-02	G
Kr-85		-4.1961E+02					
			513.99	-4.196E+02	%(P	8.154E+02 2.46E+02	G
Y-88		-6.6848E-04					
			1836.01	-6.685E-04	&(P	1.819E-02 4.54E-03	G K
			898.02	5.782E-04	% P	2.949E-02 8.43E-03	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
NB-94	-4.1942E-04						
		871.10	-4.194E-04	&(P	2.660E-02	7.62E-03	G K
		702.50	-3.694E-03	& P	2.761E-02	8.08E-03	G K
Ag-108M	6.0769E-03						
		722.95	6.077E-03	%(	3.559E-02	1.05E-02	G K
		614.37	-2.062E-02	%	3.529E-02	1.08E-02	G
		433.93	-4.788E-03	% P	2.802E-02	8.27E-03	G
CD-109	1.4470E+00						
		88.04	1.447E+00	(P	7.508E-01	2.40E-01	G
SN-113	1.2079E-02						
		391.71	1.208E-02	%(P	3.817E-02	1.14E-02	G K
		255.04	-3.400E-02	%	1.232E+00	3.65E-01	G
SB-125	6.0859E-02						
		427.95	-1.529E-03	&(P	6.768E-02	1.96E-02	G K
		600.77	-1.253E-03	& P	1.195E-01	3.42E-02	G
		636.15	2.573E-02	& P	2.103E-01	6.13E-02	G
		463.51	2.455E-01	(P	2.480E-01	7.78E-02	G
		176.29	1.106E-01	& P	4.178E-01	1.26E-01	G
I-131	-9.6004E-03						
		364.48	-9.600E-03	%(	3.556E-02	1.06E-02	G K
		636.97	2.386E-02	&	4.780E-01	1.39E-01	G
		284.29	9.748E-02	%	5.383E-01	1.61E-01	G
CS-134	1.4385E-02						
		604.66	-4.067E-03	&(P	2.655E-02	7.80E-03	G K
		795.76	3.547E-02	*(P	2.967E-02	9.69E-03	G
		569.29	-1.724E-02	&	1.699E-01	4.99E-02	G
		801.84	-1.611E-03	% P	4.095E-01	1.19E-01	G
CS-137	3.8523E-03						
		661.62	3.852E-03	&(P	3.386E-02	9.89E-03	G
CE-139	1.0900E-02						
		165.85	1.090E-02	%(P	3.171E-02	9.57E-03	G
EU-152	-1.4977E-04						
		121.78	-1.498E-04	%(P	1.071E-01	3.20E-02	G K
		344.30	-1.095E-03	% P	9.195E-02	2.71E-02	G
		1408.08	3.811E-02	% P	1.161E-01	3.42E-02	G
		964.00	-1.369E-01	% P	3.311E-01	9.99E-02	G
		1112.07	1.069E-02	% P	2.730E-01	7.91E-02	G
		778.90	-6.722E-03	% P	2.457E-01	7.13E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
EU-154	6.1534E-03						
		123.10	6.153E-03	%(P	7.569E-02	2.27E-02	G K
		1274.80	-3.119E-03	& P	1.120E-01	3.23E-02	G
		723.30	5.439E-03	& P	1.864E-01	5.46E-02	G
		1004.80	4.295E-02	% P	1.701E-01	5.02E-02	G
EU-155	1.7329E-01						
		86.45	1.733E-01	(	1.271E-01	3.94E-02	G K
		105.31	-1.429E-03	& P	1.532E-01	4.58E-02	G
HG-203	1.9585E-02						
		279.17	1.959E-02	%(P	2.908E-02	8.91E-03	G K
		72.87	-5.000E-01	& P	9.974E-01	3.03E-01	G
		70.83	-1.512E-01	%	1.462E+00	4.39E-01	G
		82.50	-7.635E-01	%	1.999E+00	6.05E-01	G
TL-208	2.7660E-01						
		583.14	2.766E-01	*(P	3.113E-02	1.63E-02	G
		510.72	4.025E-01	+ P	1.232E-01	4.98E-02	G
PB-212	7.9513E-01						
		238.63	7.933E-01	(P	4.352E-02	2.34E-02	G K
							Energy duplication
		77.11	5.268E-01	}	1.961E-01	5.34E-02	G
		74.81	9.341E-01	+ P	3.600E-01	1.17E-01	G
PB-214	5.0425E-01						
		351.99	4.813E-01	(P	6.699E-02	3.06E-02	G K
		295.22	5.485E-01	(P	1.460E-01	6.06E-02	G
							Energy duplication
		77.11	4.213E-01	} P	4.232E-01	1.17E-01	G
		241.92	6.759E-01	+ P	3.262E-01	1.06E-01	G
BI-212	4.6627E-01						
		727.17	4.663E-01	(P	2.056E-01	7.79E-02	G K
		1620.56	7.238E-01	+ P	4.695E-01	1.94E-01	G
		785.42	8.226E-01	% P	1.483E+00	4.52E-01	G
BI-214	4.3884E-01						
		609.32	4.388E-01	(P	6.386E-02	3.14E-02	G K
		1764.51	5.849E-01	+ P	8.662E-02	6.52E-02	G
		1120.28	6.557E-01	+ P	2.559E-01	1.16E-01	G
RA-224	7.2423E-01						
		241.00	7.242E-01	?(P	8.881E-01	2.72E-01	G
RA-226	1.7797E+00						
		185.99	1.780E+00	*(	8.649E-01	3.26E-01	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments

AC-228       9.1286E-01
                          911.07 9.544E-01  (P 1.281E-01 7.19E-02 G K
                          968.90 1.247E+00 + P 2.108E-01 1.12E-01 G
                          338.40 8.126E-01 @(P 1.702E-01 6.91E-02 G

TH-227      -3.2211E-01
                          236.00-3.221E-01 ?(P 3.536E-01 1.09E-01 G K
                          256.25-1.746E-02 % P 3.886E-01 1.15E-01 G

PA-234       1.1700E-02
                           98.44 1.170E-02 %(  1.296E-01 3.88E-02 G K
                          946.00-1.747E-02 &   1.525E-01 4.44E-02 G
                          131.28 2.362E-02 &   1.506E-01 4.52E-02 G
                           94.67-1.414E-01 %   2.563E-01 7.79E-02 G
                          883.24 7.278E-02 &   1.942E-01 5.81E-02 G
                          926.70-7.539E-05 &   2.097E-01 5.93E-02 G
                          569.26-2.847E-02 &   2.593E-01 7.62E-02 G

TH-234       1.0308E+00
                           63.29 3.157E-01 %(P 1.576E+00 4.73E-01 G K
                           92.80 1.385E+00  (P 1.280E+00 3.94E-01 G
                           92.38 1.703E+00  (P 1.470E+00 4.54E-01 G

AM-241       1.9331E-02
                           59.54 1.933E-02 &(P 2.099E-01 6.29E-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
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	6.1194E-02	6.3664E-02	2.3358E-01	2.3361E-01	2.512E-01
K-40		1.6558E+01	1.6558E+01	1.1052E+00	1.4757E+00	
MN-54	#A	-6.1692E-05	-6.2112E-05	4.5343E-02	4.5343E-02	3.017E-02
CO-57	#B	3.8235E-04	3.8535E-04	3.2412E-02	3.2412E-02	3.587E-02
CO-60	#B	2.0647E-03	2.0669E-03	2.3949E-02	2.3949E-02	2.847E-02
Sr-85	#A	-1.7051E-02	-1.7616E-02	3.3080E-02	3.3096E-02	3.518E-02
Kr-85	#A	-4.1960E+02	-4.1961E+02	8.3647E+02	8.3683E+02	8.153E+02
Y-88	#B	-6.5536E-04	-6.6848E-04	1.3808E-01	1.3808E-01	1.783E-02
NB-94	#B	-4.1942E-04	-4.1942E-04	3.2962E-02	3.2962E-02	2.660E-02
Ag-108M	#B	6.0766E-03	6.0769E-03	3.1551E-02	3.1553E-02	3.559E-02
CD-109		1.4402E+00	1.4470E+00	7.2032E-01	7.2477E-01	
SN-113	#B	1.1859E-02	1.2079E-02	3.4286E-02	3.4294E-02	3.748E-02
SB-125	#B	6.0732E-02	6.0859E-02	5.7867E-02	5.7979E-02	6.754E-02
I-131	#B	-7.3812E-03	-9.6004E-03	3.1878E-02	3.1883E-02	2.734E-02
CS-134	#B	1.4345E-02	1.4385E-02	1.1783E-02	1.1813E-02	2.648E-02
CS-137	#A	3.8516E-03	3.8523E-03	2.9661E-02	2.9661E-02	3.385E-02
CE-139	#A	1.0734E-02	1.0900E-02	2.8700E-02	2.8707E-02	3.123E-02
EU-152	#B	-1.4970E-04	-1.4977E-04	3.3769E-01	3.3769E-01	1.070E-01
EU-154	#B	6.1492E-03	6.1534E-03	6.8007E-02	6.8008E-02	7.564E-02
EU-155	#	1.7309E-01	1.7329E-01	1.1833E-01	1.1872E-01	1.269E-01
HG-203	#B	1.8717E-02	1.9585E-02	2.6719E-02	2.6744E-02	2.779E-02
TL-208	#	2.7660E-01	2.7660E-01	4.8841E-02	5.1501E-02	
PB-212		7.9513E-01	7.9513E-01	7.0311E-02	8.4552E-02	
PB-214		5.0425E-01	5.0425E-01	9.6134E-02	1.0064E-01	
BI-212		4.6627E-01	4.6627E-01	2.3378E-01	2.3540E-01	
BI-214		4.3884E-01	4.3884E-01	9.4186E-02	9.7687E-02	
RA-224	#A	7.2423E-01	7.2423E-01	8.1674E-01	8.1786E-01	8.881E-01
RA-226	#	1.7797E+00	1.7797E+00	9.7882E-01	9.8445E-01	
AC-228		9.1286E-01	9.1286E-01	1.5547E-01	1.6455E-01	
TH-227	#A	-3.2211E-01	-3.2211E-01	3.2676E-01	3.2732E-01	3.536E-01
PA-234	#B	1.1700E-02	1.1700E-02	1.1650E-01	1.1650E-01	1.296E-01
TH-234	#B	1.0308E+00	1.0308E+00	8.2426E-01	8.2624E-01	1.576E+00
AM-241	#A	1.9330E-02	1.9331E-02	1.8878E-01	1.8879E-01	2.099E-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) 2.3171635E+01 pCi/gm
Total Decayed Activity (270.2 to 2000.1 keV) 2.3178370E+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_29JUN2006_1814.An1

Sample description
FSS-OOL-10-03-017-F

Spectrum Filename: C:\GammaVision\Spectra\107F_29JUN2006_1814.An1

Acquisition information
Start time: 29-Jun-2006 18:14:25
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: 2.1340E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 2.1340E+03) =
4.6860E+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	26-Jun-2006 15:30:00
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. 22 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.1649

***** 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	391.	11.86	1.18	2.849E-02	74.81	9.600	9.057E-01	PB212
76.98	173.	31.80	1.50	2.957E-02	77.11	17.500	PBC<MDA	PB212
					77.11	10.700	PBC<MDA	PB214
77.11	473.	8.75	1.18	2.957E-02	77.11	17.500	8.097E-01	PB212
					77.11	10.700	1.315E+00	PB214
87.23	245.	16.69	1.19	3.317E-02	86.45	32.740	1.447E-01	EU155
89.73	182.	21.74	1.19	3.379E-02	88.04	3.790	PBC<MDA	CD109
93.04	259.	15.64	1.19	3.452E-02	92.38	2.570	1.801E+00	TH234
					92.80	3.000	1.467E+00	TH234
128.13	151.	33.68	1.11	3.816E-02				
128.13	151.	33.68	1.11	3.816E-02	131.28	20.000	1.247E-01	PA234
185.99	163.	24.25	0.98	3.610E-02	185.99	3.280	8.738E-01	RA226
209.64	190.	25.31	1.15	3.426E-02				
238.77	1557.	3.17	1.30	3.188E-02	238.63	43.100	7.102E-01	PB212
241.70	259.	13.83	1.30	3.165E-02	241.00	3.900	1.316E+00	RA224
					241.92	7.470	6.907E-01	PB214
270.51	145.	31.02	1.59	2.942E-02				
278.00	78.	38.35	1.13	2.888E-02				
295.39	340.	8.25	1.34	2.767E-02	295.22	19.200	3.996E-01	PB214
300.24	120.	18.64	1.34	2.734E-02				
328.50	116.	24.17	1.22	2.557E-02				
338.38	362.	13.22	1.40	2.500E-02	338.40	12.010	7.564E-01	AC228
352.09	577.	6.41	1.46	2.425E-02	351.99	37.100	4.021E-01	PB214
409.71	75.	35.74	1.41	2.154E-02				
463.05	121.	18.82	1.63	1.954E-02				
463.05	121.	18.82	1.63	1.954E-02	463.51	10.000	3.841E-01	SB125
511.45	246.	12.58	1.15	1.806E-02	510.72	22.500	3.302E-01	TL208

583.40	524.	5.63	1.49	1.628E-02	583.14	86.000	2.346E-01	TL208
609.52	489.	7.14	1.75	1.574E-02	609.32	46.090	4.232E-01	BI214
727.64	206.	17.70	1.53	1.374E-02	727.17	11.800	8.002E-01	BI212
795.42	78.	21.74	1.45	1.284E-02				
795.42	78.	21.74	1.45	1.284E-02	795.76	85.400	4.458E-02	CS134
860.84	92.	19.29	1.74	1.211E-02				
911.63	380.	7.74	1.91	1.160E-02	911.07	29.000	7.074E-01	AC228
964.57	67.	21.48	1.80	1.113E-02				
969.34	256.	7.58	1.80	1.109E-02	968.90	17.460	8.294E-01	AC228
1120.82	127.	21.18	1.68	9.966E-03	1120.28	15.040	5.339E-01	BI214

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
1461.26	2057.	2.29	2.13	8.189E-03	1460.75	10.700	1.483E+01	K40
1620.76	20.	38.27	0.75	7.569E-03	1620.56	2.750	6.175E-01	BI212
1765.08	91.	11.71	2.23	7.082E-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	
174.15	87.67	783.	188.	0.094	67.00	1.187	PB-214	D
179.16	90.17	735.	155.	0.077	78.22	1.189	PB-214	D
185.77	93.47	699.	248.	0.124	49.15	1.191	U-235	D
255.91	128.13	992.	168.	0.084	82.62	1.109	AC-228	s
418.92	209.64	790.	190.	0.095	75.93	1.148	NP-239	s
540.65	270.51	607.	145.	0.073	93.07	1.590	AC-228	s
555.62	278.00	353.	77.	0.039	108.34	1.126	NP-239	
600.03	300.20	280.	110.	0.055	74.52	1.141	PB-212	M
656.61	328.50	266.	116.	0.058	72.51	1.222	RH-106M	s
819.02	409.71	236.	75.	0.037	107.22	1.405	AC-228	
1721.24	860.84	79.	92.	0.046	57.87	1.745	TL-208	
1929.60	964.61	63.	74.	0.037	57.77	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	905.	391.	0.196	35.59	1.178D
PB-212	153.89	77.11	941.	473.	0.237	26.25	1.179A
PB-214	153.89	77.11	1630.	173.	0.087	95.41	1.500A
EU-155	173.91	87.12	1821.	176.	0.088	105.16	1.500
TH-234	185.83	93.09	1718.	226.	0.113	77.52	1.500s
TH-234	185.81	93.07	1657.	221.	0.110	73.96	1.500s
RA-226	371.63	185.99	640.	163.	0.082	72.76	0.981s
PB-212	476.89	238.63	388.	1539.	0.769	9.26	1.297D
RA-224	481.33	240.85	534.	121.	0.060	84.09	1.500
PB-214	483.47	241.92	579.	231.	0.116	48.07	1.299D
PB-214	590.33	295.35	415.	369.	0.185	31.33	1.770s
AC-228	676.37	338.38	524.	359.	0.179	39.67	1.402
PB-214	703.79	352.09	298.	571.	0.286	19.23	1.465

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
SB-125	925.85	463.12	178.	100.	0.050	62.16	1.500s
TL-208	1022.49	511.45	256.	212.	0.106	37.75	1.147s
TL-208	1166.38	583.40	132.	519.	0.259	16.88	1.495
BI-214	1218.61	609.52	207.	485.	0.242	21.41	1.747
Ag-108M	1223.25	611.83	326.	-110.	-0.055	75.33	1.561s
BI-212	1454.86	727.64	246.	205.	0.102	53.10	1.526
CS-134	1590.22	795.32	100.	76.	0.038	65.37	1.684
AC-228	1822.83	911.63	129.	376.	0.188	23.22	1.906s
AC-228	1937.36	968.90	75.	254.	0.127	23.50	1.799D
BI-214	2241.20	1120.82	155.	126.	0.063	63.53	1.677
K-40	2922.11	1461.26	39.	2052.	1.026	6.87	2.130
BI-212	3241.14	1620.76	12.	20.	0.010	114.81	0.750s
BI-214	3529.81	1765.08	8.	90.	0.045	35.14	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		4.4275E-02					
			477.56	4.428E-02	%(	2.239E-01 6.63E-02 G	
K-40		1.4827E+01					
			1460.75	1.483E+01	(P	2.297E-01 3.41E-01 G	
MN-54		8.1607E-03					
			834.81	8.161E-03	%(P	2.848E-02 8.47E-03 G	
CO-57		4.3684E-03					
			122.07	4.368E-03	%(P	3.427E-02 1.03E-02 G K	
			136.43	-7.140E-03	% P	2.681E-01 8.01E-02 G	
CO-60		-1.1317E-03					
			1332.51	-1.132E-03	%(P	2.992E-02 8.32E-03 G K	
			1173.23	6.289E-03	% P	3.665E-02 1.07E-02 G K	
Sr-85		-1.2291E-02					
			514.00	-1.229E-02	&(	3.267E-02 9.84E-03 G	
Kr-85		-2.9950E+02					
			513.99	-2.995E+02	&(P	7.326E+02 2.20E+02 G	

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
Y-88	-1.0112E-04						
		1836.01	-1.011E-04	%(P	1.930E-02	5.00E-03	G K
		898.02	-4.107E-03	% P	2.808E-02	8.09E-03	G
NB-94	9.5366E-03						
		871.10	9.537E-03	%(P	2.327E-02	6.99E-03	G K
		702.50	4.938E-05	& P	2.593E-02	7.50E-03	G K
Ag-108M	2.3199E-03						
		722.95	2.320E-03	%(	2.201E-02	6.36E-03	G K
		614.37	-4.923E-02	+	3.889E-02	1.24E-02	G
		433.93	1.226E-02	% P	2.273E-02	6.91E-03	G
CD-109	2.9722E-01						
		88.04	2.972E-01	%(P	9.983E-01	3.01E-01	G
SN-113	9.5685E-03						
		391.71	9.569E-03	&(P	3.214E-02	9.59E-03	G K
		255.04	4.660E-01	&	1.041E+00	3.15E-01	G
SB-125	1.0023E-01						
		427.95	2.444E-02	&(P	6.855E-02	2.05E-02	G K
		600.77	-3.144E-03	% P	9.790E-02	2.77E-02	G
		636.15	2.017E-02	% P	2.073E-01	6.04E-02	G
		463.51	3.246E-01	@(P	2.108E-01	6.92E-02	G
		176.29	-4.728E-02	% P	4.106E-01	1.23E-01	G
I-131	7.2297E-04						
		364.48	7.230E-04	%(	3.242E-02	9.50E-03	G K
		636.97	4.583E-02	%	3.959E-01	1.15E-01	G
		284.29	1.024E-02	&	5.237E-01	1.55E-01	G
CS-134	-2.0502E-02						
		604.66	-2.050E-02	%(P	3.252E-02	9.95E-03	G K
		795.76	4.381E-02	+ P	2.859E-02	9.61E-03	G
		569.29	-2.690E-03	%	1.460E-01	4.23E-02	G
		801.84	4.592E-02	& P	2.905E-01	8.50E-02	G
CS-137	5.3261E-03						
		661.62	5.326E-03	%(P	2.816E-02	8.24E-03	G
CE-139	-8.2199E-03						
		165.85	-8.220E-03	&(P	3.238E-02	9.74E-03	G
EU-152	3.5651E-03						
		121.78	3.565E-03	%(P	7.813E-02	2.33E-02	G K
		344.30	-1.341E-02	% P	7.203E-02	2.13E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
		1408.08	4.394E-02	% P	1.011E-01	3.03E-02	G
		964.00	-8.780E-05	% P	2.426E-01	7.04E-02	G
		1112.07	1.036E-02	% P	2.487E-01	7.19E-02	G
		778.90	-2.542E-02	% P	1.896E-01	5.51E-02	G
EU-154	-2.2749E-03						
		123.10	-2.275E-03	&(P	6.648E-02	1.99E-02	G K
		1274.80	2.082E-02	& P	8.587E-02	2.52E-02	G
		723.30	2.291E-02	& P	1.287E-01	3.78E-02	G
		1004.80	-3.746E-02	& P	1.849E-01	5.45E-02	G
EU-155	1.0394E-01						
		86.45	1.039E-01	(	1.189E-01	3.64E-02	G K
		105.31	4.604E-02	% P	1.404E-01	4.24E-02	G
HG-203	-2.9598E-04						
		279.17	-2.960E-04	%(P	2.989E-02	8.83E-03	G K
		72.87	-6.431E-01	% P	8.992E-01	2.74E-01	G
		70.83	-9.543E-01	&	1.510E+00	4.60E-01	G
		82.50	-8.929E-01	%	1.624E+00	4.94E-01	G
TL-208	2.3458E-01						
		583.14	2.346E-01	(P	2.543E-02	1.33E-02	G
		510.72	3.302E-01	+ P	1.202E-01	4.82E-02	G
PB-212	7.0879E-01						
		238.63	7.088E-01	(P	4.355E-02	2.21E-02	G K
							Energy duplication
		77.11	5.788E-01	}	1.783E-01	5.06E-02	G
		74.81	9.057E-01	+ P	3.308E-01	1.09E-01	G
PB-214	4.1497E-01						
		351.99	4.021E-01	(P	5.846E-02	2.60E-02	G K
		295.22	4.398E-01	(P	1.164E-01	4.65E-02	G
							Energy duplication
		77.11	3.465E-01	} P	3.819E-01	1.10E-01	G
		241.92	6.191E-01	+ P	3.078E-01	9.98E-02	G
BI-212	7.6566E-01						
		727.17	8.002E-01	(P	2.960E-01	1.43E-01	G K
		1620.56	6.175E-01	(P	5.674E-01	2.42E-01	G
		785.42	6.040E-01	% P	1.300E+00	3.93E-01	G
BI-214	4.6201E-01						
		609.32	4.232E-01	(P	6.090E-02	3.05E-02	G K
		1764.51	5.065E-01	(P	8.828E-02	5.99E-02	G
		1120.28	5.339E-01	(P	2.561E-01	1.14E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
RA-224	6.1779E-01						
		241.00	6.178E-01	(P	5.653E-01	1.76E-01	G
RA-226	8.7383E-01						
		185.99	8.738E-01	@(	6.447E-01	2.12E-01	G
AC-228	7.5397E-01						
		911.07	7.074E-01	@(P	1.046E-01	5.54E-02	G K
		968.90	8.296E-01	(P	1.411E-01	6.56E-02	G
		338.40	7.564E-01	(P	2.307E-01	1.01E-01	G
TH-227	-1.3281E-01						
		236.00	-1.328E-01	&(P	2.605E-01	7.91E-02	G K
		256.25	2.992E-03	& P	3.609E-01	1.07E-01	G
PA-234	1.3310E-02						
		98.44	1.331E-02	%(	1.029E-01	3.08E-02	G K
		946.00	-2.935E-02	&	1.524E-01	4.49E-02	G
		131.28	-1.910E-02	%	1.128E-01	3.38E-02	G
		94.67	-8.590E-02	%	2.351E-01	7.11E-02	G
		883.24	-1.407E-02	%	2.117E-01	6.11E-02	G
		926.70	7.414E-02	%	1.981E-01	5.92E-02	G
		569.26	-5.378E-03	%	2.162E-01	6.27E-02	G
TH-234	1.0869E+00						
		63.29	5.267E-01	%(P	1.486E+00	4.48E-01	G K
		92.80	1.355E+00	(P	1.181E+00	3.64E-01	G
		92.38	1.624E+00	(P	1.407E+00	4.34E-01	G
AM-241	6.7668E-04						
		59.54	6.767E-04	%(P	1.885E-01	5.63E-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	4.2521E-02	4.4275E-02	1.9895E-01	1.9897E-01	2.150E-01
K-40		1.4827E+01	1.4827E+01	1.0215E+00	1.3455E+00	
MN-54	#A	8.1045E-03	8.1607E-03	2.5396E-02	2.5401E-02	2.829E-02
CO-57	#B	4.3336E-03	4.3684E-03	3.0836E-02	3.0837E-02	3.399E-02
CO-60	#B	-1.1305E-03	-1.1317E-03	6.0544E-02	6.0544E-02	2.988E-02
Sr-85	#A	-1.1889E-02	-1.2291E-02	2.9530E-02	2.9539E-02	3.160E-02
Kr-85	#A	-2.9949E+02	-2.9950E+02	7.7700E+02	7.7720E+02	7.326E+02
Y-88	#B	-9.9089E-05	-1.0112E-04	1.9519E-02	1.9519E-02	1.892E-02
NB-94	#B	9.5366E-03	9.5366E-03	2.0980E-02	2.0988E-02	2.327E-02
Ag-108M	#B	2.3198E-03	2.3199E-03	1.9069E-02	1.9070E-02	2.201E-02
CD-109	#A	2.9581E-01	2.9722E-01	9.0393E-01	9.0408E-01	9.936E-01
SN-113	#B	9.3908E-03	9.5685E-03	2.8777E-02	2.8783E-02	3.155E-02
SB-125	#F	1.0002E-01	1.0023E-01	6.4060E-02	6.4333E-02	6.840E-02
I-131	#B	5.5274E-04	7.2297E-04	2.8501E-02	2.8501E-02	2.479E-02
CS-134	#B	-2.0444E-02	-2.0502E-02	3.0480E-02	3.0504E-02	3.242E-02
CS-137	#A	5.3250E-03	5.3261E-03	2.4720E-02	2.4722E-02	2.816E-02
CE-139	#A	-8.0919E-03	-8.2199E-03	2.9738E-02	2.9742E-02	3.187E-02
EU-152	#B	3.5635E-03	3.5651E-03	6.9847E-02	6.9847E-02	7.809E-02
EU-154	#B	-2.2733E-03	-2.2749E-03	7.2499E-02	7.2499E-02	6.643E-02
EU-155	#A	1.0382E-01	1.0394E-01	1.0931E-01	1.0946E-01	1.187E-01
HG-203	#B	-2.8258E-04	-2.9598E-04	2.5030E-01	2.5030E-01	2.854E-02
TL-208		2.3458E-01	2.3458E-01	3.9946E-02	4.2280E-02	
PB-212		7.0879E-01	7.0879E-01	6.6271E-02	7.8385E-02	
PB-214		4.1497E-01	4.1497E-01	7.7150E-02	8.0949E-02	
BI-212		7.6566E-01	7.6566E-01	4.0915E-01	4.1164E-01	
BI-214		4.6201E-01	4.6201E-01	9.9816E-02	1.0348E-01	
RA-224		6.1779E-01	6.1779E-01	5.2912E-01	5.3038E-01	5.653E-01
RA-226	#	8.7383E-01	8.7383E-01	6.3580E-01	6.3789E-01	
AC-228		7.5397E-01	7.5397E-01	1.3097E-01	1.3833E-01	
TH-227	#B	-1.3281E-01	-1.3281E-01	2.3898E-01	2.3911E-01	2.605E-01

PA-234 #B	1.3310E-02	1.3310E-02	9.2413E-02	9.2416E-02	1.029E-01

TH-234 #B	1.0869E+00	1.0869E+00	8.7225E-01	8.7433E-01	1.486E+00
AM-241 #A	6.7667E-04	6.7668E-04	1.6889E-01	1.6889E-01	1.885E-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 (1015.7 to 2000.1 keV) 1.9658415E+01 pCi/gm
Total Decayed Activity (1015.7 to 2000.1 keV) 1.9658419E+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_29JUNE2006_1428.An1

Sample description
FSS-OOL-10-03-015-F

Spectrum Filename: C:\GammaVision\Spectra\107F_29JUNE2006_1428.An1

Acquisition information
Start time: 29-Jun-2006 14:29:54
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: 1.9550E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.9550E+03) =
5.1151E+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	26-Jun-2006 14:47:00
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. 25 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.1825

***** 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	420.	16.17	1.50	2.849E-02				
74.85	420.	16.17	1.50	2.849E-02	74.81	9.600	1.060E+00	PB212
77.11	667.	9.97	1.50	2.957E-02	77.11	17.500	8.914E-01	PB212
					77.11	10.700	1.447E+00	PB214
77.11	663.	9.97	1.50	2.957E-02	77.11	17.500	8.850E-01	PB212
					77.11	10.700	1.447E+00	PB214
86.82	242.	17.70	1.19	3.287E-02	86.45	32.740	1.560E-01	EU155
90.05	191.	21.35	1.19	3.371E-02	88.04	3.790	PBC<MDA	CD109
93.38	218.	18.32	1.19	3.446E-02	92.38	2.570	1.650E+00	TH234
					92.80	3.000	1.331E+00	TH234
129.28	107.	37.72	1.29	3.819E-02				
186.13	209.	21.40	1.01	3.609E-02	185.99	3.280	1.218E+00	RA226
208.45	189.	23.19	1.19	3.435E-02				
238.73	1816.	2.74	1.30	3.189E-02	238.63	43.100	9.050E-01	PB212
241.74	288.	12.11	1.30	3.164E-02	241.00	3.900	1.595E+00	RA224
					241.92	7.470	8.372E-01	PB214
270.45	103.	26.58	1.05	2.943E-02				
277.50	139.	27.15	1.02	2.891E-02				
277.50	139.	27.15	1.02	2.891E-02	279.17	81.500	4.241E-02	HG203
295.37	362.	7.52	1.34	2.767E-02	295.22	19.200	4.655E-01	PB214
300.33	145.	15.88	1.34	2.734E-02				
327.76	140.	23.23	1.44	2.562E-02				
338.55	413.	9.56	1.16	2.499E-02	338.40	12.010	9.442E-01	AC228
352.09	695.	6.62	1.26	2.425E-02	351.99	37.100	5.297E-01	PB214
463.49	118.	24.59	1.52	1.953E-02				
463.49	118.	24.59	1.52	1.953E-02	463.51	10.000	4.082E-01	SB125
511.06	274.	12.98	1.49	1.807E-02	510.72	22.500	4.079E-01	TL208

583.30	594.	4.98	1.52	1.629E-02	583.14	86.000	2.911E-01	TL208
609.50	499.	7.51	1.36	1.574E-02	609.32	46.090	4.713E-01	BI214
661.88	41.	30.17	1.59	1.477E-02	661.62	84.620	PBC<MDA	CS137
663.22	94.	26.52	0.89	1.474E-02				
727.52	136.	15.53	1.17	1.374E-02	727.17	11.800	5.759E-01	BI212
795.16	89.	24.75	2.02	1.285E-02				
795.16	89.	24.75	2.02	1.285E-02	795.76	85.400	5.580E-02	CS134
861.20	106.	18.17	1.04	1.210E-02				
911.43	420.	6.42	1.63	1.160E-02	911.07	29.000	8.537E-01	AC228
934.34	39.	29.71	1.30	1.139E-02				
964.53	72.	19.00	1.80	1.113E-02				
969.13	227.	8.13	1.80	1.109E-02	968.90	17.460	8.012E-01	AC228

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
1121.22	121.	20.98	1.99	9.964E-03	1120.28	15.040	5.528E-01	BI214
1332.45	28.	35.97	2.03	8.773E-03	1332.51	99.980	PBC<MDA	CO60
1461.05	1964.	2.34	2.10	8.190E-03	1460.75	10.700	1.545E+01	K40
1765.32	79.	12.64	2.96	7.084E-03	1764.51	15.920	4.812E-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	
173.30	86.58	800.	242.	0.121	53.11	1.187	BI-207	D
179.76	89.81	739.	191.	0.096	64.05	1.189	PB-214	D
186.42	93.14	691.	218.	0.109	54.96	1.191	U-235	D
258.21	129.28	761.	107.	0.054	113.04	1.292	AC-228	
416.54	208.45	693.	189.	0.094	69.58	1.185	LU-177	s
477.09	238.74	326.	1812.	0.906	8.22	1.297	PB-212	D
540.53	270.45	308.	103.	0.052	79.75	1.047	AC-228	M
600.14	300.26	379.	132.	0.066	77.31	1.140	PB-212	
655.14	327.76	340.	140.	0.070	69.70	1.435	AC-228	s
1326.01	663.22	152.	94.	0.047	79.57	0.894	CE-143	l
1672.20	836.32	50.	31.	0.015	110.21	1.511	J-135	l
1721.97	861.20	84.	106.	0.053	54.52	1.036	TL-208	s
1868.24	934.34	45.	39.	0.019	89.14	1.297	BI-214	
1929.03	964.52	57.	73.	0.036	56.23	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	149.37	74.85	2137.	420.	0.210	48.52	1.500s
PB-212	153.89	77.11	1880.	667.	0.334	29.91	1.500D
PB-214	153.89	77.11	1885.	663.	0.331	29.91	1.500D
EU-155	174.12	87.23	1827.	202.	0.101	92.02	1.500
TH-234	185.96	93.15	1651.	204.	0.102	83.84	1.500s
TH-234	185.90	93.12	1593.	195.	0.098	80.92	1.500s
RA-226	371.91	186.13	743.	209.	0.104	64.20	1.010
PB-212	477.09	238.73	895.	1491.	0.745	11.38	1.500
RA-224	481.63	241.00	1684.	215.	0.107	82.79	1.299D
PB-214	483.29	241.83	1124.	163.	0.081	89.58	1.500

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
HG-203	555.01	277.69	396.	90.	0.045	97.49	1.500
PB-214	590.29	295.33	387.	339.	0.170	29.06	1.500
AC-228	676.72	338.55	362.	410.	0.205	28.67	1.165
PB-214	703.77	352.08	272.	652.	0.326	15.76	1.500
SB-125	926.15	463.28	207.	93.	0.046	70.54	1.500s
TL-208	1021.71	511.06	301.	240.	0.120	38.95	1.487s
TL-208	1166.19	583.30	117.	590.	0.295	14.93	1.524
BI-214	1218.57	609.50	236.	495.	0.247	22.53	1.363
CS-137	1322.82	661.62	70.	41.	0.020	90.51	1.594D
BI-212	1454.62	727.52	113.	135.	0.068	46.60	1.165
CS-134	1590.09	795.26	118.	69.	0.035	74.94	1.684s
AC-228	1822.43	911.43	106.	416.	0.208	19.25	1.626
AC-228	1937.36	968.90	60.	224.	0.112	24.44	1.799D
BI-214	2242.01	1121.22	138.	120.	0.060	62.93	1.989
CO-60	2664.49	1332.45	52.	28.	0.014	107.92	2.031s
K-40	2921.70	1461.05	33.	1959.	0.980	7.01	2.101
BI-214	3530.29	1765.32	6.	79.	0.039	37.91	2.956s

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		-2.1959E-02					
			477.56	-2.196E-02	%(	2.490E-01 7.31E-02 G	
K-40		1.5452E+01					
			1460.75	1.545E+01	(P	2.316E-01 3.62E-01 G	
MN-54		-4.0533E-03					
			834.81	-4.053E-03	%(P	3.008E-02 8.77E-03 G	
CO-57		4.3156E-03					
			122.07	4.316E-03	%(P	3.557E-02 1.07E-02 G K	
			136.43	-6.177E-02	& P	2.820E-01 8.48E-02 G	
CO-60		2.1785E-02					
			1332.51	2.179E-02	@(P	2.859E-02 8.90E-03 G K	
			1173.23	2.532E-02	% P	4.082E-02 1.25E-02 G K	
Sr-85		-1.6239E-02					
			514.00	-1.624E-02	&(	3.720E-02 1.13E-02 G	

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
Kr-85	-3.9002E+02						
		513.99	-3.900E+02	&(P	8.350E+02	2.52E+02	G
Y-88	2.6959E-04						
		1836.01	2.696E-04	%(P	1.930E-02	4.95E-03	G K
		898.02	2.987E-03	% P	3.105E-02	8.97E-03	G
NB-94	1.0916E-02						
		871.10	1.092E-02	%(P	2.178E-02	6.62E-03	G K
		702.50	7.321E-03	& P	3.082E-02	9.14E-03	G K
Ag-108M	6.9901E-03						
		722.95	6.990E-03	&(	2.881E-02	8.52E-03	G K
		614.37	-9.364E-03	%	3.644E-02	1.09E-02	G
		433.93	-6.681E-04	% P	2.720E-02	7.92E-03	G
CD-109	-7.1046E-03						
		88.04	-7.105E-03	&(P	1.115E+00	3.34E-01	G
SN-113	-4.4877E-03						
		391.71	-4.488E-03	&(P	3.869E-02	1.14E-02	G K
		255.04	0.000E+00	%	1.252E+00	3.71E-01	G
SB-125	1.0213E-01						
		427.95	2.556E-02	%(P	7.342E-02	2.20E-02	G K
		600.77	-1.329E-02	% P	1.350E-01	3.91E-02	G
		636.15	3.754E-02	% P	2.311E-01	6.78E-02	G
		463.51	3.288E-01	@(P	2.475E-01	7.96E-02	G
		176.29	-9.540E-02	% P	4.407E-01	1.32E-01	G
I-131	9.9261E-04						
		364.48	9.926E-04	%(	4.070E-02	1.20E-02	G K
		636.97	8.543E-02	%	4.279E-01	1.26E-01	G
		284.29	5.616E-02	%	4.906E-01	1.46E-01	G
CS-134	1.5617E-02						
		604.66	-9.155E-03	&(P	3.371E-02	1.01E-02	G K
		795.76	4.393E-02	(P	3.378E-02	1.11E-02	G
		569.29	-2.994E-02	&	1.685E-01	4.97E-02	G
		801.84	-4.547E-02	% P	3.461E-01	1.01E-01	G
CS-137	2.2493E-02						
		661.62	2.249E-02	(P	2.312E-02	7.38E-03	G
CE-139	7.1750E-03						
		165.85	7.175E-03	&(P	3.557E-02	1.07E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
EU-152	-1.0439E-02						
		121.78	-1.044E-02	%(P	1.080E-01	3.24E-02	G K
		344.30	2.954E-03	% P	6.943E-02	2.03E-02	G
		1408.08	1.463E-03	% P	1.135E-01	3.12E-02	G
		964.00	6.043E-03	& P	1.628E-01	4.62E-02	G
		1112.07	-2.057E-03	% P	2.501E-01	7.16E-02	G
		778.90	-6.273E-02	% P	2.054E-01	6.09E-02	G
EU-154	-6.4881E-03						
		123.10	-6.488E-03	&(P	7.551E-02	2.26E-02	G K
		1274.80	-7.199E-04	& P	1.332E-01	3.86E-02	G
		723.30	-9.986E-03	& P	2.765E-01	8.19E-02	G
		1004.80	-4.963E-02	% P	1.864E-01	5.52E-02	G
EU-155	1.3031E-01						
		86.45	1.303E-01	(	1.299E-01	4.00E-02	G K
		105.31	3.154E-02	% P	1.509E-01	4.54E-02	G
HG-203	2.7728E-02						
		279.17	2.773E-02	(P	2.940E-02	9.14E-03	G K
		72.87	-7.169E-01	% P	1.022E+00	3.11E-01	G
		70.83	5.828E-02	%	2.056E+00	6.18E-01	G
		82.50	-8.624E-01	%	1.982E+00	6.00E-01	G
TL-208	2.9109E-01						
		583.14	2.911E-01	(P	2.621E-02	1.46E-02	G
		510.72	4.079E-01	+ P	1.420E-01	6.04E-02	G
PB-212	7.4955E-01						
		238.63	7.495E-01	(P	7.147E-02	2.87E-02	G K
							Energy duplication
		77.11	8.914E-01	+	2.735E-01	8.89E-02	G
		74.81	1.060E+00	& P	5.512E-01	1.73E-01	G
PB-214	4.7983E-01						
		351.99	5.004E-01	(P	6.110E-02	2.65E-02	G K
		295.22	4.412E-01	(P	1.228E-01	4.33E-02	G
							Energy duplication
		77.11	1.447E+00	+ P	4.479E-01	1.45E-01	G
		241.92	4.767E-01	?(P	4.650E-01	1.44E-01	G
BI-212	5.7592E-01						
		727.17	5.759E-01	(P	2.226E-01	9.03E-02	G K
		1620.56	1.987E-01	% P	7.728E-01	2.21E-01	G
		785.42	7.832E-01	% P	1.431E+00	4.36E-01	G
BI-214	4.8923E-01						
		609.32	4.713E-01	(P	7.083E-02	3.57E-02	G K
		1764.51	4.812E-01	@(P	8.941E-02	6.15E-02	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                         1120.28 5.528E-01  (P 2.649E-01 1.17E-01 G

RA-224       1.1997E+00
                          241.00 1.200E+00  (P 1.084E+00 3.35E-01 G

RA-226       1.2177E+00
                          185.99 1.218E+00  (  7.575E-01 2.61E-01 G

AC-228       8.5662E-01
                          911.07 8.537E-01  (P 1.042E-01 5.53E-02 G K
                          968.90 8.012E-01  (P 1.380E-01 6.59E-02 G
                          338.40 9.442E-01  (P 2.103E-01 9.10E-02 G

TH-227      -1.6378E-01
                          236.00-1.638E-01 %(P 3.043E-01 9.25E-02 G K
                          256.25-8.552E-02 % P 3.966E-01 1.19E-01 G

PA-234       4.9371E-04
                           98.44 4.937E-04 %(  1.312E-01 3.92E-02 G K
                          946.00 1.315E-02 %   1.200E-01 3.45E-02 G
                          131.28-2.468E-03 &   1.469E-01 4.39E-02 G
                           94.67 4.751E-04 %   1.919E-01 5.72E-02 G
                          883.24 1.489E-02 %   2.454E-01 7.10E-02 G
                          926.70 0.000E+00 %   2.455E-01 7.00E-02 G
                          569.26-4.430E-02 &   2.492E-01 7.36E-02 G

TH-234       1.1740E+00
                           63.29 7.918E-01 %(P 1.641E+00 4.97E-01 G K
                           92.80 1.308E+00  (P 1.264E+00 3.89E-01 G
                           92.38 1.597E+00  (P 1.506E+00 4.64E-01 G

AM-241       1.2966E-02
                           59.54 1.297E-02 &(P 1.626E-01 4.85E-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	-2.1124E-02	-2.1959E-02	2.1933E-01	2.1933E-01	2.395E-01
K-40		1.5452E+01	1.5452E+01	1.0853E+00	1.4180E+00	
MN-54	#A	-4.0265E-03	-4.0533E-03	2.9648E-02	2.9649E-02	2.988E-02
CO-57	#B	4.2826E-03	4.3156E-03	3.1983E-02	3.1983E-02	3.530E-02
CO-60	#B	2.1762E-02	2.1785E-02	2.6713E-02	2.6744E-02	2.856E-02
Sr-85	#A	-1.5729E-02	-1.6239E-02	3.3758E-02	3.3771E-02	3.603E-02
Kr-85	#A	-3.9001E+02	-3.9002E+02	8.6596E+02	8.6626E+02	8.350E+02
Y-88	#B	2.6441E-04	2.6959E-04	1.4840E-02	1.4840E-02	1.892E-02
NB-94	#B	1.0916E-02	1.0916E-02	1.9874E-02	1.9885E-02	2.178E-02
Ag-108M	#B	6.9898E-03	6.9901E-03	2.5553E-02	2.5557E-02	2.881E-02
CD-109	#A	-7.0722E-03	-7.1046E-03	1.6627E+00	1.6627E+00	1.110E+00
SN-113	#B	-4.4077E-03	-4.4877E-03	5.1044E-02	5.1045E-02	3.800E-02
SB-125	#F	1.0192E-01	1.0213E-01	7.4224E-02	7.4469E-02	7.327E-02
I-131	#B	7.6718E-04	9.9261E-04	3.5961E-02	3.5961E-02	3.146E-02
CS-134	#B	1.5575E-02	1.5617E-02	1.1793E-02	1.1829E-02	3.362E-02
CS-137	A	2.2489E-02	2.2493E-02	2.2126E-02	2.2166E-02	
CE-139	#A	7.0678E-03	7.1750E-03	3.2043E-02	3.2046E-02	3.504E-02
EU-152	#B	-1.0435E-02	-1.0439E-02	9.8730E-02	9.8732E-02	1.080E-01
EU-154	#B	-6.4837E-03	-6.4881E-03	7.3095E-02	7.3096E-02	7.546E-02
EU-155	#	1.3016E-01	1.3031E-01	1.1991E-01	1.2013E-01	1.298E-01
HG-203	A	2.6522E-02	2.7728E-02	2.7422E-02	2.7471E-02	2.812E-02
TL-208		2.9109E-01	2.9109E-01	4.3804E-02	4.7057E-02	
PB-212	#	7.4955E-01	7.4955E-01	8.6202E-02	9.6905E-02	7.147E-02
PB-214	#	4.7983E-01	4.7983E-01	7.6218E-02	8.1316E-02	6.110E-02
BI-212		5.7592E-01	5.7592E-01	2.7093E-01	2.7305E-01	
BI-214		4.8923E-01	4.8923E-01	1.1117E-01	1.1486E-01	
RA-224		1.1997E+00	1.1997E+00	1.0036E+00	1.0061E+00	
RA-226		1.2177E+00	1.2177E+00	7.8176E-01	7.8506E-01	
AC-228		8.5662E-01	8.5662E-01	1.2190E-01	1.3198E-01	

TH-227 #B	-1.6378E-01	-1.6378E-01	2.7916E-01	2.7933E-01	3.043E-01

PA-234 #B	4.9371E-04	4.9371E-04	1.1752E-01	1.1752E-01	1.312E-01
TH-234 #B	1.1740E+00	1.1740E+00	8.8303E-01	8.8542E-01	1.641E+00
AM-241 #A	1.2965E-02	1.2966E-02	1.4554E-01	1.4554E-01	1.626E-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) 2.0131741E+01 pCi/gm
Total Decayed Activity (1120.2 to 2000.1 keV) 2.0132956E+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_1AUG.An1

Sample description
FSS-OOL-10-04-004-F

Spectrum Filename: C:\GammaVision\Spectra\101F_1AUG.An1

Acquisition information
Start time: 01-Aug-2006 11:36:24
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: 1.9900E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.9900E+03) =
5.0251E+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	27-Jul-2006 08:40:00
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. 16 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.3848

***** 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	170.	19.79	1.00	1.651E-02				
74.49	170.	19.79	1.00	1.651E-02	74.81	9.600	7.058E-01	PB212
77.28	400.	8.54	1.01	1.731E-02	77.11	17.500	9.029E-01	PB212
					77.11	10.700	1.463E+00	PB214
84.64	74.	40.57	1.04	1.881E-02				
87.79	121.	24.73	1.01	1.937E-02	88.04	3.790	PBC<MDA	CD109
89.62	73.	40.39	1.02	1.960E-02				
89.62	73.	40.39	1.02	1.960E-02	92.38	2.570	PBC<MDA	TH234
93.23	170.	17.21	1.02	2.000E-02	92.80	3.000	1.866E+00	TH234
186.04	111.	27.86	0.97	1.858E-02	185.99	3.280	1.233E+00	RA226
209.53	94.	27.25	1.34	1.720E-02				
238.99	692.	4.55	1.12	1.555E-02	238.63	43.100	6.935E-01	PB212
					241.92	7.470	4.079E+00	PB214
242.06	101.	22.51	1.12	1.539E-02				
270.35	92.	26.89	1.07	1.400E-02				
295.60	176.	13.81	1.07	1.290E-02	295.22	19.200	4.764E-01	PB214
300.96	65.	32.83	0.70	1.269E-02				
338.61	147.	18.29	1.05	1.134E-02	338.40	12.010	7.214E-01	AC228
352.22	358.	7.64	1.15	1.092E-02	351.99	37.100	5.965E-01	PB214
511.72	113.	17.99	1.72	7.576E-03	510.72	22.500	3.872E-01	TL208
583.78	233.	9.12	1.32	6.677E-03	583.14	86.000	2.722E-01	TL208
609.75	242.	9.50	1.42	6.408E-03	609.32	46.090	5.546E-01	BI214
728.08	56.	20.88	1.26	5.437E-03	727.17	11.800	5.796E-01	BI212
796.07	36.	33.33	1.08	5.014E-03	795.76	85.400	5.667E-02	CS134
912.14	141.	11.68	1.38	4.442E-03	911.07	29.000	7.327E-01	AC228
965.48	38.	25.37	1.61	4.225E-03	964.00	14.580	PBC<MDA	EU152
969.81	76.	14.28	1.62	4.208E-03	968.90	17.460	6.909E-01	AC228

1120.40	50.	30.69	1.39	3.710E-03	1120.28	15.040	6.098E-01	BI214
1461.97	578.	4.23	2.19	2.940E-03	1460.75	10.700	1.241E+01	K40
1766.15	38.	18.61	0.69	2.481E-03	1764.51	15.920	6.457E-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	
148.55	74.72	483.	170.	0.085	59.37	1.005	BI-207	D
154.13	77.50	384.	400.	0.200	25.61	1.007	PB-214	D
175.17	88.38	391.	121.	0.061	74.19	1.014	PB-214	lD
178.82	90.21	401.	73.	0.037	121.17	1.015	PB-214	lD
418.74	209.53	257.	94.	0.047	81.76	1.336	AC-228	sM
477.68	239.02	149.	692.	0.346	13.64	1.122	PB-212	D
483.82	242.09	206.	101.	0.050	67.53	1.124	PB-214	D
540.43	270.35	206.	92.	0.046	80.66	1.068	AC-228	s
601.66	300.96	164.	65.	0.033	98.50	0.696	PB-212	s
1592.36	796.07	36.	36.	0.018	100.00	1.084	PA-234	l
1931.65	965.62	27.	39.	0.019	75.23	1.614	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
PB-212	149.50	74.96	1198.	135.	0.067	107.69	1.499
PB-212	153.79	77.11	957.	388.	0.194	37.05	1.499D
PB-214	153.79	77.11	960.	385.	0.192	37.05	1.499D
TH-234	186.16	93.29	883.	176.	0.088	72.49	1.499s
RA-226	372.10	186.22	494.	110.	0.055	90.59	1.499s
PB-212	477.64	238.97	437.	569.	0.284	19.78	1.499
PB-214	477.55	238.92	373.	449.	0.225	23.05	1.499s
PB-214	590.99	295.62	207.	170.	0.085	42.21	1.499
AC-228	677.01	338.61	194.	145.	0.072	54.87	1.054
PB-214	704.45	352.33	119.	319.	0.159	22.05	1.499
TL-208	1023.37	511.72	108.	95.	0.047	54.05	1.721s
TL-208	1167.57	583.78	71.	230.	0.115	27.37	1.316s
BI-214	1219.53	609.75	84.	241.	0.121	28.51	1.416
BI-212	1456.32	728.08	32.	55.	0.027	62.63	1.260s
AC-228	1824.64	912.14	44.	139.	0.070	35.04	1.383
AC-228	1938.21	968.90	54.	54.	0.027	69.64	1.616D
BI-214	2241.40	1120.40	58.	50.	0.025	92.08	1.391
K-40	2924.95	1461.97	9.	575.	0.288	12.69	2.188

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
BI-214	3533.74	1766.15	4.	38.	0.019	55.82	0.691s

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		1.2336E-01					
			477.56	1.234E-01	%(	3.935E-01	1.17E-01 G
K-40		1.2411E+01					
			1460.75	1.241E+01	(P	3.529E-01	5.27E-01 G
MN-54		-8.1962E-04					
			834.81	-8.196E-04	%(P	4.231E-02	1.16E-02 G
CO-57		5.6023E-03					
			122.07	5.602E-03	%(	4.567E-02	1.36E-02 G K
			136.43	3.299E-03	%	4.262E-01	1.27E-01 G
CO-60		7.5551E-04					
			1332.51	7.555E-04	%(P	5.244E-02	1.42E-02 G K
			1173.23	2.318E-03	% P	6.044E-02	1.69E-02 G K
Sr-85		-1.4813E-02					
			514.00	-1.481E-02	%(	5.838E-02	1.73E-02 G
Kr-85		-3.4856E+02					
			513.99	-3.486E+02	%(P	1.281E+03	3.79E+02 G
Y-88		0.0000E+00					
			1836.01	0.000E+00	&(	6.595E-02	1.76E-02 G K
			898.02	5.434E-05	% P	5.163E-02	1.43E-02 G
NB-94		-1.4382E-03					
			871.10	-1.438E-03	&(P	4.280E-02	1.18E-02 G K
			702.50	1.481E-02	& P	3.627E-02	1.09E-02 G K
Ag-108M		1.4598E-03					
			722.95	1.460E-03	&(	7.365E-02	2.13E-02 G K
			614.37	-7.060E-03	% P	5.674E-02	1.65E-02 G
			433.93	9.039E-04	&	4.114E-02	1.18E-02 G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CD-109	-4.4171E-02						
		88.04	-4.417E-02	%(P	1.494E+00	4.46E-01	G
SN-113	1.6170E-02						
		391.71	1.617E-02	&(	5.511E-02	1.64E-02	G K
		255.04	1.559E-01	% P	1.868E+00	5.51E-01	G
SB-125	-3.5485E-03						
		427.95	-3.549E-03	%(P	1.323E-01	3.81E-02	G K
		600.77	-3.324E-04	% P	1.679E-01	4.62E-02	G
		636.15	6.501E-02	% P	3.469E-01	1.00E-01	G
		463.51	2.350E-01	% P	4.221E-01	1.29E-01	G
		176.29	-8.951E-02	% P	6.297E-01	1.87E-01	G
I-131	5.5946E-03						
		364.48	5.595E-03	&(	6.700E-02	1.95E-02	G K
		636.97	2.132E-01	%	7.893E-01	2.31E-01	G
		284.29	5.500E-02	&	9.569E-01	2.81E-01	G
CS-134	-1.4824E-02						
		604.66	-1.482E-02	%(P	4.969E-02	1.47E-02	G K
		795.76	2.964E-02	% P	4.474E-02	1.40E-02	G
		569.29	3.056E-02	% P	2.461E-01	7.06E-02	G
		801.84	-8.064E-02	%	4.681E-01	1.34E-01	G
CS-137	-8.6807E-03						
		661.62	-8.681E-03	%(P	5.020E-02	1.44E-02	G
CE-139	-1.3019E-02						
		165.85	-1.302E-02	&(P	4.918E-02	1.48E-02	G
EU-152	1.7909E-02						
		121.78	1.791E-02	%(P	1.390E-01	4.15E-02	G K
		344.30	-2.903E-02	% P	1.399E-01	4.13E-02	G
		1408.08	7.818E-02	% P	1.863E-01	5.56E-02	G
		964.00	-4.250E-02	& P	5.046E-01	1.45E-01	G
		1112.07	8.912E-02	& P	3.985E-01	1.15E-01	G
		778.90	-3.164E-03	% P	3.062E-01	8.45E-02	G
EU-154	-4.4806E-02						
		123.10	-4.481E-02	%(P	1.064E-01	3.22E-02	G K
		1274.80	-1.283E-04	& P	1.881E-01	5.23E-02	G
		723.30	-1.573E-02	& P	4.024E-01	1.17E-01	G
		1004.80	1.152E-01	& P	2.755E-01	8.27E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
EU-155	-3.0144E-03						
		86.45	-3.014E-03	%(	1.638E-01	4.88E-02	G K
		105.31	2.242E-02	%	2.034E-01	6.08E-02	G
HG-203	2.6197E-02						
		279.17	2.620E-02	%(	4.488E-02	1.37E-02	G K
		72.87	3.218E-03	% P	1.522E+00	4.56E-01	G
		70.83	-1.457E+00	%	2.065E+00	6.32E-01	G
		82.50	-7.573E-01	%	2.421E+00	7.30E-01	G
TL-208	2.7219E-01						
		583.14	2.722E-01	@(P	4.945E-02	2.51E-02	G
		510.72	3.760E-01	+ P	2.037E-01	7.93E-02	G
PB-212	5.7550E-01						
		238.63	5.753E-01	(P	1.013E-01	3.83E-02	G K
							Energy duplication
		77.11	8.761E-01	+	3.312E-01	1.08E-01	G
		74.81	5.762E-01	&(P	7.013E-01	2.15E-01	G
PB-214	5.1007E-01						
		351.99	5.337E-01	(P	8.976E-02	3.95E-02	G K
		295.22	4.645E-01	(P	1.910E-01	6.60E-02	G
							Energy duplication
		77.11	1.419E+00	+ P	5.427E-01	1.77E-01	G
		241.92	2.651E+00	+ P	5.471E-01	2.04E-01	G
BI-212	5.7964E-01						
		727.17	5.796E-01	*(P	3.081E-01	1.23E-01	G K
		1620.56	3.002E-01	%	1.583E+00	4.37E-01	G
		785.42	3.300E-01	% P	2.576E+00	7.41E-01	G
BI-214	5.8421E-01						
		609.32	5.546E-01	(P	1.041E-01	5.30E-02	G K
		1764.51	6.457E-01	(P	2.153E-01	1.22E-01	G
		1120.28	6.098E-01	(P	4.643E-01	1.89E-01	G
RA-224	2.3825E-01						
		241.00	2.382E-01	%(P	8.746E-01	2.61E-01	G
RA-226	1.2225E+00						
		185.99	1.222E+00	(	1.184E+00	3.69E-01	G
AC-228	7.2941E-01						
		911.07	7.327E-01	(P	1.768E-01	8.68E-02	G K
		968.90	4.985E-01	- P	3.412E-01	1.17E-01	G
		338.40	7.214E-01	(P	3.370E-01	1.34E-01	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments

TH-227      -1.4315E-01
                          236.00-1.432E-01 %(P 4.398E-01 1.32E-01 G K
                          256.25 5.834E-02 & P 5.628E-01 1.66E-01 G

PA-234      -7.5579E-02
                           98.44-7.558E-02 %(  1.577E-01 4.78E-02 G K
                          946.00-5.415E-02 %   2.703E-01 7.83E-02 G
                          131.28-4.599E-03 &   2.077E-01 6.18E-02 G
                           94.67-9.193E-02 %   2.910E-01 8.77E-02 G
                          883.24-1.228E-03 %   3.943E-01 1.10E-01 G
                          926.70-7.161E-02 %   4.528E-01 1.30E-01 G
                          569.26 2.975E-02 %   3.684E-01 1.05E-01 G

TH-234       1.4375E+00
                                                          Energy duplication
                           63.29 1.003E+00 %(P 2.139E+00 6.47E-01 G K
                           92.80 2.002E+00 *(P 1.607E+00 5.01E-01 G
                           92.38 5.288E-02 & P 1.776E+00 5.27E-01 G

AM-241       6.5112E-03
                           59.54 6.511E-03 %(P 2.344E-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	1.1542E-01	1.2336E-01	3.5087E-01	3.5094E-01	3.682E-01
K-40		1.2411E+01	1.2411E+01	1.5813E+00	1.7298E+00	
MN-54	#A	-8.1036E-04	-8.1962E-04	2.2183E-01	2.2183E-01	4.183E-02
CO-57	#B	5.5291E-03	5.6023E-03	4.0877E-02	4.0878E-02	4.507E-02
CO-60	#B	7.5412E-04	7.5551E-04	4.2607E-02	4.2607E-02	5.234E-02
Sr-85	#A	-1.4024E-02	-1.4813E-02	5.2031E-02	5.2038E-02	5.527E-02
Kr-85	#A	-3.4855E+02	-3.4856E+02	1.3102E+03	1.3103E+03	1.281E+03
Y-88	#B	0.0000E+00	0.0000E+00	5.2749E-02	5.2749E-02	6.378E-02
NB-94	#B	-1.4382E-03	-1.4382E-03	4.6683E-02	4.6683E-02	4.280E-02
Ag-108M	#B	1.4597E-03	1.4598E-03	6.3811E-02	6.3811E-02	7.364E-02
CD-109	#A	-4.3827E-02	-4.4171E-02	1.6323E+00	1.6323E+00	1.482E+00
SN-113	#B	1.5679E-02	1.6170E-02	4.9109E-02	4.9117E-02	5.343E-02
SB-125	#B	-3.5361E-03	-3.5485E-03	1.8416E-01	1.8416E-01	1.318E-01
I-131	#B	3.5973E-03	5.5946E-03	5.8495E-02	5.8496E-02	4.308E-02
CS-134	#B	-1.4754E-02	-1.4824E-02	4.8171E-02	4.8178E-02	4.945E-02
CS-137	#A	-8.6779E-03	-8.6807E-03	5.6858E-02	5.6860E-02	5.019E-02
CE-139	#A	-1.2687E-02	-1.3019E-02	4.5248E-02	4.5254E-02	4.793E-02
EU-152	#B	1.7895E-02	1.7909E-02	1.2454E-01	1.2455E-01	1.389E-01
EU-154	#B	-4.4755E-02	-4.4806E-02	9.9667E-02	9.9698E-02	1.063E-01
EU-155	#B	-3.0085E-03	-3.0144E-03	1.4655E-01	1.4655E-01	1.635E-01
HG-203	#B	2.4275E-02	2.6197E-02	4.1168E-02	4.1194E-02	4.159E-02
TL-208	#	2.7219E-01	2.7219E-01	7.5262E-02	7.6818E-02	
PB-212	#	5.7550E-01	5.7550E-01	1.1506E-01	1.1957E-01	1.013E-01
PB-214	#	5.1007E-01	5.1007E-01	1.1316E-01	1.1677E-01	8.976E-02
BI-212	#	5.7964E-01	5.7964E-01	3.6752E-01	3.6897E-01	
BI-214		5.8421E-01	5.8421E-01	1.6735E-01	1.7057E-01	
RA-224	A	2.3825E-01	2.3825E-01	7.8349E-01	7.8361E-01	8.746E-01
RA-226	#	1.2225E+00	1.2225E+00	1.1075E+00	1.1096E+00	1.184E+00
AC-228		7.2941E-01	7.2941E-01	2.4092E-01	2.4442E-01	
TH-227	#B	-1.4315E-01	-1.4315E-01	4.0645E-01	4.0653E-01	4.398E-01
PA-234	#B	-7.5579E-02	-7.5579E-02	1.4350E-01	1.4356E-01	1.577E-01
TH-234	#B	1.4375E+00	1.4375E+00	1.0786E+00	1.0815E+00	2.139E+00
AM-241	#A	6.5110E-03	6.5112E-03	2.0823E-01	2.0823E-01	2.344E-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) 1.4576412E+01 pCi/gm
Total Decayed Activity (1120.2 to 1999.1 keV) 1.4576412E+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_7AUG2006_1655.An1

Sample description
FSS-OOL-10-04-021-F

Spectrum Filename: C:\GammaVision\Spectra\101F_7AUG2006_1655.An1

Acquisition information

Start time:	07-Aug-2006 16:55:44
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:	2.0530E+03
Activity scaling factor:	1.0000E+06/(1.0000E+00* 2.0530E+03) = 4.8709E+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	27-Jul-2006 08:21:00
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: 0.4368

***** 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	220.	22.33	1.50	1.654E-02	70.83	3.520	3.215E+00	HG203
					74.81	9.600	9.102E-01	PB212
77.14	273.	18.01	1.50	1.720E-02	77.11	10.700	9.745E-01	PB214
					77.11	17.500	5.958E-01	PB212
77.14	276.	18.01	1.50	1.720E-02	77.11	10.700	9.745E-01	PB214
					77.11	17.500	6.040E-01	PB212
87.44	127.	23.14	1.01	1.927E-02				
87.44	127.	23.14	1.01	1.927E-02	88.04	3.790	PBC<MDA	CD109
90.00	109.	27.96	1.02	1.960E-02				
93.10	123.	23.14	1.02	1.995E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
186.27	152.	22.99	1.43	1.857E-02	185.99	3.280	1.636E+00	RA226
209.81	105.	26.02	1.98	1.719E-02				
238.99	721.	4.42	1.12	1.556E-02	238.63	43.100	7.014E-01	PB212
241.53	109.	23.19	1.12	1.543E-02				
241.53	109.	23.19	1.12	1.543E-02	241.92	7.470	PBC<MDA	PB214
276.75	46.	41.24	1.12	1.371E-02				
295.61	214.	11.72	1.01	1.290E-02	295.22	19.200	5.642E-01	PB214
328.57	89.	30.57	0.89	1.168E-02				
338.64	151.	16.18	1.16	1.134E-02	338.40	12.010	7.167E-01	AC228
352.26	364.	9.20	1.14	1.092E-02	351.99	37.100	5.888E-01	PB214
463.87	50.	33.39	0.80	8.335E-03	463.51	10.000	3.829E-01	SB125
511.44	86.	20.26	1.39	7.580E-03	510.72	22.500	2.689E-01	TL208
583.69	243.	10.59	1.43	6.679E-03	583.14	86.000	2.752E-01	TL208
609.78	245.	8.71	1.09	6.408E-03	609.32	46.090	5.432E-01	BI214
662.29	90.	18.77	1.36	5.932E-03	661.62	84.620	1.168E-01	CS137
727.78	38.	34.67	1.32	5.439E-03	727.17	11.800	PBC<MDA	BI212

911.98	149.	10.94	1.64	4.443E-03	911.07	29.000	7.521E-01	AC228
969.25	103.	21.82	1.56	4.211E-03	968.90	17.460	9.172E-01	AC228
1121.24	59.	25.87	1.55	3.708E-03	1120.28	15.040	6.925E-01	BI214
1239.32	53.	33.84	0.68	3.399E-03				
1461.87	594.	4.20	1.84	2.940E-03	1460.75	10.700	1.236E+01	K40
1765.50	39.	16.01	3.33	2.481E-03	1764.51	15.920	6.426E-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
174.46	87.65	368.	127.	0.063	69.43	1.014	PB-214 lD
179.58	90.21	407.	109.	0.054	83.89	1.016	PB-214 lD
419.30	209.81	293.	105.	0.053	78.06	1.984	NP-239 sM
477.68	238.90	147.	721.	0.361	13.25	1.122	PB-212 D
482.75	241.44	262.	109.	0.054	69.58	1.124	RA-224 D
656.91	328.57	210.	89.	0.045	91.70	0.887	RH-106M s
1455.71	727.78	50.	37.	0.019	94.55	1.322	J-132
2479.38	1239.32	73.	53.	0.027	101.51	0.684	CO-56 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	149.23	74.83	1153.	220.	0.110	66.99	1.499
PB-214	153.79	77.11	1103.	273.	0.136	54.03	1.499D
PB-212	153.79	77.11	1100.	276.	0.138	54.03	1.499D
TH-234	185.93	93.18	933.	126.	0.063	100.90	1.499s
RA-226	372.20	186.27	424.	152.	0.076	68.96	1.426s
PB-212	477.66	238.98	448.	549.	0.274	20.50	1.499
PB-214	483.12	241.71	511.	81.	0.041	121.45	1.499
PB-214	590.98	295.62	194.	208.	0.104	34.77	1.499
AC-228	677.06	338.64	161.	148.	0.074	48.55	1.156
PB-214	704.37	352.28	159.	292.	0.146	25.20	1.499s
SB-125	927.14	463.62	76.	51.	0.026	80.75	1.499s
TL-208	1022.82	511.44	99.	70.	0.035	60.77	1.389
TL-208	1167.39	583.69	110.	240.	0.120	31.78	1.432
BI-214	1219.60	609.78	71.	244.	0.122	26.12	1.087
CS-137	1324.67	662.29	64.	89.	0.045	56.30	1.360
AC-228	1824.32	911.98	40.	147.	0.074	32.82	1.645
AC-228	1938.91	969.25	93.	102.	0.051	65.46	1.556
BI-214	2243.07	1121.24	53.	59.	0.029	77.60	1.545
K-40	2924.75	1461.87	9.	591.	0.296	12.59	1.844
BI-214	3532.44	1765.50	0.	39.	0.019	48.04	3.331s

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		9.4507E-02					
			477.56	9.451E-02	%(	4.291E-01 1.26E-01	G
K-40		1.2363E+01					
			1460.75	1.236E+01	(P	3.437E-01 5.21E-01	G
MN-54		-5.8702E-04					
			834.81	-5.870E-04	%(P	5.171E-02 1.45E-02	G
CO-57		0.0000E+00					
			122.07	0.000E+00	%(	4.971E-02 1.48E-02	G K
			136.43	-5.280E-02	%	3.938E-01 1.18E-01	G
CO-60		2.5366E-03					
			1332.51	2.537E-03	%(P	3.784E-02 1.00E-02	G K
			1173.23	2.075E-02	% P	5.719E-02 1.70E-02	G K
Sr-85		-1.2263E-02					
			514.00	-1.226E-02	%(	5.598E-02 1.65E-02	G
Kr-85		-2.7560E+02					
			513.99	-2.756E+02	%(P	1.150E+03 3.38E+02	G
Y-88		0.0000E+00					
			1836.01	0.000E+00	%(	7.971E-02 2.17E-02	G K
			898.02	2.027E-02	& P	3.904E-02 1.20E-02	G
NB-94		6.3641E-03					
			871.10	6.364E-03	%(P	4.137E-02 1.18E-02	G K
			702.50	1.304E-02	& P	3.846E-02 1.14E-02	G K
Ag-108M		8.9786E-03					
			722.95	8.979E-03	%(	3.484E-02 1.01E-02	G K
			614.37	-1.968E-02	% P	5.511E-02 1.65E-02	G
			433.93	-6.953E-03	&	4.099E-02 1.20E-02	G
CD-109		-2.3757E-02					
			88.04	-2.376E-02	%(P	1.474E+00 4.40E-01	G
SN-113		8.0369E-03					
			391.71	8.037E-03	%(	5.874E-02 1.72E-02	G K
			255.04	-3.409E-02	& P	1.806E+00 5.30E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	1.0194E-01						
		427.95	-1.325E-03	%(P	1.191E-01	3.41E-02	G K
		600.77	-1.260E-03	& P	2.174E-01	6.13E-02	G
		636.15	-1.297E-02	% P	4.744E-01	1.36E-01	G
		463.51	4.076E-01	(P	3.440E-01	1.13E-01	G
		176.29	-6.290E-02	% P	6.276E-01	1.86E-01	G
I-131	-2.4226E-02						
		364.48	-2.423E-02	%(	1.240E-01	3.66E-02	G K
		636.97	5.633E-01	&	1.397E+00	4.19E-01	G
		284.29	3.187E-01	&	1.316E+00	3.90E-01	G
CS-134	-1.6761E-02						
		604.66	-1.676E-02	%(P	4.811E-02	1.43E-02	G K
		795.76	3.214E-02	% P	5.019E-02	1.56E-02	G
		569.29	-1.869E-03	% P	2.793E-01	7.94E-02	G
		801.84	1.520E-01	%	4.566E-01	1.35E-01	G
CS-137	1.1683E-01						
		661.62	1.168E-01	(P	5.238E-02	2.22E-02	G
CE-139	6.0883E-03						
		165.85	6.088E-03	%(P	4.722E-02	1.41E-02	G
EU-152	-5.4849E-02						
		121.78	-5.485E-02	%(P	1.432E-01	4.32E-02	G K
		344.30	1.400E-02	% P	1.313E-01	3.84E-02	G
		1408.08	5.565E-02	& P	1.976E-01	5.66E-02	G
		964.00	4.598E-03	& P	4.616E-01	1.31E-01	G
		1112.07	-1.410E-03	& P	5.148E-01	1.45E-01	G
		778.90	4.995E-02	& P	3.234E-01	9.26E-02	G
EU-154	3.0875E-02						
		123.10	3.088E-02	&(P	9.423E-02	2.84E-02	G K
		1274.80	-1.015E-03	& P	1.508E-01	4.12E-02	G
		723.30	-4.939E-02	& P	2.522E-01	7.33E-02	G
		1004.80	1.909E-02	& P	2.619E-01	7.31E-02	G
EU-155	4.2867E-02						
		86.45	4.287E-02	%(	1.323E-01	3.98E-02	G K
		105.31	6.150E-02	%	1.988E-01	5.99E-02	G
HG-203	-1.0146E-02						
		279.17	-1.015E-02	&(	5.383E-02	1.60E-02	G K
		72.87	-2.726E-01	% P	1.229E+00	3.69E-01	G
		70.83	-2.674E-02	%	2.217E+00	6.61E-01	G
		82.50	-8.213E-01	%	2.894E+00	8.72E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	2.7388E-01						
		583.14	2.752E-01	(P	5.898E-02	2.95E-02	G
		510.72	2.689E-01	(P	1.894E-01	6.71E-02	G
PB-212	5.5711E-01						
		238.63	5.381E-01	(P	9.933E-02	3.72E-02	G K
							Energy duplication
		77.11	6.040E-01	(	3.438E-01	1.09E-01	G
		74.81	9.102E-01	& P	6.672E-01	2.08E-01	G
PB-214	4.9658E-01						
		351.99	4.736E-01	@(P	9.990E-02	4.00E-02	G K
		295.22	5.532E-01	(P	1.792E-01	6.47E-02	G
							Energy duplication
		77.11	9.745E-01	+ P	5.632E-01	1.78E-01	G
		241.92	4.653E-01	(P	6.182E-01	1.90E-01	G
BI-212	-1.0327E-03						
		727.17	-1.033E-03	%(P	3.938E-01	1.11E-01	G K
		1620.56	0.000E+00	&	1.906E+00	5.05E-01	G
		785.42	1.076E-01	% P	1.769E+00	4.90E-01	G
BI-214	5.9285E-01						
		609.32	5.432E-01	(P	9.355E-02	4.75E-02	G K
		1764.51	6.426E-01	(P	1.228E-01	1.04E-01	G
		1120.28	6.925E-01	(P	4.331E-01	1.80E-01	G
RA-224	-6.7537E-02						
		241.00	-6.754E-02	%(P	2.971E-01	8.41E-02	G
RA-226	1.6361E+00						
		185.99	1.636E+00	@(	1.066E+00	3.76E-01	G
AC-228	7.9413E-01						
		911.07	7.521E-01	(P	1.637E-01	8.34E-02	G K
		968.90	9.172E-01	(P	4.254E-01	2.02E-01	G
		338.40	7.167E-01	(P	2.982E-01	1.18E-01	G
TH-227	1.1105E-01						
		236.00	1.111E-01	%(P	2.549E-01	7.70E-02	G K
		256.25	1.049E-01	& P	5.174E-01	1.54E-01	G
PA-234	-2.9048E-02						
		98.44	-2.905E-02	%(	1.795E-01	5.38E-02	G K
		946.00	-4.010E-04	&	2.783E-01	7.82E-02	G
		131.28	8.953E-02	&	1.792E-01	5.44E-02	G
		94.67	-9.996E-02	%	3.184E-01	9.60E-02	G
		883.24	0.000E+00	%	3.945E-01	1.10E-01	G
		926.70	-6.465E-02	%	4.365E-01	1.25E-01	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26-2.434E-02 %   4.321E-01 1.24E-01 G

TH-234       8.7684E-01
                           63.29 4.796E-01 %(P 2.128E+00 6.38E-01 G K
                           92.80 1.393E+00  (P 1.600E+00 4.92E-01 G
                           92.38-3.020E-02 % P 1.931E+00 5.74E-01 G

AM-241      -1.5191E-02
                           59.54-1.519E-02 &(P 2.924E-01 8.71E-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	8.1553E-02	9.4507E-02	3.7850E-01	3.7854E-01	3.703E-01
K-40		1.2363E+01	1.2363E+01	1.5623E+00	1.7114E+00	
MN-54	#A	-5.7240E-04	-5.8702E-04	3.6298E-02	3.6298E-02	5.042E-02
CO-57	#B	0.0000E+00	0.0000E+00	4.4334E-02	4.4334E-02	4.828E-02
CO-60	#B	2.5263E-03	2.5366E-03	3.0077E-02	3.0078E-02	3.768E-02

Sr-85	#A	-1.0861E-02	-1.2263E-02	4.9629E-02	4.9634E-02	4.958E-02
Kr-85	#A	-2.7558E+02	-2.7560E+02	1.2076E+03	1.2077E+03	1.149E+03
Y-88	#B	0.0000E+00	0.0000E+00	6.5213E-02	6.5213E-02	7.404E-02
NB-94	#B	6.3641E-03	6.3641E-03	3.5294E-02	3.5295E-02	4.137E-02
Ag-108M	#B	8.9771E-03	8.9786E-03	3.0273E-02	3.0278E-02	3.484E-02
CD-109	#A	-2.3348E-02	-2.3757E-02	1.9009E+00	1.9009E+00	1.449E+00
SN-113	#B	7.5056E-03	8.0369E-03	5.1517E-02	5.1519E-02	5.486E-02
SB-125	#B	1.0115E-01	1.0194E-01	8.4643E-02	8.4839E-02	1.182E-01
I-131	#B	-9.1001E-03	-2.4226E-02	1.0992E-01	1.0993E-01	4.659E-02
CS-134	#B	-1.6587E-02	-1.6761E-02	4.6339E-02	4.6348E-02	4.761E-02
CS-137		1.1675E-01	1.1683E-01	6.6434E-02	6.6761E-02	
CE-139	#A	5.7495E-03	6.0883E-03	4.2185E-02	4.2186E-02	4.460E-02
EU-152	#B	-5.4756E-02	-5.4849E-02	1.3371E-01	1.3374E-01	1.430E-01
EU-154	#B	3.0797E-02	3.0875E-02	8.5131E-02	8.5148E-02	9.400E-02
EU-155	#B	4.2681E-02	4.2867E-02	1.1952E-01	1.1955E-01	1.317E-01
HG-203	#B	-8.5687E-03	-1.0146E-02	4.7944E-02	4.7948E-02	4.546E-02
TL-208		2.7388E-01	2.7388E-01	8.7910E-02	8.9262E-02	
PB-212	#	5.5711E-01	5.5711E-01	1.1549E-01	1.1970E-01	9.933E-02
PB-214	#	4.9658E-01	4.9658E-01	1.2598E-01	1.2907E-01	9.990E-02
BI-212	#B	-1.0327E-03	-1.0327E-03	4.4820E-01	4.4820E-01	3.938E-01
BI-214		5.9285E-01	5.9285E-01	1.5555E-01	1.5912E-01	
RA-224	#A	-6.7537E-02	-6.7537E-02	3.1831E-01	3.1833E-01	2.971E-01
RA-226	#	1.6361E+00	1.6361E+00	1.1283E+00	1.1320E+00	
AC-228		7.9413E-01	7.9413E-01	2.3495E-01	2.3919E-01	
TH-227	#B	1.1105E-01	1.1105E-01	2.3098E-01	2.3106E-01	2.549E-01
PA-234	#B	-2.9048E-02	-2.9048E-02	1.6132E-01	1.6133E-01	1.795E-01
TH-234	#B	8.7684E-01	8.7684E-01	9.2800E-01	9.2927E-01	2.128E+00
AM-241	#A	-1.5190E-02	-1.5191E-02	3.3529E-01	3.3529E-01	2.923E-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) 1.5776236E+01 pCi/gm
Total Decayed Activity (276.6 to 1999.1 keV) 1.5776341E+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_8AUG2006_1900.An1

Sample description
FSS-OOL-10-04-017-F

Spectrum Filename: C:\GammaVision\Spectra\101F_8AUG2006_1900.An1

Acquisition information
Start time: 08-Aug-2006 19:00:41
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: 2.1360E+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	27-Jul-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. 16 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.4867

***** 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	154.	23.12	1.00	1.651E-02	72.87	6.400	PBC<MDA	HG203
					74.81	9.600	PBC<MDA	PB212
77.27	442.	7.89	1.01	1.730E-02	77.11	10.700	1.507E+00	PB214
					77.11	17.500	9.294E-01	PB212
83.82	85.	32.48	1.01	1.864E-02				
87.31	168.	17.63	1.01	1.920E-02				
89.96	109.	26.47	1.02	1.955E-02	88.04	3.790	PBC<MDA	CD109
93.43	131.	23.21	1.02	1.994E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
128.86	113.	32.90	0.94	2.110E-02				
186.11	114.	27.78	1.52	1.858E-02	185.99	3.280	1.186E+00	RA226
209.48	119.	29.17	1.54	1.720E-02				
238.92	799.	4.11	1.12	1.556E-02	238.63	43.100	7.470E-01	PB212
					241.92	7.470	4.389E+00	PB214
239.00	401.	9.24	1.50	1.540E-02	238.63	43.100	PBC<MDA	PB212
					241.92	7.470	2.203E+00	PB214
242.43	89.	23.79	1.12	1.538E-02				
270.16	95.	24.83	1.04	1.401E-02				
277.79	73.	28.31	1.71	1.366E-02				
295.55	193.	11.84	1.05	1.291E-02	295.22	19.200	4.877E-01	PB214
300.56	48.	34.86	1.34	1.271E-02				
338.76	137.	18.48	0.99	1.134E-02	338.40	12.010	6.257E-01	AC228
352.41	316.	7.98	1.18	1.091E-02	351.99	37.100	4.894E-01	PB214
511.24	116.	16.54	1.10	7.583E-03	510.72	22.500	3.703E-01	TL208
583.71	279.	8.45	1.37	6.678E-03	583.14	86.000	3.049E-01	TL208
609.93	216.	9.96	0.94	6.407E-03	609.32	46.090	4.604E-01	BI214
728.00	44.	27.09	0.71	5.437E-03	727.17	11.800	4.277E-01	BI212

795.07	47.	26.58	1.71	5.020E-03				
795.07	47.	26.58	1.71	5.020E-03	795.76	85.400	6.989E-02	CS134
912.04	134.	9.54	1.90	4.442E-03	911.07	29.000	6.473E-01	AC228
965.72	27.	34.49	1.61	4.231E-03	964.00	14.580	PBC<MDA	EU152
969.97	85.	17.07	1.73	4.208E-03	968.90	17.460	7.276E-01	AC228
1121.10	56.	19.44	1.94	3.708E-03	1120.28	15.040	6.350E-01	BI214
1461.88	582.	4.25	1.70	2.940E-03	1460.75	10.700	1.165E+01	K40
1621.19	13.	27.74	2.00	2.682E-03	1620.56	2.750	1.115E+00	BI212

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
1766.05	17.	30.50	2.11	2.481E-03	1764.51	15.920	2.778E-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	
148.61	74.72	554.	154.	0.077	69.35	1.005	BI-207	D
154.10	77.46	388.	442.	0.221	23.67	1.007	PB-214	D
167.22	83.67	343.	85.	0.043	97.43	1.011	TA-182	lD
174.26	87.15	357.	131.	0.065	66.62	1.014	PB-214	D
179.49	89.80	361.	109.	0.054	79.42	1.016	PB-214	lD
257.33	128.86	552.	115.	0.057	91.26	0.940	AC-228	sM
418.64	209.48	403.	119.	0.060	87.51	1.537	AC-228	sM
484.56	242.34	178.	89.	0.044	71.36	1.124	XE-138	lD
540.04	270.16	190.	95.	0.047	74.48	1.038	AC-228	
600.88	300.56	116.	48.	0.024	104.58	1.339	PB-212	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	149.43	74.93	1280.	152.	0.076	99.50	1.499
PB-214	153.79	77.11	1023.	370.	0.185	39.46	1.499D
PB-212	153.79	77.11	1019.	373.	0.187	39.46	1.499D
TH-234	186.08	93.25	1006.	135.	0.067	98.31	1.499s
RA-226	372.59	186.47	543.	97.	0.048	106.94	1.499s
PB-212	477.56	238.93	399.	658.	0.329	17.20	1.499
RA-224	483.23	241.77	470.	98.	0.049	98.38	1.499
PB-214	477.70	239.00	487.	401.	0.200	27.72	1.499s
PB-214	590.95	295.60	192.	192.	0.096	37.08	1.499s
AC-228	677.30	338.76	182.	135.	0.067	55.44	0.989
PB-214	704.55	352.38	141.	293.	0.146	24.35	1.499
TL-208	1022.42	511.24	100.	100.	0.050	49.61	1.100s
TL-208	1167.43	583.71	84.	277.	0.139	25.34	1.366
BI-214	1219.89	609.93	81.	215.	0.108	29.88	0.945
BI-212	1456.15	728.00	44.	43.	0.022	81.28	0.708s
CS-134	1591.11	795.44	33.	39.	0.019	78.19	1.502s
AC-228	1824.42	912.04	15.	132.	0.066	28.61	1.904s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
EU-152	1931.86	965.72	32.	27.	0.014	103.46	1.612s
AC-228	1940.36	969.97	44.	85.	0.042	51.21	1.735
BI-214	2242.79	1121.10	27.	56.	0.028	58.33	1.937
K-40	2924.79	1461.88	9.	580.	0.290	12.75	1.697
BI-212	3243.62	1621.19	0.	13.	0.007	83.21	1.999
BI-214	3533.55	1766.05	6.	17.	0.009	91.51	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		1.3375E-01					
			477.56	1.338E-01	%(	3.429E-01 1.03E-01 G	
K-40		1.1653E+01					
			1460.75	1.165E+01	(P	3.366E-01 4.97E-01 G	
MN-54		-5.6559E-04					
			834.81	-5.656E-04	&(P	3.500E-02 9.43E-03 G	
CO-57		1.2607E-02					
			122.07	1.261E-02	%(	4.421E-02 1.33E-02 G K	
			136.43	-7.047E-02	&	3.892E-01 1.17E-01 G	
CO-60		8.7073E-03					
			1332.51	8.707E-03	&(P	5.376E-02 1.52E-02 G K	
			1173.23	1.494E-02	& P	5.600E-02 1.63E-02 G K	
Sr-85		-1.1210E-02					
			514.00	-1.121E-02	%(	5.427E-02 1.60E-02 G	
Kr-85		-2.5351E+02					
			513.99	-2.535E+02	%(P	1.102E+03 3.24E+02 G	
Y-88		-3.3248E-03					
			1836.01	-3.325E-03	%(	5.311E-02 1.41E-02 G K	
			898.02	-3.826E-03	& P	4.929E-02 1.38E-02 G	
NB-94		2.4552E-03					
			871.10	2.455E-03	&(P	3.431E-02 9.45E-03 G K	
			702.50	1.443E-02	% P	4.131E-02 1.23E-02 G K	

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
Ag-108M	6.3751E-03						
		722.95	6.375E-03	&(	4.692E-02	1.35E-02	G K
		614.37	-1.459E-02	% P	5.416E-02	1.60E-02	G
		433.93	0.000E+00	%	4.366E-02	1.26E-02	G
CD-109	-2.0539E-02						
		88.04	-2.054E-02	%(P	1.382E+00	4.12E-01	G
SN-113	-7.3573E-03						
		391.71	-7.357E-03	&(	6.705E-02	1.97E-02	G K
		255.04	1.949E-02	& P	1.680E+00	4.92E-01	G
SB-125	-1.9001E-02						
		427.95	-1.900E-02	%(P	1.334E-01	3.90E-02	G K
		600.77	4.861E-02	& P	1.792E-01	5.25E-02	G
		636.15	-3.960E-02	% P	3.081E-01	8.76E-02	G
		463.51	2.210E-01	% P	3.788E-01	1.16E-01	G
		176.29	3.316E-02	% P	6.088E-01	1.81E-01	G
I-131	6.1943E-04						
		364.48	6.194E-04	&(	1.219E-01	3.52E-02	G K
		636.97	-1.990E-01	&	1.469E+00	4.22E-01	G
		284.29	-2.141E-01	&	1.810E+00	5.35E-01	G
CS-134	2.6885E-02						
		604.66	-5.457E-04	&(P	3.345E-02	9.25E-03	G K
		795.76	5.823E-02	@(P	4.430E-02	1.53E-02	G
		569.29	7.779E-02	% P	2.438E-01	7.22E-02	G
		801.84	6.393E-02	&	4.162E-01	1.18E-01	G
CS-137	2.2732E-04						
		661.62	2.273E-04	&(P	5.873E-02	1.68E-02	G
CE-139	1.5507E-02						
		165.85	1.551E-02	%(P	4.386E-02	1.32E-02	G
EU-152	9.1256E-02						
		121.78	-2.484E-03	%(P	1.235E-01	3.66E-02	G K
		344.30	5.900E-03	& P	1.259E-01	3.66E-02	G
		1408.08	4.001E-04	% P	2.136E-01	5.66E-02	G
		964.00	2.793E-01	&(P	2.990E-01	9.79E-02	G
		1112.07	-3.841E-02	& P	3.606E-01	1.01E-01	G
		778.90	9.155E-02	% P	2.791E-01	8.23E-02	G
EU-154	2.5343E-02						
		123.10	2.534E-02	%(P	9.698E-02	2.91E-02	G K
		1274.80	2.127E-02	% P	1.315E-01	3.70E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
		723.30	4.518E-03	& P	1.622E-01	4.45E-02	G
		1004.80	-6.422E-02	% P	2.869E-01	8.32E-02	G
EU-155	-3.3203E-04						
		86.45	-3.320E-04	&(	1.545E-01	4.61E-02	G K
		105.31	6.077E-02	%	1.877E-01	5.66E-02	G
HG-203	-1.6994E-02						
		279.17	-1.699E-02	&(	5.954E-02	1.78E-02	G K
		72.87	-3.433E-01	& P	1.365E+00	4.11E-01	G
		70.83	-4.460E-01	%	2.459E+00	7.39E-01	G
		82.50	-1.829E-01	&	2.732E+00	8.16E-01	G
TL-208	3.1845E-01						
		583.14	3.049E-01	(P	4.998E-02	2.60E-02	G
		510.72	3.703E-01	*(P	1.827E-01	7.11E-02	G
PB-212	6.1710E-01						
		238.63	6.200E-01	(P	9.029E-02	3.59E-02	G K
							Energy duplication
		77.11	7.846E-01	+	3.183E-01	1.03E-01	G
		74.81	6.039E-01	&(P	6.750E-01	2.07E-01	G
PB-214	4.6822E-01						
		351.99	4.572E-01	(P	9.061E-02	3.74E-02	G K
		295.22	4.895E-01	*(P	1.714E-01	6.11E-02	G
							Energy duplication
		77.11	1.270E+00	+ P	5.216E-01	1.69E-01	G
		241.92	2.203E+00	+ P	5.805E-01	2.04E-01	G
BI-212	4.2772E-01						
		727.17	4.277E-01	(P	3.297E-01	1.18E-01	G K
		1620.56	1.115E+00	+	6.322E-01	3.09E-01	G
		785.42	8.164E-01	% P	2.005E+00	6.00E-01	G
BI-214	4.6041E-01						
		609.32	4.604E-01	(P	9.552E-02	4.61E-02	G K
		1764.51	2.778E-01	& P	2.302E-01	8.69E-02	G
		1120.28	6.350E-01	+ P	3.051E-01	1.24E-01	G
RA-224	1.0239E+00						
		241.00	1.024E+00	(P	1.090E+00	3.38E-01	G
RA-226	1.0017E+00						
		185.99	1.002E+00	*(	1.156E+00	3.57E-01	G
AC-228	6.6685E-01						
		911.07	6.473E-01	(P	1.020E-01	6.27E-02	G K
		968.90	7.276E-01	(P	2.905E-01	1.25E-01	G
		338.40	6.257E-01	(P	3.045E-01	1.18E-01	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments

TH-227      -2.1790E-01
                          236.00-2.179E-01 %(P 4.232E-01 1.28E-01 G K
                          256.25-1.315E-02 & P 5.104E-01 1.50E-01 G

PA-234       9.8487E-02
                           98.44 9.849E-02 %(  1.687E-01 5.14E-02 G K
                          946.00-7.268E-03 &   2.340E-01 6.54E-02 G
                          131.28-6.706E-02 %   1.941E-01 5.85E-02 G
                           94.67-1.939E-03 %   3.088E-01 9.21E-02 G
                          883.24 0.000E+00 %   4.664E-01 1.32E-01 G
                          926.70-3.490E-02 &   3.845E-01 1.08E-01 G
                          569.26 1.180E-01 %   3.564E-01 1.06E-01 G

TH-234       1.0209E+00
                           63.29 7.055E-01 %(P 2.119E+00 6.38E-01 G K
                           92.80 1.431E+00 *(P 1.595E+00 4.90E-01 G
                           92.38-1.145E-01 % P 1.993E+00 5.92E-01 G

AM-241      -6.7212E-02
                           59.54-6.721E-02 %(P 2.817E-01 8.46E-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	1.1378E-01	1.3375E-01	3.0812E-01	3.0821E-01	2.917E-01
K-40		1.1653E+01	1.1653E+01	1.4915E+00	1.6303E+00	
MN-54	#A	-5.5016E-04	-5.6559E-04	2.3634E-02	2.3635E-02	3.405E-02
CO-57	#B	1.2211E-02	1.2607E-02	3.9874E-02	3.9880E-02	4.282E-02
CO-60	#B	8.6683E-03	8.7073E-03	4.5734E-02	4.5737E-02	5.352E-02
Sr-85	#A	-9.8119E-03	-1.1210E-02	4.8052E-02	4.8056E-02	4.750E-02
Kr-85	#A	-2.5349E+02	-2.5351E+02	1.1653E+03	1.1654E+03	1.102E+03
Y-88	#B	-3.0660E-03	-3.3248E-03	4.2266E-02	4.2266E-02	4.898E-02
NB-94	#B	2.4552E-03	2.4552E-03	2.8360E-02	2.8360E-02	3.431E-02
Ag-108M	#B	6.3739E-03	6.3751E-03	4.0477E-02	4.0479E-02	4.691E-02
CD-109	#A	-2.0151E-02	-2.0539E-02	1.8589E+00	1.8589E+00	1.356E+00
SN-113	#B	-6.8254E-03	-7.3573E-03	5.8990E-02	5.8991E-02	6.220E-02
SB-125	#B	-1.8840E-02	-1.9001E-02	1.2715E-01	1.2715E-01	1.323E-01
I-131	#B	2.1160E-04	6.1943E-04	1.0571E-01	1.0571E-01	4.164E-02
CS-134	#B	2.6578E-02	2.6885E-02	2.1245E-02	2.1299E-02	3.307E-02
CS-137	#A	2.2714E-04	2.2732E-04	5.0262E-02	5.0262E-02	5.869E-02
CE-139	#A	1.4563E-02	1.5507E-02	3.9633E-02	3.9642E-02	4.119E-02
EU-152	#B	9.1087E-02	9.1256E-02	9.6017E-02	9.6150E-02	1.232E-01
EU-154	#B	2.5273E-02	2.5343E-02	8.7408E-02	8.7419E-02	9.671E-02
EU-155	#B	-3.3045E-04	-3.3203E-04	1.3817E-01	1.3817E-01	1.538E-01
HG-203	#B	-1.4119E-02	-1.6994E-02	5.3503E-02	5.3511E-02	4.947E-02
TL-208		3.1845E-01	3.1845E-01	8.1378E-02	8.3344E-02	
PB-212	#	6.1710E-01	6.1710E-01	1.0715E-01	1.1268E-01	9.029E-02
PB-214	#	4.6822E-01	4.6822E-01	1.0475E-01	1.0804E-01	9.061E-02
BI-212		4.2772E-01	4.2772E-01	3.5309E-01	3.5392E-01	
BI-214		4.6041E-01	4.6041E-01	1.3826E-01	1.4069E-01	
RA-224	A	1.0239E+00	1.0239E+00	1.0147E+00	1.0164E+00	1.090E+00
RA-226	#A	1.0016E+00	1.0017E+00	1.0712E+00	1.0727E+00	1.156E+00
AC-228		6.6685E-01	6.6685E-01	1.8172E-01	1.8559E-01	
TH-227	#B	-2.1790E-01	-2.1790E-01	3.9107E-01	3.9127E-01	4.232E-01
PA-234	#B	9.8487E-02	9.8487E-02	1.5411E-01	1.5420E-01	1.687E-01
TH-234	#B	1.0209E+00	1.0209E+00	1.0496E+00	1.0511E+00	2.119E+00
AM-241	#A	-6.7209E-02	-6.7212E-02	2.6774E-01	2.6776E-01	2.817E-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 (93.2 to 1999.1 keV) 1.4550395E+01 pCi/gm
Total Decayed Activity (93.2 to 1999.1 keV) 1.4550395E+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_8AUG2006_1937.An1

Sample description
FSS-OOL-10-04-019-F

Spectrum Filename: C:\GammaVision\Spectra\101F_8AUG2006_1937.An1

Acquisition information
Start time: 08-Aug-2006 19:37:25
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: 2.0900E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 2.0900E+03) =
4.7847E+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	27-Jul-2006 08:11:00
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. 19 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.4159

***** 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	197.	15.76	1.00	1.654E-02	74.81	9.600	8.004E-01	PB212
76.91	97.	41.00	1.50	1.720E-02	77.11	17.500	PBC<MDA	PB212
					77.11	10.700	PBC<MDA	PB214
77.17	308.	10.92	1.01	1.720E-02	77.11	17.500	9.190E-01	PB212
					77.11	10.700	1.490E+00	PB214
86.92	143.	21.30	1.01	1.915E-02	86.45	32.740	1.481E-01	EU155
93.50	128.	23.56	1.02	1.996E-02	92.80	3.000	PBC<MDA	TH234
129.02	98.	37.63	0.78	2.110E-02				
185.76	121.	26.59	1.43	1.860E-02				
185.76	121.	26.59	1.43	1.860E-02	185.99	3.280	1.288E+00	RA226
209.27	76.	34.90	1.02	1.722E-02				
238.92	751.	4.36	1.12	1.556E-02	238.63	43.100	7.172E-01	PB212
241.94	138.	18.31	1.12	1.541E-02	241.00	3.900	1.471E+00	RA224
					241.92	7.470	7.704E-01	PB214
270.17	81.	28.54	1.13	1.401E-02				
295.43	211.	12.25	1.23	1.291E-02	295.22	19.200	5.453E-01	PB214
300.74	56.	33.00	1.22	1.270E-02				
328.30	58.	40.37	1.27	1.169E-02				
338.70	123.	20.00	1.16	1.134E-02	338.40	12.010	5.740E-01	AC228
352.25	340.	7.80	1.22	1.092E-02	351.99	37.100	5.388E-01	PB214
463.42	37.	37.13	1.27	8.343E-03				
463.42	37.	37.13	1.27	8.343E-03	463.51	10.000	PBC<MDA	SB125
511.20	102.	18.60	1.52	7.584E-03	510.72	22.500	3.255E-01	TL208
583.52	251.	8.46	1.46	6.680E-03	583.14	86.000	2.792E-01	TL208
609.74	261.	9.02	1.38	6.408E-03	609.32	46.090	5.679E-01	BI214
727.16	69.	21.45	1.72	5.443E-03	727.17	11.800	6.878E-01	BI212
795.35	66.	24.70	1.29	5.018E-03				

795.35	66.	24.70	1.29	5.018E-03	795.76	85.400	1.001E-01	CS134
911.80	154.	11.13	2.04	4.443E-03	911.07	29.000	7.628E-01	AC228
968.86	129.	13.30	1.19	4.212E-03	968.90	17.460	1.131E+00	AC228
1121.23	50.	20.19	1.84	3.711E-03	1120.28	15.040	5.818E-01	BI214
1461.84	589.	4.19	1.68	2.941E-03	1460.75	10.700	1.204E+01	K40
1765.99	31.	19.95	1.48	2.481E-03	1764.51	15.920	5.101E-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	
173.93	86.84	439.	113.	0.056	83.60	1.014	TB-160	D
185.77	93.42	394.	128.	0.064	71.16	1.018	U-235	D
257.66	129.02	517.	131.	0.065	78.27	0.778	AC-228	s
418.21	209.27	287.	76.	0.038	104.69	1.022	AC-228	s
540.07	270.17	189.	81.	0.041	85.63	1.133	AC-228	s
601.23	300.74	131.	56.	0.028	99.00	1.218	PB-212	s
656.38	328.30	180.	58.	0.029	121.10	1.267	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	149.19	74.81	410.	197.	0.098	47.29	1.005D
PB-212	153.79	77.11	418.	308.	0.154	32.77	1.007A
EU-155	173.77	87.10	1021.	142.	0.071	98.76	1.499s
TH-234	185.96	93.19	932.	156.	0.078	83.15	1.499s
RA-226	372.10	186.22	466.	126.	0.063	77.15	1.499s
PB-212	476.96	238.63	166.	744.	0.372	13.08	1.122D
PB-214	483.54	241.92	203.	95.	0.048	55.26	1.124A
PB-214	590.60	295.43	185.	209.	0.105	36.76	1.229
AC-228	677.18	338.70	175.	121.	0.061	60.00	1.162s
PB-214	704.30	352.25	136.	338.	0.169	23.40	1.217s
SB-125	926.36	463.23	85.	37.	0.019	111.73	1.499
TL-208	1022.33	511.20	102.	86.	0.043	55.80	1.521s
TL-208	1167.06	583.52	71.	248.	0.124	25.37	1.464
BI-214	1219.52	609.74	72.	260.	0.130	27.06	1.382
BI-212	1454.48	727.16	51.	68.	0.034	64.34	1.718s
CS-134	1591.75	795.76	34.	35.	0.018	85.35	1.502s
AC-228	1823.95	911.80	42.	152.	0.076	33.40	2.040s
AC-228	1938.14	968.86	51.	129.	0.064	39.91	1.195s
BI-214	2243.06	1121.23	23.	50.	0.025	60.57	1.839
K-40	2924.69	1461.84	8.	586.	0.293	12.57	1.676
BI-214	3533.43	1765.99	3.	31.	0.016	59.86	1.479s

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		7.7419E-02					
			477.56	7.742E-02	%(	4.093E-01 1.20E-01	G
K-40		1.2041E+01					
			1460.75	1.204E+01	(P	3.209E-01 5.07E-01	G
MN-54		-6.4434E-03					
			834.81	-6.443E-03	&(P	5.582E-02 1.60E-02	G
CO-57		-9.9974E-03					
			122.07	-9.997E-03	%(	4.753E-02 1.43E-02	G K
			136.43	9.435E-02	%	3.986E-01 1.20E-01	G
CO-60		-1.7648E-04					
			1332.51	-1.765E-04	&(P	5.759E-02 1.58E-02	G K
			1173.23	7.725E-03	% P	5.971E-02 1.70E-02	G K
Sr-85		-9.6717E-03					
			514.00	-9.672E-03	%(	5.546E-02 1.63E-02	G
Kr-85		-2.1866E+02					
			513.99	-2.187E+02	%(P	1.125E+03 3.30E+02	G
Y-88		0.0000E+00					
			1836.01	0.000E+00	&(	4.892E-02 1.24E-02	G K
			898.02	1.962E-02	% P	4.330E-02 1.31E-02	G
NB-94		-7.4800E-05					
			871.10	-7.480E-05	%(P	4.596E-02 1.28E-02	G K
			702.50	-5.180E-03	% P	5.292E-02 1.53E-02	G K
Ag-108M		3.9299E-03					
			722.95	3.930E-03	%(	4.951E-02 1.41E-02	G K
			614.37	-1.272E-02	% P	4.544E-02 1.34E-02	G
			433.93	-1.721E-03	&	4.202E-02 1.21E-02	G
CD-109		-8.7071E-02					
			88.04	-8.707E-02	&(P	1.254E+00 3.74E-01	G
SN-113		1.1751E-03					
			391.71	1.175E-03	%(	7.000E-02 2.04E-02	G K
			255.04	6.628E-01	% P	1.561E+00 4.71E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	9.2288E-02						
		427.95	2.567E-02	&(P	1.303E-01	3.84E-02	G K
		600.77	-3.434E-03	% P	1.929E-01	5.40E-02	G
		636.15	1.281E-01	& P	3.689E-01	1.10E-01	G
		463.51	2.895E-01	(P	3.568E-01	1.12E-01	G
		176.29	5.300E-03	% P	6.165E-01	1.83E-01	G
I-131	2.7767E-02						
		364.48	2.777E-02	%(	1.074E-01	3.18E-02	G K
		636.97	5.584E-01	%	1.746E+00	5.18E-01	G
		284.29	6.992E-02	&	1.508E+00	4.40E-01	G
CS-134	2.4722E-02						
		604.66	-4.798E-04	%(P	4.008E-02	1.13E-02	G K
		795.76	5.352E-02	(P	4.539E-02	1.54E-02	G
		569.29	-4.111E-02	% P	2.656E-01	7.68E-02	G
		801.84	5.595E-03	%	4.503E-01	1.25E-01	G
CS-137	1.1293E-02						
		661.62	1.129E-02	%(P	4.652E-02	1.36E-02	G
CE-139	6.6966E-03						
		165.85	6.697E-03	&(P	4.746E-02	1.41E-02	G
EU-152	-2.6596E-02						
		121.78	-2.660E-02	%(P	1.345E-01	4.03E-02	G K
		344.30	-1.648E-03	& P	1.337E-01	3.87E-02	G
		1408.08	-3.118E-02	% P	2.363E-01	6.55E-02	G
		964.00	-1.575E-01	% P	5.125E-01	1.52E-01	G
		1112.07	5.056E-02	% P	4.183E-01	1.19E-01	G
		778.90	4.784E-03	& P	3.381E-01	9.48E-02	G
EU-154	-1.5811E-02						
		123.10	-1.581E-02	%(P	9.080E-02	2.71E-02	G K
		1274.80	2.496E-03	% P	1.620E-01	4.48E-02	G
		723.30	-1.050E-02	% P	1.939E-01	5.41E-02	G
		1004.80	-7.646E-02	& P	3.329E-01	9.71E-02	G
EU-155	1.4753E-01						
		86.45	1.475E-01	(	1.576E-01	4.86E-02	G K
		105.31	3.783E-02	%	1.946E-01	5.84E-02	G
HG-203	-1.3425E-02						
		279.17	-1.342E-02	%(	5.729E-02	1.71E-02	G K
		72.87	-3.171E-01	& P	1.363E+00	4.10E-01	G
		70.83	7.755E-01	&	1.892E+00	5.72E-01	G
		82.50	-1.838E-01	%	2.921E+00	8.73E-01	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments

TL-208       2.8879E-01
                          583.14 2.792E-01  (P 4.714E-02 2.38E-02 G
                          510.72 3.255E-01 *(P 1.885E-01 7.19E-02 G

PB-212       7.3227E-01
                          238.63 7.171E-01  (P 6.047E-02 3.15E-02 G K
                                                          Energy duplication
                           77.11 6.624E-01 }   2.105E-01 7.24E-02 G
                           74.81 8.004E-01  (P 3.955E-01 1.30E-01 G

PB-214       5.3449E-01
                          351.99 5.388E-01 *(P 9.111E-02 4.23E-02 G K
                          295.22 5.453E-01  (P 1.722E-01 6.74E-02 G
                                                          Energy duplication
                           77.11 3.421E-01 } P 4.878E-01 1.40E-01 G
                          241.92 5.345E-01 } P 3.881E-01 9.85E-02 G

BI-212       6.8781E-01
                          727.17 6.878E-01 *(P 3.612E-01 1.49E-01 G K
                         1620.56-4.217E-02 %   1.810E+00 4.81E-01 G
                          785.42 7.044E-01 % P 1.993E+00 5.91E-01 G

BI-214       5.5865E-01
                          609.32 5.679E-01  (P 9.268E-02 5.15E-02 G K
                         1764.51 5.101E-01  (P 1.728E-01 1.03E-01 G
                         1120.28 5.818E-01  (P 2.891E-01 1.18E-01 G

RA-224       5.9137E-01
                                                          Derived Ave Activity
                          241.00 5.914E-01 }(P 1.239E+00 3.77E-01 G

RA-226       1.3415E+00
                          185.99 1.341E+00 @(  1.095E+00 3.45E-01 G

AC-228       7.6283E-01
                          911.07 7.628E-01  (P 1.648E-01 8.60E-02 G K
                          968.90 1.131E+00 + P 3.173E-01 1.51E-01 G
                          338.40 5.740E-01 - P 3.053E-01 1.17E-01 G

TH-227      -2.1825E-01
                          236.00-2.183E-01 %(P 4.468E-01 1.36E-01 G K
                          256.25-7.168E-02 % P 5.380E-01 1.59E-01 G

PA-234      -4.5343E-03
                           98.44-4.534E-03 %(  1.616E-01 4.80E-02 G K
                          946.00 2.315E-02 &   2.023E-01 5.68E-02 G
                          131.28-5.097E-02 &   2.128E-01 6.39E-02 G
                           94.67-1.142E-01 %   3.032E-01 9.16E-02 G
                          883.24 1.576E-02 %   3.122E-01 8.61E-02 G
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 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          926.70 6.101E-02 &   4.762E-01 1.37E-01 G
                          569.26-5.612E-02 %   3.887E-01 1.13E-01 G

TH-234       1.0954E+00
                           63.29 6.400E-01 %(P 2.075E+00 6.24E-01 G K
                           92.80 1.687E+00 *(P 1.571E+00 4.86E-01 G
                           92.38-1.781E-01 & P 1.951E+00 5.79E-01 G

AM-241       1.8795E-02
                           59.54 1.879E-02 %(P 2.675E-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	6.5844E-02	7.7419E-02	3.5908E-01	3.5911E-01	3.481E-01
K-40		1.2041E+01	1.2041E+01	1.5199E+00	1.6652E+00	
MN-54	#A	-6.2673E-03	-6.4434E-03	5.7484E-02	5.7486E-02	5.429E-02
CO-57	#B	-9.6822E-03	-9.9974E-03	4.2752E-02	4.2755E-02	4.603E-02

CO-60	#B	-1.7569E-04	-1.7648E-04	8.2054E-03	8.2054E-03	5.733E-02
Sr-85	#A	-8.4640E-03	-9.6717E-03	4.8941E-02	4.8944E-02	4.853E-02
Kr-85	#A	-2.1864E+02	-2.1866E+02	1.2264E+03	1.2264E+03	1.125E+03
Y-88	#B	0.0000E+00	0.0000E+00	3.7254E-02	3.7255E-02	4.510E-02
NB-94	#B	-7.4800E-05	-7.4800E-05	8.9792E-02	8.9792E-02	4.596E-02
Ag-108M	#B	3.9292E-03	3.9299E-03	4.2399E-02	4.2399E-02	4.950E-02
CD-109	#A	-8.5426E-02	-8.7071E-02	1.2362E+00	1.2362E+00	1.230E+00
SN-113	#B	1.0900E-03	1.1751E-03	6.1102E-02	6.1102E-02	6.493E-02
SB-125	#B	9.1503E-02	9.2288E-02	1.0714E-01	1.0727E-01	1.292E-01
I-131	#B	9.4706E-03	2.7767E-02	9.5316E-02	9.5329E-02	3.665E-02
CS-134	#B	2.4440E-02	2.4722E-02	2.1352E-02	2.1397E-02	3.962E-02
CS-137	#A	1.1284E-02	1.1293E-02	4.0653E-02	4.0659E-02	4.649E-02
CE-139	#A	6.2883E-03	6.6966E-03	4.2433E-02	4.2435E-02	4.456E-02
EU-152	#B	-2.6546E-02	-2.6596E-02	1.2851E-01	1.2852E-01	1.342E-01
EU-154	#B	-1.5767E-02	-1.5811E-02	8.8817E-02	8.8821E-02	9.054E-02
EU-155	#A	1.4682E-01	1.4753E-01	1.4570E-01	1.4593E-01	1.568E-01
HG-203	#B	-1.1151E-02	-1.3425E-02	5.1262E-02	5.1268E-02	4.759E-02
TL-208		2.8879E-01	2.8879E-01	7.3955E-02	7.5733E-02	
PB-212		7.3227E-01	7.3227E-01	9.6553E-02	1.0504E-01	
PB-214		5.3449E-01	5.3449E-01	1.2582E-01	1.2940E-01	
BI-212	#	6.8781E-01	6.8781E-01	4.4694E-01	4.4863E-01	
BI-214		5.5865E-01	5.5865E-01	1.5183E-01	1.5507E-01	
RA-224	A	5.9137E-01	5.9137E-01	1.1293E+00	1.1298E+00	
RA-226	#	1.3415E+00	1.3415E+00	1.0350E+00	1.0378E+00	1.095E+00
AC-228		7.6283E-01	7.6283E-01	2.5793E-01	2.6151E-01	
TH-227	#B	-2.1825E-01	-2.1825E-01	4.1255E-01	4.1273E-01	4.468E-01
PA-234	#B	-4.5343E-03	-4.5343E-03	1.4415E-01	1.4415E-01	1.616E-01
TH-234	#B	1.0954E+00	1.0954E+00	9.4698E-01	9.4893E-01	2.075E+00
AM-241	#A	1.8794E-02	1.8795E-02	2.3903E-01	2.3903E-01	2.674E-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) 1.6197195E+01 pCi/gm
Total Decayed Activity (270.1 to 1999.1 keV) 1.6197195E+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_12AUG2006_0932.An1

Sample description
FSS-OOL-10-04-025-F

Spectrum Filename: C:\GammaVision\Spectra\101F_12AUG2006_0932.An1

Acquisition information
Start time: 07-Aug-2006 09:32:47
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: 1.9680E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.9680E+03) =
5.0813E+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	27-Jul-2006 08:35:00
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: 0.3720

***** 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	171.	27.80	1.50	1.654E-02				
74.89	171.	27.80	1.50	1.654E-02	74.81	9.600	7.395E-01	PB212
77.16	331.	13.89	1.50	1.720E-02	77.11	10.700	1.234E+00	PB214
					77.11	17.500	7.547E-01	PB212
77.16	335.	13.89	1.50	1.720E-02	77.11	10.700	1.234E+00	PB214
					77.11	17.500	7.632E-01	PB212
86.97	117.	25.74	1.01	1.917E-02	86.45	32.740	1.290E-01	EU155
90.25	98.	31.20	1.02	1.960E-02	88.04	3.790	PBC<MDA	CD109
93.17	137.	21.70	1.02	1.993E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
99.43	177.	17.52	0.91	2.046E-02				
185.95	134.	27.11	1.45	1.859E-02				
185.95	134.	27.11	1.45	1.859E-02	185.99	3.280	1.510E+00	RA226
238.92	768.	4.20	1.12	1.556E-02	238.63	43.100	7.788E-01	PB212
242.00	124.	16.81	1.12	1.540E-02	241.00	3.900	1.404E+00	RA224
					241.92	7.470	PBC<MDA	PB214
270.69	96.	31.51	1.50	1.398E-02				
278.31	72.	32.28	1.17	1.364E-02				
278.31	72.	32.28	1.17	1.364E-02	279.17	81.500	5.220E-02	HG203
295.53	216.	11.26	1.05	1.291E-02	295.22	19.200	5.935E-01	PB214
328.89	64.	33.08	1.65	1.167E-02				
338.33	158.	17.92	1.23	1.135E-02	338.40	12.010	7.854E-01	AC228
352.26	310.	9.79	1.10	1.092E-02	351.99	37.100	5.218E-01	PB214
410.03	31.	37.29	1.08	9.408E-03				
463.86	41.	33.42	1.18	8.335E-03	463.51	10.000	PBC<MDA	SB125
511.23	125.	19.14	1.31	7.583E-03	510.72	22.500	4.389E-01	TL208
583.59	235.	8.19	1.59	6.680E-03	583.14	86.000	2.779E-01	TL208

609.78	264.	9.27	1.32	6.408E-03	609.32	46.090	6.117E-01	BI214
662.37	40.	26.88	1.00	5.931E-03	661.62	84.620	5.377E-02	CS137
727.96	62.	21.91	1.71	5.438E-03	727.17	11.800	6.513E-01	BI212
795.44	41.	39.45	1.45	5.018E-03				
795.44	41.	39.45	1.45	5.018E-03	795.76	85.400	6.539E-02	CS134
861.98	38.	28.38	0.94	4.670E-03				
911.68	165.	12.73	1.64	4.444E-03	911.07	29.000	8.687E-01	AC228
968.86	134.	13.21	1.56	4.212E-03	968.90	17.460	1.241E+00	AC228

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
1120.48	48.	22.46	1.48	3.711E-03	1120.28	15.040	5.932E-01	BI214
1461.73	736.	3.77	2.17	2.941E-03	1460.75	10.700	1.600E+01	K40
1765.62	27.	19.25	1.17	2.481E-03	1764.51	15.920	4.617E-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	
173.51	86.92	395.	117.	0.058	77.23	1.014	TB-160	lD
180.08	90.21	419.	98.	0.049	93.61	1.016	PB-214	lD
185.68	93.13	390.	124.	0.062	72.67	1.018	U-235	D
477.54	238.87	136.	768.	0.384	12.61	1.122	PB-212	D
483.70	241.95	155.	124.	0.062	50.44	1.124	PB-214	D
541.11	270.69	281.	96.	0.048	94.53	1.496	AC-228	s
657.55	328.89	149.	64.	0.032	99.25	1.648	LA-140	s
819.92	410.03	54.	31.	0.015	111.86	1.078	AC-228	
1724.25	861.98	32.	38.	0.019	85.14	0.944	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	149.36	74.89	1117.	171.	0.086	83.39	1.499s
PB-214	153.79	77.11	916.	331.	0.165	41.67	1.499D
PB-212	153.79	77.11	913.	335.	0.167	41.67	1.499D
TH-234	185.81	93.11	970.	134.	0.067	97.46	1.499s
PA-234	204.16	102.28	602.	-117.	-0.059	93.04	1.499s
RA-226	371.82	186.08	500.	104.	0.052	96.14	1.499s
PB-212	477.53	238.91	444.	616.	0.308	18.66	1.499
HG-203	555.17	277.72	188.	55.	0.028	112.66	1.499s
PB-214	590.66	295.45	211.	198.	0.099	37.27	1.499
AC-228	676.44	338.33	210.	156.	0.078	53.76	1.228
PB-214	704.29	352.25	147.	264.	0.132	26.64	1.499
SB-125	927.29	463.70	84.	42.	0.021	99.92	1.499
TL-208	1022.41	511.23	141.	109.	0.055	57.43	1.312
TL-208	1167.18	583.59	56.	233.	0.116	24.56	1.591s
BI-214	1219.60	609.78	95.	263.	0.132	27.82	1.318s
CS-137	1324.84	662.37	36.	39.	0.020	80.64	1.003s
BI-212	1456.07	727.96	47.	61.	0.030	65.74	1.711s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
CS-134	1591.38	795.58	43.	36.	0.018	91.11	1.502
AC-228	1823.71	911.68	71.	163.	0.082	38.18	1.644s
AC-228	1938.14	968.86	50.	133.	0.066	39.63	1.564s
BI-214	2241.55	1120.48	30.	48.	0.024	67.38	1.479s
K-40	2924.47	1461.73	6.	738.	0.369	11.15	2.174
BI-214	3532.68	1765.62	0.	27.	0.013	57.74	1.174s

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	%(	4.931E-01 1.42E-01	G
K-40		1.6096E+01					
			1460.75	1.610E+01	(P	3.076E-01 6.01E-01	G
MN-54		4.1469E-03					
			834.81	4.147E-03	%(P	4.476E-02 1.26E-02	G
CO-57		-7.8028E-03					
			122.07	-7.803E-03	%(	5.173E-02 1.55E-02	G K
			136.43	8.243E-02	%	3.146E-01 9.43E-02	G
CO-60		-3.9939E-03					
			1332.51	-3.994E-03	%(P	5.470E-02 1.51E-02	G K
			1173.23	-2.905E-04	% P	8.319E-02 2.36E-02	G K
Sr-85		-2.1931E-03					
			514.00	-2.193E-03	%(	5.655E-02 1.64E-02	G
Kr-85		-6.9791E+01					
			513.99	-6.979E+01	%(P	1.165E+03 3.36E+02	G
Y-88		1.1692E-02					
			1836.01	1.169E-02	%(	4.096E-02 1.16E-02	G K
			898.02	-7.371E-03	% P	5.418E-02 1.54E-02	G
NB-94		-3.5588E-04					
			871.10	-3.559E-04	%(P	3.457E-02 9.25E-03	G K
			702.50	3.443E-03	% P	3.543E-02 9.96E-03	G K

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
Ag-108M	3.0439E-03						
		722.95	3.044E-03	&(	5.841E-02	1.67E-02	G K
		614.37	-3.067E-02	& P	6.338E-02	1.92E-02	G
		433.93	8.284E-03	&	3.731E-02	1.09E-02	G
CD-109	-4.0584E-02						
		88.04	-4.058E-02	%(P	1.505E+00	4.49E-01	G
SN-113	5.1507E-03						
		391.71	5.151E-03	&(	6.679E-02	1.95E-02	G K
		255.04	6.935E-02	& P	1.970E+00	5.79E-01	G
SB-125	9.1138E-02						
		427.95	4.586E-03	%(P	1.343E-01	3.88E-02	G K
		600.77	-1.314E-03	% P	2.593E-01	7.38E-02	G
		636.15	6.513E-02	& P	3.834E-01	1.11E-01	G
		463.51	3.473E-01	(P	3.765E-01	1.20E-01	G
		176.29	-6.592E-03	& P	6.829E-01	2.02E-01	G
I-131	1.1601E-02						
		364.48	1.160E-02	%(	1.204E-01	3.52E-02	G K
		636.97	-8.675E-03	&	1.492E+00	4.20E-01	G
		284.29	2.110E-02	%	1.515E+00	4.42E-01	G
CS-134	2.6659E-02						
		604.66	-1.075E-03	%(P	4.995E-02	1.42E-02	G K
		795.76	5.835E-02	(P	5.414E-02	1.79E-02	G
		569.29	5.502E-02	% P	2.582E-01	7.53E-02	G
		801.84	1.025E-01	&	5.288E-01	1.53E-01	G
CS-137	5.3770E-02						
		661.62	5.377E-02	(P	4.178E-02	1.48E-02	G
CE-139	1.2184E-02						
		165.85	1.218E-02	&(P	4.637E-02	1.39E-02	G
EU-152	-2.0887E-02						
		121.78	-2.089E-02	%(P	1.510E-01	4.51E-02	G K
		344.30	-5.564E-03	% P	1.442E-01	4.19E-02	G
		1408.08	-1.082E-02	% P	2.061E-01	5.43E-02	G
		964.00	-5.145E-03	% P	6.645E-01	1.92E-01	G
		1112.07	-1.471E-03	% P	3.974E-01	1.09E-01	G
		778.90	1.219E-01	% P	3.187E-01	9.50E-02	G
EU-154	1.0901E-03						
		123.10	1.090E-03	%(P	1.014E-01	3.01E-02	G K
		1274.80	-2.099E-02	% P	1.854E-01	5.26E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
		723.30	8.051E-02	& P	1.999E-01	5.98E-02	G
		1004.80	1.229E-01	& P	3.005E-01	9.01E-02	G
EU-155	1.1741E-02						
		86.45	1.174E-02	%(	1.747E-01	5.22E-02	G K
		105.31	6.575E-02	%	1.991E-01	6.00E-02	G
HG-203	4.0349E-02						
		279.17	4.035E-02	*(	4.859E-02	1.52E-02	G K
		72.87	-3.829E-01	% P	1.217E+00	3.66E-01	G
		70.83	7.716E-01	%	1.903E+00	5.75E-01	G
		82.50	-9.616E-01	&	2.697E+00	8.14E-01	G
TL-208	2.7786E-01						
		583.14	2.779E-01	@(P	4.503E-02	2.30E-02	G
		510.72	4.389E-01	+ P	2.332E-01	9.64E-02	G
PB-212	6.5001E-01						
		238.63	6.301E-01	(P	1.032E-01	3.96E-02	G K
							Energy duplication
		77.11	7.632E-01	+	3.273E-01	1.06E-01	G
		74.81	7.395E-01	?(P	6.854E-01	2.12E-01	G
PB-214	4.8159E-01						
		351.99	4.468E-01	(P	1.004E-01	4.00E-02	G K
		295.22	5.489E-01	(P	1.947E-01	6.88E-02	G
							Energy duplication
		77.11	1.234E+00	+ P	5.363E-01	1.73E-01	G
		241.92	6.845E-03	% P	7.499E-01	2.23E-01	G
BI-212	6.5133E-01						
		727.17	6.513E-01	@(P	3.708E-01	1.44E-01	G K
		1620.56	2.325E-01	%	1.876E+00	5.14E-01	G
		785.42	1.086E+00	% P	2.278E+00	6.90E-01	G
BI-214	6.0715E-01						
		609.32	6.117E-01	@(P	1.117E-01	5.70E-02	G K
		1764.51	4.617E-01	- P	1.281E-01	9.04E-02	G
		1120.28	5.932E-01	*(P	3.462E-01	1.34E-01	G
RA-224	8.4543E-01						
		241.00	8.454E-01	&(P	1.287E+00	3.93E-01	G
RA-226	1.1678E+00						
		185.99	1.168E+00	*(	1.204E+00	3.74E-01	G
AC-228	8.4431E-01						
		911.07	8.687E-01	@(P	2.233E-01	1.12E-01	G K
		968.90	1.241E+00	+ P	3.333E-01	1.65E-01	G
		338.40	7.854E-01	(P	3.539E-01	1.43E-01	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments

TH-227      -2.2205E-01
                          236.00-2.220E-01 %(P 4.797E-01 1.45E-01 G K
                          256.25-3.966E-03 % P 5.643E-01 1.65E-01 G

PA-234      -1.5723E-01
                           98.44-1.572E-01 *(  1.570E-01 4.88E-02 G K
                          946.00-4.541E-03 &   2.163E-01 5.94E-02 G
                          131.28 2.760E-02 &   1.726E-01 5.15E-02 G
                           94.67-4.850E-03 %   3.327E-01 9.92E-02 G
                          883.24 9.225E-02 %   3.719E-01 1.08E-01 G
                          926.70 8.030E-03 &   3.979E-01 1.10E-01 G
                          569.26 8.486E-02 %   3.780E-01 1.11E-01 G

TH-234       1.1140E+00
                           63.29 7.866E-01 %(P 2.194E+00 6.61E-01 G K
                           92.80 1.540E+00 *(P 1.701E+00 5.23E-01 G
                           92.38 2.581E-02 % P 2.005E+00 5.96E-01 G

AM-241      -4.4627E-02
                           59.54-4.463E-02 %(P 2.909E-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

- -

***** 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	4.2548E-01	4.2548E-01	4.272E-01
K-40		1.6096E+01	1.6096E+01	1.8010E+00	2.0176E+00	
MN-54	#A	4.0465E-03	4.1469E-03	3.7756E-02	3.7757E-02	4.367E-02
CO-57	#B	-7.5847E-03	-7.8028E-03	4.6435E-02	4.6437E-02	5.029E-02
CO-60	#B	-3.9781E-03	-3.9939E-03	4.9664E-02	4.9665E-02	5.448E-02
Sr-85	#A	-1.9490E-03	-2.1931E-03	4.9144E-02	4.9144E-02	5.025E-02
Kr-85	#A	-6.9785E+01	-6.9791E+01	2.1274E+03	2.1274E+03	1.165E+03
Y-88	#B	1.0882E-02	1.1692E-02	3.4707E-02	3.4713E-02	3.812E-02
NB-94	#B	-3.5588E-04	-3.5588E-04	9.7283E-02	9.7283E-02	3.457E-02
Ag-108M	#B	3.0434E-03	3.0439E-03	5.0139E-02	5.0139E-02	5.840E-02
CD-109	#A	-3.9904E-02	-4.0584E-02	1.6812E+00	1.6812E+00	1.480E+00
SN-113	#B	4.8194E-03	5.1507E-03	5.8403E-02	5.8403E-02	6.249E-02
SB-125	#B	9.0451E-02	9.1138E-02	9.4207E-02	9.4347E-02	1.333E-01
I-131	#B	4.4785E-03	1.1601E-02	1.0551E-01	1.0551E-01	4.647E-02
CS-134	#B	2.6389E-02	2.6659E-02	2.4571E-02	2.4617E-02	4.945E-02
CS-137	#	5.3733E-02	5.3770E-02	4.4334E-02	4.4438E-02	
CE-139	#A	1.1525E-02	1.2184E-02	4.1682E-02	4.1687E-02	4.386E-02
EU-152	#B	-2.0853E-02	-2.0887E-02	1.4718E-01	1.4718E-01	1.507E-01
EU-154	#B	1.0874E-03	1.0901E-03	9.0392E-02	9.0392E-02	1.012E-01
EU-155	#B	1.1691E-02	1.1741E-02	1.5666E-01	1.5667E-01	1.739E-01
HG-203	#A	3.4237E-02	4.0349E-02	4.5456E-02	4.5513E-02	4.123E-02
TL-208		2.7786E-01	2.7786E-01	6.8929E-02	7.0694E-02	
PB-212	#	6.5001E-01	6.5001E-01	1.2250E-01	1.2789E-01	1.032E-01
PB-214	#	4.8159E-01	4.8159E-01	1.1123E-01	1.1451E-01	1.004E-01
BI-212	#	6.5133E-01	6.5133E-01	4.3298E-01	4.3454E-01	
BI-214		6.0715E-01	6.0715E-01	1.6965E-01	1.7308E-01	
RA-224	#A	8.4543E-01	8.4543E-01	1.1801E+00	1.1811E+00	1.287E+00
RA-226	#A	1.1678E+00	1.1678E+00	1.1227E+00	1.1246E+00	1.204E+00
AC-228		8.4431E-01	8.4431E-01	2.8202E-01	2.8603E-01	
TH-227	#B	-2.2205E-01	-2.2205E-01	4.4271E-01	4.4288E-01	4.797E-01
PA-234	#A	-1.5723E-01	-1.5723E-01	1.4629E-01	1.4655E-01	1.570E-01
TH-234	#B	1.1140E+00	1.1140E+00	1.1359E+00	1.1376E+00	2.194E+00
AM-241	#A	-4.4624E-02	-4.4627E-02	2.8491E-01	2.8492E-01	2.909E-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) 1.8530350E+01 pCi/gm
Total Decayed Activity (270.6 to 1999.1 keV) 1.8530388E+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_31JULY2006_1642.An1

Sample description
OOL-10-04-016-F

Spectrum Filename: C:\GammaVision\Spectra\101F_31JULY2006_1642.An1

Acquisition information

Start time:	31-Jul-2006 16:44:07
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:	2.1770E+03
Activity scaling factor:	1.0000E+06/(1.0000E+00* 2.1770E+03) = 4.5935E+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	27-Jul-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: 0.4177

***** 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	246.	13.96	1.00	1.675E-02	74.81	9.600	9.396E-01	PB212
77.22	362.	9.65	1.01	1.736E-02	77.11	10.700	1.207E+00	PB214
					77.11	17.500	7.458E-01	PB212
87.16	158.	18.61	1.01	1.927E-02	86.45	32.740	1.574E-01	EU155
89.94	110.	26.30	1.02	1.963E-02				
89.94	110.	26.30	1.02	1.963E-02	92.38	2.570	PBC<MDA	TH234
92.90	168.	17.65	1.02	1.995E-02	92.80	3.000	1.682E+00	TH234
185.82	142.	24.50	1.60	1.859E-02				
185.82	142.	24.50	1.60	1.859E-02	185.99	3.280	1.451E+00	RA226
209.25	82.	32.15	1.46	1.722E-02				
239.02	775.	4.16	1.12	1.556E-02	238.63	43.100	7.109E-01	PB212
242.04	118.	18.21	1.12	1.540E-02	241.00	3.900	1.206E+00	RA224
					241.92	7.470	PBC<MDA	PB214
270.56	76.	34.89	1.19	1.399E-02				
295.64	157.	13.15	1.10	1.290E-02	295.22	19.200	3.892E-01	PB214
328.55	45.	37.84	0.62	1.168E-02				
338.58	164.	18.95	0.84	1.134E-02	338.40	12.010	7.346E-01	AC228
352.39	311.	10.79	1.32	1.091E-02	351.99	37.100	4.730E-01	PB214
464.14	85.	26.12	1.51	8.331E-03	463.51	10.000	6.236E-01	SB125
510.67	99.	21.04	0.93	7.591E-03	510.72	22.500	3.030E-01	TL208
583.81	250.	10.03	1.25	6.677E-03	583.14	86.000	2.668E-01	TL208
609.68	211.	9.38	1.10	6.409E-03	609.32	46.090	4.414E-01	BI214
728.02	58.	28.53	1.29	5.437E-03	727.17	11.800	5.501E-01	BI212
911.99	174.	12.28	1.91	4.443E-03	911.07	29.000	8.306E-01	AC228
969.59	128.	13.04	1.45	4.210E-03	968.90	17.460	1.070E+00	AC228
1120.51	48.	24.93	2.80	3.711E-03	1120.28	15.040	5.385E-01	BI214
1461.98	627.	4.29	2.24	2.940E-03	1460.75	10.700	1.231E+01	K40

1766.17	33.	17.41	0.70	2.481E-03	1764.51	15.920	5.117E-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	
174.13	87.65	371.	142.	0.071	62.72	1.014	PB-214	D
179.71	90.44	367.	105.	0.052	83.13	1.016	PB-214	D
185.62	93.39	356.	167.	0.084	53.13	1.018	U-235	D
418.18	209.25	277.	82.	0.041	96.45	1.456	AC-228	sM
477.73	238.94	131.	775.	0.387	12.47	1.122	PB-212	D
483.77	241.96	171.	118.	0.059	54.62	1.124	PB-214	D
540.84	270.56	233.	76.	0.038	104.67	1.190	AC-228	s
656.89	328.55	114.	45.	0.022	113.52	0.616	RH-106M	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	146.04	73.24	1136.	-146.	-0.073	101.19	1.499
PB-212	149.24	74.84	1171.	191.	0.096	76.74	1.499
PB-214	153.79	77.11	1107.	306.	0.153	48.64	1.499D
PB-212	153.79	77.11	1103.	309.	0.155	48.64	1.499D
TH-234	185.85	93.13	934.	163.	0.082	79.67	1.499s
RA-226	371.77	186.06	504.	116.	0.058	86.63	1.499s
PB-212	477.68	238.99	446.	595.	0.297	19.21	1.499
RA-224	482.26	241.28	66.	40.	0.020	96.42	1.499
PB-214	590.96	295.60	193.	169.	0.084	41.33	1.499
AC-228	676.95	338.58	244.	161.	0.081	56.86	0.844
PB-214	704.65	352.43	168.	261.	0.131	27.77	1.499
SB-125	927.14	463.62	101.	53.	0.027	87.71	1.499s
TL-208	1021.24	510.65	124.	84.	0.042	64.17	0.935s
TL-208	1167.63	583.81	110.	247.	0.124	30.08	1.249s
BI-214	1219.40	609.68	64.	210.	0.105	28.15	1.103s
BI-212	1456.46	728.15	55.	41.	0.021	87.71	1.499
AC-228	1824.34	911.99	66.	173.	0.086	36.84	1.907s
AC-228	1939.60	969.59	43.	127.	0.063	39.11	1.450
BI-214	2241.61	1120.51	35.	48.	0.024	74.78	2.800s
K-40	2924.97	1461.98	27.	625.	0.312	12.87	2.237s
BI-214	3533.79	1766.17	0.	33.	0.016	52.22	0.698s

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		-8.4233E-02					
			477.56	-8.423E-02	%(	3.580E-01 1.05E-01	G
K-40		1.2313E+01					
			1460.75	1.231E+01	@(P	5.351E-01 5.30E-01	G
MN-54		-5.4506E-04					
			834.81	-5.451E-04	&(P	5.382E-02 1.52E-02	G
CO-57		1.0029E-02					
			122.07	1.003E-02	&(	4.481E-02 1.34E-02	G K
			136.43	1.207E-04	%	3.740E-01 1.11E-01	G
CO-60		-1.6893E-04					
			1332.51	-1.689E-04	%(P	5.255E-02 1.43E-02	G K
			1173.23	2.772E-02	% P	6.269E-02 1.89E-02	G K
Sr-85		-1.2128E-02					
			514.00	-1.213E-02	%(	4.975E-02 1.47E-02	G
Kr-85		-2.8976E+02					
			513.99	-2.898E+02	%(P	1.101E+03 3.25E+02	G
Y-88		4.3469E-03					
			1836.01	4.347E-03	&(	4.265E-02 1.13E-02	G K
			898.02	-4.403E-03	% P	4.622E-02 1.30E-02	G
NB-94		1.1125E-02					
			871.10	1.112E-02	%(P	3.494E-02 1.02E-02	G K
			702.50	1.769E-02	% P	3.874E-02 1.17E-02	G K
Ag-108M		5.9672E-05					
			722.95	5.967E-05	&(	4.573E-02 1.29E-02	G K
			614.37	-1.345E-02	% P	4.599E-02 1.36E-02	G
			433.93	-1.793E-04	%	3.970E-02 1.14E-02	G
CD-109		-3.3828E-01					
			88.04	-3.383E-01	%(P	1.158E+00 3.49E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SN-113	4.5192E-03						
		391.71	4.519E-03	%(	6.021E-02	1.76E-02	G K
		255.04	-5.961E-01	% P	1.876E+00	5.63E-01	G
SB-125	1.0184E-01						
		427.95	2.590E-03	%(P	9.294E-02	2.64E-02	G K
		600.77	-6.725E-03	& P	2.227E-01	6.34E-02	G
		636.15	-5.411E-03	& P	3.301E-01	9.26E-02	G
		463.51	3.956E-01	*(P	3.697E-01	1.19E-01	G
		176.29	-8.890E-02	& P	5.418E-01	1.61E-01	G
I-131	7.1679E-04						
		364.48	7.168E-04	&(	5.919E-02	1.71E-02	G K
		636.97	5.484E-03	%	7.097E-01	1.99E-01	G
		284.29	-3.024E-01	%	8.315E-01	2.50E-01	G
CS-134	-1.4575E-02						
		604.66	-1.457E-02	%(P	5.055E-02	1.50E-02	G K
		795.76	2.383E-02	% P	4.512E-02	1.38E-02	G
		569.29	3.173E-02	% P	2.463E-01	7.11E-02	G
		801.84	0.000E+00	%	5.825E-01	1.65E-01	G
CS-137	-1.2460E-03						
		661.62	-1.246E-03	%(P	4.106E-02	1.13E-02	G
CE-139	-2.6607E-03						
		165.85	-2.661E-03	&(P	4.621E-02	1.37E-02	G
EU-152	2.8844E-02						
		121.78	2.884E-02	&(P	1.332E-01	4.00E-02	G K
		344.30	-3.012E-02	% P	1.334E-01	3.95E-02	G
		1408.08	3.702E-02	% P	2.344E-01	6.59E-02	G
		964.00	-5.439E-03	% P	3.060E-01	8.41E-02	G
		1112.07	1.201E-01	% P	4.269E-01	1.25E-01	G
		778.90	-5.564E-02	% P	3.183E-01	9.16E-02	G
EU-154	2.1449E-02						
		123.10	2.145E-02	%(P	9.109E-02	2.73E-02	G K
		1274.80	3.038E-02	% P	1.362E-01	3.91E-02	G
		723.30	-1.335E-02	& P	2.374E-01	6.76E-02	G
		1004.80	-6.940E-02	% P	2.946E-01	8.58E-02	G
EU-155	1.7997E-02						
		86.45	1.800E-02	&(	1.650E-01	4.94E-02	G K
		105.31	6.562E-02	%	1.928E-01	5.82E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
HG-203	1.7038E-02						
		279.17	1.704E-02	%(	4.210E-02	1.27E-02	G K
		72.87	-6.746E-01	% P	1.170E+00	3.55E-01	G
		70.83	-1.814E+00	&	1.988E+00	6.12E-01	G
		82.50	-6.183E-01	&	2.480E+00	7.46E-01	G
TL-208	2.7473E-01						
		583.14	2.668E-01	@(P	5.567E-02	2.70E-02	G
		510.72	3.048E-01	*(P	1.986E-01	7.77E-02	G
PB-212	5.7540E-01						
		238.63	5.500E-01	(P	9.349E-02	3.56E-02	G K
							Energy duplication
		77.11	6.379E-01	(	3.247E-01	1.03E-01	G
		74.81	7.479E-01	+ P	6.340E-01	1.97E-01	G
PB-214	4.0803E-01						
		351.99	4.005E-01	(P	9.654E-02	3.73E-02	G K
		295.22	4.227E-01	(P	1.688E-01	5.88E-02	G
							Energy duplication
		77.11	1.031E+00	+ P	5.320E-01	1.69E-01	G
		241.92	2.761E-02	% P	6.808E-01	2.02E-01	G
BI-212	3.9911E-01						
		727.17	3.991E-01	(P	3.601E-01	1.19E-01	G K
		1620.56	1.252E-01	%	1.312E+00	3.45E-01	G
		785.42	1.397E+00	% P	1.911E+00	6.04E-01	G
BI-214	4.7490E-01						
		609.32	4.414E-01	*(P	8.387E-02	4.17E-02	G K
		1764.51	5.117E-01	(P	1.158E-01	9.03E-02	G
		1120.28	5.385E-01	(P	3.349E-01	1.35E-01	G
RA-224	4.1271E-01						
		241.00	4.127E-01	(P	4.185E-01	1.35E-01	G
RA-226	1.1830E+00						
		185.99	1.183E+00	(	1.094E+00	3.42E-01	G
AC-228	8.8237E-01						
		911.07	8.306E-01	(P	1.959E-01	1.03E-01	G K
		968.90	1.070E+00	(P	2.814E-01	1.40E-01	G
		338.40	7.346E-01	(P	3.436E-01	1.41E-01	G
TH-227	-5.6462E-02						
		236.00	-5.646E-02	%(P	3.675E-01	1.09E-01	G K
		256.25	-1.929E-01	% P	5.145E-01	1.55E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
PA-234	9.9379E-02						
		98.44	9.938E-02	&(	1.634E-01	4.98E-02	G K
		946.00	2.126E-02	%	2.260E-01	6.39E-02	G
		131.28	-1.639E-03	&	1.969E-01	5.86E-02	G
		94.67	-1.746E-01	%	2.976E-01	9.06E-02	G
		883.24	6.234E-02	%	2.981E-01	8.54E-02	G
		926.70	-6.091E-02	%	3.538E-01	1.01E-01	G
		569.26	5.066E-02	%	3.628E-01	1.05E-01	G
TH-234	9.7538E-01						
		63.29	4.194E-01	%(P	2.017E+00	6.04E-01	G K
		92.80	1.698E+00	@(P	1.509E+00	4.68E-01	G
		92.38	1.064E-01	% P	1.676E+00	4.98E-01	G
AM-241	-4.4450E-03						
		59.54	-4.445E-03	%(P	2.324E-01	6.89E-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	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	-7.9590E-02	-8.4233E-02	3.1611E-01	3.1615E-01	3.383E-01
K-40	#	1.2313E+01	1.2313E+01	1.5899E+00	1.7355E+00	
MN-54	#A	-5.3980E-04	-5.4506E-04	3.8139E-02	3.8139E-02	5.330E-02
CO-57	#B	9.9170E-03	1.0029E-02	4.0328E-02	4.0331E-02	4.431E-02
CO-60	#B	-1.6867E-04	-1.6893E-04	7.4466E-03	7.4467E-03	5.246E-02
Sr-85	#A	-1.1574E-02	-1.2128E-02	4.4236E-02	4.4241E-02	4.748E-02
Kr-85	#A	-2.8975E+02	-2.8976E+02	1.1389E+03	1.1390E+03	1.101E+03
Y-88	#B	4.2252E-03	4.3469E-03	3.3792E-02	3.3793E-02	4.146E-02
NB-94	#B	1.1125E-02	1.1125E-02	3.0728E-02	3.0734E-02	3.494E-02
Ag-108M	#B	5.9668E-05	5.9672E-05	3.8552E-02	3.8552E-02	4.573E-02
CD-109	#A	-3.3603E-01	-3.3828E-01	1.0706E+00	1.0708E+00	1.151E+00
SN-113	#B	4.4019E-03	4.5192E-03	5.2720E-02	5.2720E-02	5.865E-02
SB-125	#F	1.0154E-01	1.0184E-01	9.1764E-02	9.1945E-02	9.266E-02
I-131	#B	4.9189E-04	7.1679E-04	5.1353E-02	5.1353E-02	4.062E-02
CS-134	#B	-1.4516E-02	-1.4575E-02	4.8798E-02	4.8805E-02	5.035E-02
CS-137	#A	-1.2457E-03	-1.2460E-03	5.1813E-01	5.1813E-01	4.105E-02
CE-139	#A	-2.6028E-03	-2.6607E-03	4.5466E-02	4.5466E-02	4.520E-02
EU-152	#B	2.8825E-02	2.8844E-02	1.1986E-01	1.1987E-01	1.331E-01
EU-154	#B	2.1428E-02	2.1449E-02	8.1969E-02	8.1978E-02	9.100E-02
EU-155	#B	1.7967E-02	1.7997E-02	1.4831E-01	1.4831E-01	1.647E-01
HG-203	#B	1.5966E-02	1.7038E-02	3.8080E-02	3.8092E-02	3.945E-02
TL-208	#	2.7473E-01	2.7473E-01	8.3427E-02	8.4859E-02	
PB-212	#	5.7540E-01	5.7540E-01	1.1166E-01	1.1630E-01	9.349E-02
PB-214	#	4.0803E-01	4.0803E-01	1.0256E-01	1.0512E-01	9.654E-02
BI-212	#	3.9911E-01	3.9911E-01	3.5579E-01	3.5650E-01	3.601E-01
BI-214		4.7490E-01	4.7490E-01	1.3439E-01	1.3705E-01	
RA-224	A	4.1271E-01	4.1271E-01	4.0504E-01	4.0571E-01	4.185E-01
RA-226	#	1.1830E+00	1.1830E+00	1.0248E+00	1.0270E+00	1.094E+00
AC-228		8.8237E-01	8.8237E-01	2.3262E-01	2.3791E-01	
TH-227	#B	-5.6462E-02	-5.6462E-02	3.4679E-01	3.4681E-01	3.675E-01
PA-234	#B	9.9379E-02	9.9379E-02	1.4944E-01	1.4954E-01	1.634E-01
TH-234	#B	9.7538E-01	9.7538E-01	8.0646E-01	8.0827E-01	2.017E+00
AM-241	#A	-4.4449E-03	-4.4450E-03	4.8174E-01	4.8174E-01	2.324E-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) 1.4357656E+01 pCi/gm
Total Decayed Activity (270.1 to 1999.1 keV) 1.4357656E+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_1AUG.An1

Sample description
FSS-OOL-10-04-022-F

Spectrum Filename: C:\GammaVision\Spectra\102F_1AUG.An1

Acquisition information
Start time: 01-Aug-2006 11:40:27
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: 1.9560E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.9560E+03) =
5.1125E+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_1AUG.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	27-Jul-2006 08:12:00
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: 0.5278

***** 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	107.	27.77	1.10	8.870E-03	74.81	9.600	PBC<MDA	PB212
77.46	213.	15.33	1.10	9.749E-03	77.11	10.700	1.438E+00	PB214
					77.11	17.500	8.794E-01	PB212
87.08	134.	33.88	1.43	1.213E-02	86.45	32.740	PBC<MDA	EU155
					88.04	3.790	PBC<MDA	CD109
93.24	77.	39.70	0.65	1.342E-02	92.80	3.000	1.323E+00	TH234
129.60	135.	28.08	0.95	1.717E-02				
129.60	135.	28.08	0.95	1.717E-02	131.28	20.000	2.704E-01	PA234
209.69	102.	26.88	0.70	1.517E-02				
239.22	777.	5.97	1.10	1.378E-02	238.63	43.100	9.027E-01	PB212
270.57	61.	31.10	0.93	1.241E-02				
295.50	150.	16.68	1.22	1.146E-02	295.22	19.200	4.714E-01	PB214
300.90	53.	33.53	1.46	1.126E-02				
338.85	152.	22.31	1.35	1.005E-02	338.40	12.010	8.680E-01	AC228
352.62	250.	11.85	1.19	9.662E-03	351.99	37.100	4.806E-01	PB214
463.96	52.	25.13	2.05	7.358E-03	463.51	10.000	4.750E-01	SB125
511.34	130.	16.43	1.54	6.687E-03	510.72	22.500	5.962E-01	TL208
584.33	240.	8.70	1.36	5.879E-03	583.14	86.000	3.273E-01	TL208
610.50	205.	10.44	1.47	5.639E-03	609.32	46.090	5.434E-01	BI214
662.76	100.	20.88	2.18	5.221E-03	661.62	84.620	1.562E-01	CS137
728.27	54.	32.54	1.87	4.794E-03	727.17	11.800	6.570E-01	BI212
912.85	141.	12.30	1.64	3.915E-03	911.07	29.000	8.551E-01	AC228
969.27	112.	15.64	2.02	3.717E-03				
1122.05	42.	26.09	1.82	3.283E-03	1120.28	15.040	5.850E-01	BI214
1463.31	628.	4.09	2.18	2.617E-03	1460.75	10.700	1.546E+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	
148.62	74.88	391.	107.	0.054	83.31	1.098	BI-207	D
154.49	77.82	424.	213.	0.106	45.99	1.100	PB-214	D
173.74	87.08	771.	134.	0.067	101.65	1.426	BI-207	l
186.07	93.24	446.	77.	0.038	119.10	0.651	U-235	l
258.80	129.60	501.	133.	0.067	75.70	0.947	AC-228	sM
419.00	209.69	280.	102.	0.051	80.64	0.699	NP-239	sM
478.07	239.22	1025.	158.	0.079	89.51	1.100	PB-212	M
540.78	270.57	130.	61.	0.031	93.31	0.925	AC-228	sM
601.46	300.90	116.	53.	0.027	100.59	1.463	PB-212	sM
1938.74	969.27	66.	101.	0.050	45.51	2.020	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	904.	228.	0.114	59.50	1.500D
PB-212	153.80	77.11	904.	228.	0.114	59.50	1.500D
PB-212	477.87	239.12	429.	573.	0.286	19.81	1.500
PB-214	591.38	295.86	188.	127.	0.063	52.99	1.500s
AC-228	677.33	338.83	93.	147.	0.074	37.18	1.500
PB-214	705.02	352.67	140.	217.	0.109	30.71	1.500s
SB-125	927.42	463.84	84.	47.	0.023	91.12	1.500s
TL-208	1022.46	511.34	96.	130.	0.065	49.30	1.542s
TL-208	1168.50	584.33	62.	240.	0.120	26.10	1.362s
BI-214	1220.85	610.50	70.	205.	0.102	31.33	1.474s
CS-137	1325.42	662.76	80.	100.	0.050	62.64	2.182s
BI-212	1456.50	728.27	70.	54.	0.027	97.63	1.873s
AC-228	1825.86	912.86	30.	117.	0.059	34.01	1.679
BI-214	2244.49	1122.05	39.	42.	0.021	78.27	1.819s
K-40	2927.60	1463.35	10.	612.	0.306	12.30	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		-9.8503E-02					
			477.56	-9.850E-02	%(	4.055E-01 1.19E-01	G
K-40		1.5090E+01					
			1460.75	1.509E+01	(P	4.209E-01 6.19E-01	G
MN-54		-7.0600E-03					
			834.81	-7.060E-03	%(P	5.658E-02 1.61E-02	G
CO-57		1.7561E-02					
			122.07	1.756E-02	%(	5.746E-02 1.73E-02	G K
			136.43	-4.730E-03	&	4.584E-01 1.36E-01	G
CO-60		-9.5309E-03					
			1332.51	-9.531E-03	&(P	6.489E-02 1.83E-02	G K
			1173.23	3.139E-02	%	6.701E-02 2.03E-02	G K
Sr-85		-5.9988E-04					
			514.00	-5.999E-04	%(	5.714E-02 1.65E-02	G
Kr-85		-5.4378E+00					
			513.99	-5.438E+00	%(	1.248E+03 3.59E+02	G
Y-88		-2.1964E-05					
			1836.01	-2.196E-05	%(P	7.588E-02 2.03E-02	G K
			898.02	6.267E-03	& P	5.102E-02 1.43E-02	G
NB-94		1.4757E-02					
			871.10	1.476E-02	&(	5.179E-02 1.52E-02	G K
			702.50	-7.163E-05	%	5.275E-02 1.49E-02	G K
Ag-108M		-1.5556E-02					
			722.95	-1.556E-02	%(	6.069E-02 1.78E-02	G K
			614.37	-5.929E-02	% P	8.490E-02 2.62E-02	G
			433.93	2.276E-03	&	4.853E-02 1.40E-02	G
CD-109		1.3942E+00					
			88.04	1.394E+00	%(P	2.073E+00 6.33E-01	G
SN-113		1.3510E-02					
			391.71	1.351E-02	%(	6.258E-02 1.84E-02	G K
			255.04	1.896E-01	%	1.911E+00 5.63E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	9.6570E-02						
		427.95	-1.874E-02	%(P	1.488E-01	4.31E-02	G K
		600.77	8.011E-02	% P	2.038E-01	6.09E-02	G
		636.15	8.028E-02	% P	4.064E-01	1.18E-01	G
		463.51	4.379E-01	(P	4.277E-01	1.37E-01	G
		176.29	1.337E-01	% P	6.432E-01	1.92E-01	G
I-131	0.0000E+00						
		364.48	0.000E+00	%(	7.791E-02	2.25E-02	G K
		636.97	1.475E-01	%	1.007E+00	2.90E-01	G
		284.29	-2.755E-01	%	1.128E+00	3.36E-01	G
CS-134	-1.1181E-02						
		604.66	-1.118E-02	%(	5.167E-02	1.51E-02	G K
		795.76	4.141E-02	%	5.494E-02	1.75E-02	G
		569.29	0.000E+00	%	3.372E-01	9.62E-02	G
		801.84	-8.183E-02	% P	5.260E-01	1.50E-01	G
CS-137	1.5617E-01						
		661.62	1.562E-01	*(	6.933E-02	3.27E-02	G
CE-139	1.5470E-02						
		165.85	1.547E-02	%(P	5.044E-02	1.51E-02	G
EU-152	5.0166E-02						
		121.78	5.017E-02	%(P	1.671E-01	5.02E-02	G K
		344.30	3.531E-02	&	1.268E-01	3.76E-02	G
		1408.08	-4.255E-02	%	2.682E-01	7.50E-02	G
		964.00	2.432E-02	% P	4.986E-01	1.42E-01	G
		1112.07	-2.264E-02	%	5.199E-01	1.46E-01	G
		778.90	1.549E-02	% P	3.234E-01	8.94E-02	G
EU-154	-3.8568E-03						
		123.10	-3.857E-03	%(P	1.226E-01	3.64E-02	G K
		1274.80	6.065E-02	%	2.078E-01	6.10E-02	G
		723.30	7.436E-04	% P	2.662E-01	7.47E-02	G
		1004.80	0.000E+00	%	3.024E-01	8.28E-02	G
EU-155	-1.7996E-02						
		86.45	-1.800E-02	%(P	2.719E-01	8.11E-02	G K
		105.31	1.041E-02	%	1.953E-01	5.77E-02	G
HG-203	1.9181E-02						
		279.17	1.918E-02	&(P	4.956E-02	1.49E-02	G K
		72.87	-1.025E+00	&	2.338E+00	7.08E-01	G
		70.83	-1.675E-01	%	4.160E+00	1.24E+00	G
		82.50	1.929E-01	&	4.701E+00	1.40E+00	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	3.2733E-01						
		583.14	3.273E-01	(P	5.374E-02	2.86E-02	G
		510.72	5.962E-01	+	2.218E-01	9.81E-02	G
PB-212	6.6516E-01						
		238.63	6.652E-01	(	1.152E-01	4.39E-02	G K
							Energy duplication
		77.11	9.414E-01	+	5.910E-01	1.87E-01	G
		74.81	8.215E-01	& P	1.259E+00	3.84E-01	G
PB-214	4.1156E-01						
		351.99	4.183E-01	@(P	1.113E-01	4.29E-02	G K
		295.22	3.985E-01	@(	2.090E-01	7.04E-02	G
							Energy duplication
		77.11	1.540E+00	+	9.667E-01	3.05E-01	G
		241.92	2.962E-01	%	7.260E-01	2.19E-01	G
BI-212	6.5705E-01						
		727.17	6.570E-01	(	5.099E-01	2.14E-01	G K
		1620.56	-3.778E-01	% P	1.899E+00	5.18E-01	G
		785.42	3.763E-01	% P	2.550E+00	7.30E-01	G
BI-214	5.5364E-01						
		609.32	5.434E-01	@(	1.108E-01	5.68E-02	G K
		1764.51	-4.267E-03	% P	3.763E-01	9.81E-02	G
		1120.28	5.850E-01	&(	4.429E-01	1.53E-01	G
RA-224	5.9373E-01						
		241.00	5.937E-01	%(P	1.388E+00	4.20E-01	G
RA-226	7.7911E-01						
		185.99	7.791E-01	%(P	1.357E+00	4.13E-01	G
AC-228	7.5085E-01						
		911.07	7.130E-01	(P	1.723E-01	8.10E-02	G K
		968.90	1.242E-01	% P	4.041E-01	1.20E-01	G
		338.40	8.422E-01	(	2.724E-01	1.04E-01	G
TH-227	3.4513E-03						
		236.00	3.451E-03	%(P	5.870E-01	1.75E-01	G K
		256.25	5.904E-02	&	5.765E-01	1.70E-01	G
PA-234	-3.6744E-02						
		98.44	-3.674E-02	%(	2.592E-01	7.75E-02	G K
		946.00	9.973E-02	&	2.527E-01	7.55E-02	G
		131.28	2.630E-03	&	2.326E-01	6.90E-02	G
		94.67	-8.227E-02	&	4.723E-01	1.42E-01	G
		883.24	5.881E-02	&	4.266E-01	1.21E-01	G
		926.70	7.298E-02	&	4.700E-01	1.34E-01	G

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 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26 0.000E+00 %   4.978E-01 1.42E-01 G

TH-234       1.6046E+00
                           63.29 1.605E+00 %(P 4.695E+00 1.42E+00 G K
                           92.80 1.378E+00 %   2.467E+00 7.50E-01 G
                           92.38-3.013E-01 % P 2.889E+00 8.63E-01 G

AM-241      -6.1469E-02
                           59.54-6.147E-02 &(  6.929E-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

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
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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	-9.2140E-02	-9.8503E-02	3.5712E-01	3.5716E-01	3.793E-01
K-40		1.5090E+01	1.5090E+01	1.8572E+00	2.0411E+00	4.209E-01
MN-54	#A	-6.9798E-03	-7.0600E-03	5.3446E-02	5.3447E-02	5.593E-02
CO-57	#B	1.7331E-02	1.7561E-02	5.1856E-02	5.1865E-02	5.670E-02
CO-60	#B	-9.5133E-03	-9.5309E-03	5.7109E-02	5.7112E-02	6.477E-02

Sr-85	#A	-5.6778E-04	-5.9988E-04	4.9357E-02	4.9357E-02	5.408E-02
Kr-85	#A	-5.4376E+00	-5.4378E+00	1.0768E+03	1.0768E+03	1.248E+03
Y-88	#B	-2.1242E-05	-2.1964E-05	7.9825E-04	7.9825E-04	7.338E-02
NB-94	#B	1.4757E-02	1.4757E-02	4.5518E-02	4.5526E-02	5.179E-02
Ag-108M	#B	-1.5554E-02	-1.5556E-02	5.3465E-02	5.3472E-02	6.069E-02
CD-109	#A	1.3833E+00	1.3942E+00	1.8998E+00	1.9014E+00	2.057E+00
SN-113	#B	1.3098E-02	1.3510E-02	5.5250E-02	5.5256E-02	6.067E-02
SB-125	#B	9.6230E-02	9.6570E-02	9.0921E-02	9.1082E-02	1.483E-01
I-131	#B	0.0000E+00	0.0000E+00	6.7434E-02	6.7434E-02	5.000E-02
CS-134	#B	-1.1128E-02	-1.1181E-02	4.5369E-02	4.5374E-02	5.143E-02
CS-137	#	1.5612E-01	1.5617E-01	9.7830E-02	9.8222E-02	
CE-139	#A	1.5074E-02	1.5470E-02	4.5431E-02	4.5440E-02	4.915E-02
EU-152	#B	5.0127E-02	5.0166E-02	1.5069E-01	1.5072E-01	1.669E-01
EU-154	#B	-3.8524E-03	-3.8568E-03	1.2176E-01	1.2176E-01	1.225E-01
EU-155	#B	-1.7961E-02	-1.7996E-02	5.3377E-01	5.3377E-01	2.714E-01
HG-203	#B	1.7768E-02	1.9181E-02	4.4731E-02	4.4744E-02	4.591E-02
TL-208	#	3.2733E-01	3.2733E-01	8.5587E-02	8.7536E-02	
PB-212	#	6.6516E-01	6.6516E-01	1.3176E-01	1.3694E-01	1.152E-01
PB-214	#	4.1156E-01	4.1156E-01	1.2610E-01	1.2820E-01	1.113E-01
BI-212		6.5705E-01	6.5705E-01	6.4145E-01	6.4251E-01	
BI-214	#	5.5364E-01	5.5364E-01	1.7347E-01	1.7623E-01	
RA-224	#A	5.9373E-01	5.9373E-01	1.2590E+00	1.2595E+00	1.388E+00
RA-226	#A	7.7911E-01	7.7911E-01	1.2379E+00	1.2386E+00	1.357E+00
AC-228		7.5085E-01	7.5085E-01	1.8935E-01	1.9398E-01	1.723E-01
TH-227	#B	3.4513E-03	3.4513E-03	5.2354E-01	5.2354E-01	5.870E-01
PA-234	#B	-3.6744E-02	-3.6744E-02	2.3264E-01	2.3265E-01	2.592E-01
TH-234	#B	1.6046E+00	1.6046E+00	4.2467E+00	4.2476E+00	4.695E+00
AM-241	#A	-6.1468E-02	-6.1469E-02	6.1972E-01	6.1973E-01	6.929E-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 (86.7 to 1999.0 keV) 1.7534855E+01 pCi/gm
Total Decayed Activity (86.7 to 1999.0 keV) 1.7534904E+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_7AUG2006_1603.An1

Sample description
FSS-OOL-10-04-008-F

Spectrum Filename: C:\GammaVision\Spectra\102F_7AUG2006_1603.An1

Acquisition information
Start time: 07-Aug-2006 16:03:52
Live time: 2000
Real time: 2023
Dead time: 1.12 %
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	27-Jul-2006 08:46:00
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: 0.6017

***** 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	122.	37.28	1.50	8.847E-03				
74.92	122.	37.28	1.50	8.847E-03	74.81	9.600	PBC<MDA	PB212
77.09	180.	25.22	1.50	9.541E-03	77.11	10.700	1.212E+00	PB214
					77.11	17.500	7.413E-01	PB212
77.09	180.	25.22	1.50	9.541E-03	77.11	10.700	1.212E+00	PB214
					77.11	17.500	7.413E-01	PB212
185.79	119.	31.20	1.47	1.627E-02				
185.79	119.	31.20	1.47	1.627E-02	185.99	3.280	1.470E+00	RA226
210.03	116.	26.44	1.05	1.516E-02				
239.01	655.	4.73	1.22	1.379E-02	238.63	43.100	7.557E-01	PB212
242.07	108.	19.97	1.22	1.365E-02	241.92	7.470	7.243E-01	PB214
295.72	152.	12.25	1.26	1.145E-02	295.22	19.200	4.736E-01	PB214
299.93	37.	40.55	0.87	1.130E-02				
338.79	147.	21.12	1.60	1.005E-02	338.40	12.010	8.335E-01	AC228
352.48	261.	13.08	1.45	9.665E-03	351.99	37.100	4.979E-01	PB214
463.22	62.	34.33	1.07	7.369E-03				
463.22	62.	34.33	1.07	7.369E-03	463.51	10.000	5.646E-01	SB125
511.67	116.	15.97	1.32	6.683E-03	510.72	22.500	5.264E-01	TL208
					513.99	0.004	2.772E+03	Kr85
					514.00	99.270	1.355E-01	Sr85
583.92	219.	11.76	1.27	5.882E-03	583.14	86.000	2.960E-01	TL208
610.45	195.	9.88	1.30	5.639E-03	609.32	46.090	5.137E-01	BI214
727.73	33.	37.97	1.09	4.791E-03	727.17	11.800	3.953E-01	BI212
769.63	38.	33.41	1.03	4.554E-03				
912.47	132.	10.29	1.47	3.917E-03	911.07	29.000	7.947E-01	AC228
969.75	81.	16.53	1.98	3.718E-03	968.90	17.460	8.566E-01	AC228
1121.39	51.	25.19	1.99	3.283E-03	1120.28	15.040	7.085E-01	BI214

1462.75	613.	4.20	2.18	2.618E-03	1460.75	10.700	1.500E+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
419.67	210.03	330.	116.	0.058	79.33	1.055	NP-239 sM
477.64	238.97	153.	655.	0.328	14.19	1.215	PB-212 D
483.77	242.03	177.	108.	0.054	59.90	1.217	PB-214 D
599.51	299.93	99.	37.	0.019	121.65	0.867	TH-227 s
1539.26	769.63	46.	38.	0.019	100.23	1.028	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	149.41	74.92	1033.	122.	0.061	111.85	1.500s
PB-214	153.80	77.11	946.	180.	0.090	75.67	1.500D
PB-212	153.80	77.11	946.	180.	0.090	75.67	1.500D
RA-226	371.91	186.15	429.	93.	0.047	94.38	1.500s
PB-212	477.68	239.02	412.	567.	0.283	19.74	1.500
PB-214	590.95	295.65	190.	169.	0.084	41.65	1.500
AC-228	677.25	338.79	226.	147.	0.073	63.36	1.597s
PB-214	704.66	352.49	163.	218.	0.109	32.11	1.500
SB-125	926.84	463.55	88.	38.	0.019	109.63	1.500
TL-208	1023.12	511.67	70.	116.	0.058	47.91	1.316s
TL-208	1167.67	583.92	111.	219.	0.109	35.27	1.272
BI-214	1220.74	610.45	55.	195.	0.097	29.63	1.301s
BI-212	1455.41	727.73	46.	33.	0.016	113.92	1.091
AC-228	1825.09	912.47	21.	132.	0.066	30.87	1.465
AC-228	1939.71	969.75	30.	81.	0.041	49.60	1.983s
BI-214	2243.17	1121.39	38.	51.	0.025	75.56	1.991s
K-40	2926.43	1462.76	17.	576.	0.288	12.85	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		1.1144E-02					
			477.56	1.114E-02	&(	4.762E-01 1.36E-01	G
K-40		1.4079E+01					
			1460.75	1.408E+01	(P	5.295E-01 6.03E-01	G
MN-54		-4.5563E-04					
			834.81	-4.556E-04	%(P	5.297E-02 1.47E-02	G
CO-57		2.5214E-02					
			122.07	2.521E-02	%(	5.421E-02 1.64E-02	G K
			136.43	1.165E-01	%	4.468E-01 1.34E-01	G
CO-60		1.5589E-02					
			1332.51	1.559E-02	%(P	5.506E-02 1.59E-02	G K
			1173.23	0.000E+00	%	9.658E-02 2.75E-02	G K
Sr-85		9.6443E-04					
			514.00	9.644E-04	&(	5.521E-02 1.58E-02	G
Kr-85		8.9524E+01					
			513.99	8.952E+01	&(	1.072E+03 3.09E+02	G
Y-88		9.5172E-03					
			1836.01	9.517E-03	&(P	6.427E-02 1.76E-02	G K
			898.02	1.700E-03	% P	6.081E-02 1.69E-02	G
NB-94		0.0000E+00					
			871.10	0.000E+00	%(	6.757E-02 1.91E-02	G K
			702.50	1.867E-03	%	4.266E-02 1.19E-02	G K
Ag-108M		-7.9147E-03					
			722.95	-7.915E-03	%(	5.920E-02 1.70E-02	G K
			614.37	-2.247E-02	% P	7.090E-02 2.11E-02	G
			433.93	9.482E-03	%	4.379E-02 1.29E-02	G
CD-109		3.4116E-01					
			88.04	3.412E-01	%(P	2.211E+00 6.62E-01	G
SN-113		2.5662E-02					
			391.71	2.566E-02	%(	7.159E-02 2.14E-02	G K
			255.04	8.595E-01	%	1.762E+00 5.35E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	9.1092E-02						
		427.95	2.954E-04	&(P	1.324E-01	3.77E-02	G K
		600.77	-6.718E-02	% P	2.911E-01	8.55E-02	G
		636.15	1.341E-01	% P	3.739E-01	1.11E-01	G
		463.51	3.598E-01	(P	4.354E-01	1.37E-01	G
		176.29	5.956E-02	& P	6.579E-01	1.95E-01	G
I-131	4.4724E-02						
		364.48	4.472E-02	%(	1.233E-01	3.69E-02	G K
		636.97	-4.996E-01	&	1.964E+00	5.78E-01	G
		284.29	-3.019E-01	%	1.740E+00	5.15E-01	G
CS-134	2.0231E-02						
		604.66	2.023E-02	%(	3.986E-02	1.22E-02	G K
		795.76	3.739E-02	%	5.815E-02	1.81E-02	G
		569.29	2.640E-02	%	2.356E-01	6.68E-02	G
		801.84	-3.481E-02	% P	6.089E-01	1.72E-01	G
CS-137	-9.5264E-03						
		661.62	-9.526E-03	&(	5.457E-02	1.58E-02	G
CE-139	1.0230E-02						
		165.85	1.023E-02	%(P	5.523E-02	1.65E-02	G
EU-152	6.7391E-02						
		121.78	6.739E-02	%(P	1.600E-01	4.84E-02	G K
		344.30	8.342E-03	%	1.216E-01	3.51E-02	G
		1408.08	0.000E+00	&	1.324E-01	3.03E-02	G
		964.00	-5.802E-02	% P	4.113E-01	1.17E-01	G
		1112.07	1.050E-01	%	4.129E-01	1.20E-01	G
		778.90	-9.646E-02	% P	4.310E-01	1.26E-01	G
EU-154	-1.1242E-03						
		123.10	-1.124E-03	&(P	1.088E-01	3.22E-02	G K
		1274.80	2.817E-02	%	1.852E-01	5.26E-02	G
		723.30	-4.446E-02	% P	2.731E-01	7.88E-02	G
		1004.80	-2.700E-02	%	3.406E-01	9.60E-02	G
EU-155	-4.6280E-02						
		86.45	-4.628E-02	%(P	2.582E-01	7.72E-02	G K
		105.31	-1.686E-03	%	2.603E-01	7.73E-02	G
HG-203	1.4105E-02						
		279.17	1.410E-02	%(P	5.694E-02	1.69E-02	G K
		72.87	-1.036E+00	%	2.563E+00	7.76E-01	G
		70.83	-1.187E-02	%	4.575E+00	1.36E+00	G
		82.50	-1.378E+00	%	4.843E+00	1.46E+00	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	2.9602E-01						
		583.14	2.960E-01	(P	7.028E-02	3.49E-02	G
		510.72	5.264E-01	+	1.904E-01	8.42E-02	G
PB-212	6.7892E-01						
		238.63	6.536E-01	(	1.122E-01	4.30E-02	G K
							Energy duplication
		77.11	7.413E-01	*(	5.998E-01	1.87E-01	G
		74.81	9.884E-01	& P	1.232E+00	3.78E-01	G
PB-214	4.5307E-01						
		351.99	4.157E-01	(P	1.190E-01	4.46E-02	G K
		295.22	5.254E-01	(	2.084E-01	7.29E-02	G
							Energy duplication
		77.11	1.212E+00	+	9.810E-01	3.06E-01	G
		241.92	4.207E-01	%	7.077E-01	2.16E-01	G
BI-212	3.9531E-01						
		727.17	3.953E-01	(	4.178E-01	1.50E-01	G K
		1620.56	-4.445E-01	% P	1.958E+00	5.42E-01	G
		785.42	1.352E+00	% P	2.255E+00	7.00E-01	G
BI-214	5.1373E-01						
		609.32	5.137E-01	@(	9.819E-02	5.08E-02	G K
		1764.51	-1.678E-03	% P	1.427E-01	1.94E-02	G
		1120.28	7.085E-01	+	4.367E-01	1.79E-01	G
RA-224	3.8979E-01						
		241.00	3.898E-01	%(P	7.239E-01	2.20E-01	G
RA-226	1.2006E+00						
		185.99	1.201E+00	*(P	1.276E+00	3.96E-01	G
AC-228	8.2118E-01						
		911.07	7.947E-01	(P	1.458E-01	8.20E-02	G K
		968.90	8.566E-01	@(P	2.981E-01	1.42E-01	G
		338.40	8.335E-01	(	4.133E-01	1.76E-01	G
TH-227	-1.8429E-01						
		236.00	-1.843E-01	&(P	4.970E-01	1.50E-01	G K
		256.25	-1.519E-01	&	5.913E-01	1.76E-01	G
PA-234	1.5067E-02						
		98.44	1.507E-02	%(	2.549E-01	7.60E-02	G K
		946.00	1.007E-01	%	2.689E-01	8.01E-02	G
		131.28	-1.186E-03	&	2.388E-01	7.09E-02	G
		94.67	-8.917E-02	%	4.802E-01	1.44E-01	G
		883.24	-6.654E-02	%	4.438E-01	1.27E-01	G
		926.70	-3.487E-02	&	4.643E-01	1.30E-01	G

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 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26 3.793E-02 %   3.398E-01 9.63E-02 G

TH-234       6.5043E-01
                           63.29 6.504E-01 &(P 4.509E+00 1.35E+00 G K
                           92.80 1.388E+00 %   2.491E+00 7.58E-01 G
                           92.38 1.597E+00 % P 2.961E+00 9.00E-01 G

AM-241      -8.6550E-02
                           59.54-8.655E-02 %(  5.491E-01 1.64E-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	9.6228E-03	1.1144E-02	4.0827E-01	4.0828E-01	4.112E-01
K-40		1.4079E+01	1.4079E+01	1.8102E+00	1.9751E+00	5.295E-01
MN-54	#A	-4.4434E-04	-4.5563E-04	3.5226E-01	3.5226E-01	5.165E-02
CO-57	#B	2.4493E-02	2.5214E-02	4.9283E-02	4.9303E-02	5.266E-02
CO-60	#B	1.5526E-02	1.5589E-02	4.7792E-02	4.7800E-02	5.483E-02

Sr-85	#A	8.5465E-04	9.6443E-04	4.7478E-02	4.7478E-02	4.892E-02
Kr-85	#A	8.9517E+01	8.9524E+01	9.2719E+02	9.2720E+02	1.072E+03
Y-88	#B	8.8428E-03	9.5172E-03	5.2851E-02	5.2854E-02	5.971E-02
NB-94	#B	0.0000E+00	0.0000E+00	5.7365E-02	5.7365E-02	6.757E-02
Ag-108M	#B	-7.9134E-03	-7.9147E-03	5.1128E-02	5.1130E-02	5.919E-02
CD-109	#A	3.3532E-01	3.4116E-01	1.9866E+00	1.9867E+00	2.173E+00
SN-113	#B	2.3974E-02	2.5662E-02	6.4341E-02	6.4357E-02	6.688E-02
SB-125	#B	9.0389E-02	9.1092E-02	1.0390E-01	1.0402E-01	1.314E-01
I-131	#B	1.6877E-02	4.4724E-02	1.1080E-01	1.1083E-01	4.653E-02
CS-134	#B	2.0021E-02	2.0231E-02	3.6470E-02	3.6488E-02	3.945E-02
CS-137	#A	-9.5196E-03	-9.5264E-03	4.7285E-02	4.7288E-02	5.453E-02
CE-139	#A	9.6633E-03	1.0230E-02	4.9457E-02	4.9460E-02	5.217E-02
EU-152	#B	6.7277E-02	6.7391E-02	1.4515E-01	1.4520E-01	1.598E-01
EU-154	#B	-1.1213E-03	-1.1242E-03	1.4017E-01	1.4017E-01	1.085E-01
EU-155	#B	-4.6080E-02	-4.6280E-02	3.1006E-01	3.1008E-01	2.571E-01
HG-203	#B	1.1921E-02	1.4105E-02	5.0841E-02	5.0847E-02	4.813E-02
TL-208		2.9602E-01	2.9602E-01	1.0461E-01	1.0592E-01	
PB-212	#	6.7892E-01	6.7892E-01	1.3402E-01	1.3933E-01	1.122E-01
PB-214	#	4.5307E-01	4.5307E-01	1.1922E-01	1.2190E-01	1.190E-01
BI-212	A	3.9531E-01	3.9531E-01	4.5032E-01	4.5087E-01	
BI-214	#	5.1373E-01	5.1373E-01	1.5223E-01	1.5494E-01	
RA-224	A	3.8979E-01	3.8979E-01	6.6102E-01	6.6138E-01	7.239E-01
RA-226	#A	1.2006E+00	1.2006E+00	1.1872E+00	1.1891E+00	1.276E+00
AC-228		8.2118E-01	8.2118E-01	2.3598E-01	2.4044E-01	
TH-227	#B	-1.8429E-01	-1.8429E-01	4.5581E-01	4.5593E-01	4.970E-01
PA-234	#B	1.5067E-02	1.5067E-02	2.2794E-01	2.2794E-01	2.549E-01
TH-234	#B	6.5043E-01	6.5043E-01	4.0412E+00	4.0414E+00	4.509E+00
AM-241	#A	-8.6546E-02	-8.6550E-02	4.9079E-01	4.9082E-01	5.490E-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 (295.2 to 1999.0 keV) 1.6105661E+01 pCi/gm
Total Decayed Activity (295.2 to 1999.0 keV) 1.6105661E+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_8AUG2006-1543.An1

Sample description
FSS-OOL-10-04-002-F

Spectrum Filename: C:\GammaVision\Spectra\102F_8AUG2006-1543.An1

Acquisition information
Start time: 08-Aug-2006 15:43:12
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: 1.9810E+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	27-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. 16 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.6473

***** 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	160.	26.84	1.50	9.541E-03				
77.18	160.	26.84	1.50	9.541E-03	77.11	17.500	6.541E-01	PB212
					77.11	10.700	1.070E+00	PB214
77.18	160.	26.84	1.50	9.541E-03				
77.18	160.	26.84	1.50	9.541E-03	77.11	17.500	PBC<MDA	PB212
					77.11	10.700	1.070E+00	PB214
186.34	119.	31.21	1.00	1.625E-02	185.99	3.280	1.462E+00	RA226
210.62	62.	37.13	1.10	1.513E-02				
239.15	528.	5.43	1.22	1.379E-02	238.63	43.100	6.051E-01	PB212
242.39	100.	20.35	1.22	1.364E-02	241.92	7.470	6.659E-01	PB214
271.22	70.	29.43	1.65	1.239E-02				
295.59	134.	17.46	1.50	1.145E-02	295.22	19.200	4.152E-01	PB214
339.07	143.	18.00	0.95	1.004E-02	338.40	12.010	8.051E-01	AC228
352.74	259.	10.59	1.43	9.658E-03	351.99	37.100	4.913E-01	PB214
463.70	70.	25.35	1.21	7.362E-03	463.51	10.000	6.394E-01	SB125
511.50	83.	21.87	0.95	6.685E-03	510.72	22.500	3.759E-01	TL208
584.24	168.	11.28	1.70	5.879E-03	583.14	86.000	2.264E-01	TL208
610.63	168.	9.47	1.72	5.638E-03	609.32	46.090	4.415E-01	BI214
727.72	34.	38.04	1.38	4.794E-03	727.17	11.800	PBC<MDA	BI212
795.95	28.	35.70	0.92	4.419E-03	795.76	85.400	5.081E-02	CS134
862.66	41.	29.70	1.24	4.114E-03				
912.81	106.	13.45	1.34	3.915E-03				
969.60	96.	20.71	1.68	3.716E-03	968.90	17.460	1.008E+00	AC228
1463.37	537.	4.39	1.70	2.617E-03	1460.75	10.700	1.306E+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	
420.86	210.62	211.	62.	0.031	111.38	1.099	TH-227	sM
477.93	238.97	147.	528.	0.264	16.30	1.215	PB-212	D

Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM	Suspected	
484.40	242.21	155.	100.	0.050	61.05	1.217	PB-214	D
542.07	271.22	140.	69.	0.035	80.58	1.649	PA-234	sM
1725.40	862.66	28.	44.	0.022	69.08	1.244	TL-208	M
1825.76	912.81	29.	106.	0.053	36.15	1.338	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	153.80	77.11	844.	160.	0.080	80.53	1.500D
PB-214	153.80	77.11	844.	160.	0.080	80.53	1.500D
RA-226	372.13	186.26	431.	79.	0.040	109.44	1.500s
PB-212	477.83	239.10	374.	445.	0.222	23.29	1.500
PB-214	484.10	242.23	371.	80.	0.040	107.14	1.500s
PB-214	591.25	295.80	154.	131.	0.065	48.07	1.500s
AC-228	677.58	338.95	133.	98.	0.049	58.18	1.500
PB-214	704.87	352.59	135.	225.	0.112	29.68	1.500s
SB-125	927.11	463.68	57.	41.	0.021	86.68	1.500
TL-208	1022.78	511.50	77.	83.	0.041	65.60	0.945s
TL-208	1168.30	584.24	67.	168.	0.084	33.84	1.701s
BI-214	1221.11	610.63	34.	168.	0.084	28.42	1.718
BI-212	1455.39	727.72	48.	34.	0.017	114.13	1.380s
CS-134	1592.61	796.29	29.	23.	0.011	117.14	1.601s
AC-228	1941.81	970.80	48.	58.	0.029	63.83	1.718
K-40	2927.78	1463.43	10.	505.	0.253	13.61	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		2.4539E-02					
			477.56	2.454E-02	%(	4.215E-01 1.20E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
K-40	1.2291E+01						
		1460.75	1.229E+01	(P	4.271E-01	5.58E-01	G
MN-54	-4.3723E-03						
		834.81	-4.372E-03	&(P	5.105E-02	1.43E-02	G
CO-57	3.8088E-03						
		122.07	3.809E-03	%(	4.936E-02	1.46E-02	G K
		136.43	4.739E-02	&	4.173E-01	1.24E-01	G
CO-60	-2.2740E-03						
		1332.51	-2.274E-03	%(P	5.839E-02	1.59E-02	G K
		1173.23	1.283E-02	&	5.819E-02	1.67E-02	G K
Sr-85	0.0000E+00						
		514.00	0.000E+00	%(	5.406E-02	1.54E-02	G
Kr-85	0.0000E+00						
		513.99	0.000E+00	%(	1.095E+03	3.13E+02	G
Y-88	-1.0344E-02						
		1836.01	-1.034E-02	%(P	6.090E-02	1.67E-02	G K
		898.02	-1.150E-02	% P	6.223E-02	1.77E-02	G
NB-94	-6.9458E-03						
		871.10	-6.946E-03	%(	4.969E-02	1.41E-02	G K
		702.50	6.156E-03	%	4.169E-02	1.19E-02	G K
Ag-108M	-1.1842E-02						
		722.95	-1.184E-02	&(	5.875E-02	1.71E-02	G K
		614.37	-3.455E-02	% P	7.048E-02	2.14E-02	G
		433.93	-1.414E-03	%	4.359E-02	1.25E-02	G
CD-109	-3.5595E-02						
		88.04	-3.560E-02	%(P	2.082E+00	6.19E-01	G
SN-113	1.4390E-02						
		391.71	1.439E-02	&(	5.716E-02	1.68E-02	G K
		255.04	8.545E-02	&	1.594E+00	4.64E-01	G
SB-125	1.1533E-01						
		427.95	2.342E-02	%(P	1.291E-01	3.76E-02	G K
		600.77	-3.493E-02	& P	2.158E-01	6.18E-02	G
		636.15	-5.507E-02	% P	4.185E-01	1.20E-01	G
		463.51	3.874E-01	(P	3.547E-01	1.16E-01	G
		176.29	6.167E-02	& P	6.222E-01	1.84E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
I-131	2.8232E-02						
		364.48	2.823E-02	%(	1.138E-01	3.35E-02	G K
		636.97	-3.552E-01	&	1.814E+00	5.27E-01	G
		284.29	-4.583E-02	%	1.601E+00	4.65E-01	G
CS-134	2.5872E-02						
		604.66	1.180E-02	&(	3.108E-02	9.24E-03	G K
		795.76	4.196E-02	(	5.058E-02	1.64E-02	G
		569.29	5.135E-02	%	2.385E-01	6.91E-02	G
		801.84	2.153E-02	& P	5.333E-01	1.48E-01	G
CS-137	-1.8223E-03						
		661.62	-1.822E-03	%(	4.267E-02	1.18E-02	G
CE-139	1.2946E-02						
		165.85	1.295E-02	%(P	5.038E-02	1.51E-02	G
EU-152	-1.0408E-03						
		121.78	-1.041E-03	%(P	1.528E-01	4.52E-02	G K
		344.30	-1.303E-02	&	1.477E-01	4.31E-02	G
		1408.08	-2.289E-02	%	2.203E-01	5.94E-02	G
		964.00	-4.777E-03	& P	4.759E-01	1.34E-01	G
		1112.07	1.626E-01	%	5.037E-01	1.49E-01	G
		778.90	3.192E-02	% P	3.616E-01	1.02E-01	G
EU-154	9.0828E-03						
		123.10	9.083E-03	&(P	1.100E-01	3.27E-02	G K
		1274.80	-1.606E-02	%	1.682E-01	4.68E-02	G
		723.30	-5.668E-02	% P	2.664E-01	7.74E-02	G
		1004.80	1.191E-02	&	2.598E-01	7.09E-02	G
EU-155	-6.6605E-03						
		86.45	-6.660E-03	%(P	2.505E-01	7.44E-02	G K
		105.31	-2.049E-02	%	2.364E-01	7.04E-02	G
HG-203	1.2048E-02						
		279.17	1.205E-02	%(P	5.136E-02	1.52E-02	G K
		72.87	-6.923E-01	&	2.338E+00	7.04E-01	G
		70.83	-9.574E-01	&	2.915E+00	8.76E-01	G
		82.50	-7.800E-01	%	4.795E+00	1.44E+00	G
TL-208	2.2637E-01						
		583.14	2.264E-01	@(P	5.498E-02	2.56E-02	G
		510.72	3.759E-01	+	1.975E-01	8.23E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
PB-212	5.0996E-01						
		238.63	5.100E-01	(	1.064E-01	3.96E-02	G K
							Energy duplication
		77.11	6.541E-01	+	5.640E-01	1.76E-01	G
		74.81	4.894E-01	& P	1.162E+00	3.51E-01	G
PB-214	4.3310E-01						
		351.99	4.265E-01	*(P	1.082E-01	4.23E-02	G K
		295.22	4.054E-01	*(	1.878E-01	6.50E-02	G
							Energy duplication
		77.11	1.070E+00	+	9.225E-01	2.87E-01	G
		241.92	5.370E-01	(	6.184E-01	1.92E-01	G
BI-212	4.1602E-01						
		727.17	4.160E-01	*(	4.200E-01	1.58E-01	G K
		1620.56	3.793E-01	% P	1.577E+00	4.36E-01	G
		785.42	2.986E-01	% P	2.524E+00	7.19E-01	G
BI-214	4.4145E-01						
		609.32	4.415E-01	(	7.881E-02	4.19E-02	G K
		1764.51	-3.326E-02	& P	3.690E-01	9.90E-02	G
		1120.28	-1.241E-01	&	5.071E-01	1.48E-01	G
RA-224	5.2685E-03						
		241.00	5.269E-03	%(P	6.779E-01	1.95E-01	G
RA-226	1.0163E+00						
		185.99	1.016E+00	(P	1.272E+00	3.92E-01	G
AC-228	2.9669E-01						
		911.07	-1.373E-03	%(P	1.935E-01	5.36E-02	G K
		968.90	6.135E-01	(P	3.680E-01	1.31E-01	G
		338.40	5.558E-01	(	3.188E-01	1.08E-01	G
TH-227	-1.7057E-01						
		236.00	-1.706E-01	&(P	4.445E-01	1.34E-01	G K
		256.25	2.132E-01	%	5.044E-01	1.52E-01	G
PA-234	-7.5165E-02						
		98.44	-7.517E-02	%(	2.311E-01	6.96E-02	G K
		946.00	4.751E-02	%	2.088E-01	5.97E-02	G
		131.28	9.715E-02	%	2.022E-01	6.13E-02	G
		94.67	-4.205E-03	&	4.257E-01	1.27E-01	G
		883.24	6.889E-02	&	4.201E-01	1.20E-01	G
		926.70	0.000E+00	&	4.953E-01	1.37E-01	G
		569.26	7.633E-02	%	3.495E-01	1.01E-01	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments

TH-234       2.2397E-02
                           63.29 2.240E-02 %(P 4.396E+00 1.30E+00 G K
                           92.80 1.322E+00 %   2.296E+00 6.99E-01 G
                           92.38 1.481E+00 % P 2.751E+00 8.36E-01 G

AM-241       1.1773E-01
                           59.54 1.177E-01 &(  5.701E-01 1.70E-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	2.0931E-02	2.4539E-02	3.6027E-01	3.6027E-01	3.595E-01
K-40		1.2291E+01	1.2291E+01	1.6728E+00	1.8094E+00	4.271E-01
MN-54	#A	-4.2550E-03	-4.3723E-03	5.0526E-02	5.0527E-02	4.968E-02
CO-57	#B	3.6909E-03	3.8088E-03	4.3926E-02	4.3927E-02	4.783E-02
CO-60	#B	-2.2640E-03	-2.2740E-03	5.6170E-02	5.6170E-02	5.813E-02
Sr-85	#A	0.0000E+00	0.0000E+00	4.6313E-02	4.6313E-02	4.742E-02

Kr-85	#A	0.0000E+00	0.0000E+00	9.3801E+02	9.3801E+02	1.095E+03
Y-88	#B	-9.5522E-03	-1.0344E-02	5.0426E-02	5.0429E-02	5.624E-02
NB-94	#B	-6.9458E-03	-6.9458E-03	4.2364E-02	4.2366E-02	4.969E-02
Ag-108M	#B	-1.1840E-02	-1.1842E-02	5.1285E-02	5.1289E-02	5.874E-02
CD-109	#A	-3.4935E-02	-3.5595E-02	7.9091E+00	7.9091E+00	2.043E+00
SN-113	#B	1.3366E-02	1.4390E-02	5.0510E-02	5.0516E-02	5.309E-02
SB-125	#B	1.1436E-01	1.1533E-01	1.0369E-01	1.0389E-01	1.280E-01
I-131	#B	9.8186E-03	2.8232E-02	1.0054E-01	1.0055E-01	3.957E-02
CS-134	#B	2.5582E-02	2.5872E-02	3.0306E-02	3.0341E-02	3.074E-02
CS-137	#A	-1.8209E-03	-1.8223E-03	3.5405E-02	3.5405E-02	4.264E-02
CE-139	#A	1.2171E-02	1.2946E-02	4.5236E-02	4.5242E-02	4.737E-02
EU-152	#B	-1.0389E-03	-1.0408E-03	1.7169E+00	1.7169E+00	1.526E-01
EU-154	#B	9.0580E-03	9.0828E-03	9.8062E-02	9.8064E-02	1.097E-01
EU-155	#B	-6.6293E-03	-6.6605E-03	7.3546E+02	7.3546E+02	2.493E-01
HG-203	#B	1.0040E-02	1.2048E-02	4.5697E-02	4.5702E-02	4.280E-02
TL-208	#	2.2637E-01	2.2637E-01	7.6799E-02	7.7843E-02	
PB-212	#	5.0996E-01	5.0996E-01	1.1878E-01	1.2218E-01	1.064E-01
PB-214	#	4.3310E-01	4.3310E-01	1.2878E-01	1.3105E-01	1.082E-01
BI-212	#A	4.1602E-01	4.1602E-01	4.7479E-01	4.7536E-01	
BI-214		4.4145E-01	4.4145E-01	1.2545E-01	1.2787E-01	
RA-224	A	5.2685E-03	5.2685E-03	5.8474E-01	5.8474E-01	6.779E-01
RA-226	#A	1.0163E+00	1.0163E+00	1.1746E+00	1.1760E+00	1.272E+00
AC-228	F	2.9669E-01	2.9669E-01	1.7263E-01	1.7343E-01	1.935E-01
TH-227	#B	-1.7057E-01	-1.7057E-01	4.0809E-01	4.0820E-01	4.445E-01
PA-234	#B	-7.5165E-02	-7.5165E-02	2.0884E-01	2.0888E-01	2.311E-01
TH-234	#B	2.2397E-02	2.2397E-02	3.9135E+00	3.9135E+00	4.396E+00
AM-241	#A	1.1772E-01	1.1773E-01	5.1135E-01	5.1140E-01	5.701E-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 (271.2 to 1999.0 keV) 1.3671375E+01 pCi/gm
Total Decayed Activity (271.2 to 1999.0 keV) 1.3671375E+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_8AUG2006_1933.An1

Sample description
FSS-OOL-10-04-001-F

Spectrum Filename: C:\GammaVision\Spectra\102F_8AUG2006_1933.An1

Acquisition information
Start time: 08-Aug-2006 19:33:22
Live time: 2000
Real time: 2022
Dead time: 1.08 %
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: 2.2670E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 2.2670E+03) =
4.4111E+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	27-Jul-2006 09:36:00
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: 0.7381

***** 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	121.	37.17	1.50	8.847E-03				
75.03	121.	37.17	1.50	8.847E-03	74.81	9.600	PBC<MDA	PB212
77.18	190.	23.99	1.50	9.541E-03	77.11	10.700	1.108E+00	PB214
					77.11	17.500	6.772E-01	PB212
77.18	190.	23.99	1.50	9.541E-03	77.11	10.700	1.108E+00	PB214
					77.11	17.500	6.772E-01	PB212
93.11	123.	35.10	1.50	1.333E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	1.835E+00	TH234
93.13	125.	34.49	1.50	1.325E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
185.87	106.	30.07	1.48	1.627E-02				
185.87	106.	30.07	1.48	1.627E-02	185.99	3.280	PBC<MDA	RA226
210.04	78.	36.14	1.54	1.516E-02				
239.09	662.	4.64	1.22	1.379E-02	236.00	11.200	2.529E+00	TH227
					238.63	43.100	6.632E-01	PB212
242.20	116.	18.26	1.22	1.364E-02	241.00	3.900	1.281E+00	RA224
					241.92	7.470	6.775E-01	PB214
271.22	75.	30.41	1.08	1.239E-02				
295.83	168.	11.70	1.26	1.144E-02	295.22	19.200	4.547E-01	PB214
301.05	48.	32.27	1.26	1.126E-02				
328.26	56.	31.80	1.50	1.036E-02				
339.14	171.	15.14	1.41	1.004E-02	338.40	12.010	8.452E-01	AC228
352.62	244.	8.81	1.36	9.662E-03	351.99	37.100	4.046E-01	PB214
464.15	54.	33.70	1.06	7.355E-03	463.51	10.000	4.282E-01	SB125
511.54	133.	17.62	0.88	6.684E-03	510.72	22.500	5.255E-01	TL208
584.17	210.	10.26	1.30	5.880E-03	583.14	86.000	2.462E-01	TL208
610.38	229.	9.14	1.38	5.640E-03	609.32	46.090	5.238E-01	BI214

662.65	24.	37.81	1.11	5.229E-03	661.62	84.620	PBC<MDA	CS137
729.09	79.	20.72	1.18	4.783E-03				
769.69	32.	36.14	1.32	4.554E-03				
862.61	28.	33.50	0.89	4.114E-03				
912.87	115.	15.53	1.52	3.915E-03				
936.13	40.	28.13	1.35	3.830E-03				
970.35	110.	14.83	1.56	3.713E-03	968.90	17.460	1.010E+00	AC228
1463.31	589.	4.33	1.73	2.617E-03	1460.75	10.700	1.252E+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
419.70	210.04	295.	78.	0.039	108.42	1.544	NP-239 sM
477.82	239.03	140.	662.	0.331	13.91	1.215	PB-212 D
484.04	242.14	166.	116.	0.058	54.78	1.217	PB-214 D
542.09	271.22	183.	75.	0.037	91.24	1.085	PA-234 sM
601.73	301.04	118.	45.	0.023	115.24	0.878	PB-212 M
656.20	328.26	113.	56.	0.028	95.41	1.499	RH-106M sM
1458.13	729.09	54.	80.	0.040	51.19	1.177	J-132 sM
1725.30	862.61	24.	28.	0.014	100.51	0.888	- sM
1825.89	912.87	50.	116.	0.058	37.81	1.517	AC-228 M
1872.42	936.13	26.	40.	0.020	72.71	1.351	AG-110M sM
1940.91	970.35	38.	111.	0.055	37.15	1.557	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	149.63	75.03	1008.	121.	0.061	111.50	1.500s
PB-214	153.80	77.11	940.	190.	0.095	71.96	1.500D
PB-212	153.80	77.11	940.	190.	0.095	71.96	1.500D
TH-234	185.83	93.13	890.	125.	0.063	103.46	1.500s
TH-234	185.80	93.11	872.	123.	0.062	105.30	1.500s
RA-226	372.10	186.25	497.	89.	0.045	104.89	1.500s
TH-227	477.81	239.09	199.	681.	0.340	14.47	1.500s
PB-212	477.78	239.07	401.	609.	0.305	18.49	1.500
PB-214	591.38	295.86	208.	167.	0.083	43.47	1.500
AC-228	677.66	338.99	134.	144.	0.072	42.28	1.500
PB-214	704.90	352.61	120.	249.	0.125	26.61	1.500s
SB-125	927.52	463.89	90.	38.	0.019	110.98	1.500
TL-208	1022.87	511.54	109.	133.	0.066	52.87	0.878s
TL-208	1168.17	584.17	75.	209.	0.105	30.78	1.305
BI-214	1220.62	610.38	67.	229.	0.114	27.41	1.378
CS-137	1325.20	662.65	28.	24.	0.012	113.44	1.108
K-40	2927.55	1463.32	14.	563.	0.281	12.96	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		-9.3023E-02					
			477.56	-9.302E-02	%(	4.499E-01 1.32E-01	G
K-40		1.1961E+01					
			1460.75	1.196E+01	(P	4.342E-01 5.17E-01	G
MN-54		1.5810E-03					
			834.81	1.581E-03	%(P	4.749E-02 1.33E-02	G
CO-57		-5.7484E-04					
			122.07	-5.748E-04	%(	4.825E-02 1.43E-02	G K
			136.43	-6.733E-03	&	3.251E-01 9.60E-02	G
CO-60		-1.1148E-02					
			1332.51	-1.115E-02	%(P	5.978E-02 1.71E-02	G K
			1173.23	0.000E+00	&	7.189E-02 2.03E-02	G K
Sr-85		-7.6462E-03					
			514.00	-7.646E-03	&(	5.549E-02 1.62E-02	G
Kr-85		2.1516E+01					
			513.99	2.152E+01	&(	9.970E+02 2.86E+02	G
Y-88		-1.9868E-05					
			1836.01	-1.987E-05	%(P	8.222E-02 2.25E-02	G K
			898.02	-4.403E-03	% P	5.560E-02 1.55E-02	G
NB-94		5.3106E-03					
			871.10	5.311E-03	&(	3.756E-02 1.06E-02	G K
			702.50	-7.380E-03	%	4.260E-02 1.23E-02	G K
Ag-108M		1.2916E-02					
			722.95	1.292E-02	%(	4.448E-02 1.31E-02	G K
			614.37	-3.930E-02	% P	6.246E-02 1.92E-02	G
			433.93	0.000E+00	%	4.735E-02 1.37E-02	G
CD-109		-1.2983E-01					
			88.04	-1.298E-01	%(P	1.980E+00 5.91E-01	G
SN-113		1.3831E-02					
			391.71	1.383E-02	%(	5.797E-02 1.71E-02	G K
			255.04	4.422E-01	%	1.676E+00 5.00E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	9.6790E-02						
		427.95	2.417E-02	&(P	1.275E-01	3.73E-02	G K
		600.77	5.341E-03	% P	2.145E-01	6.06E-02	G
		636.15	-4.850E-03	& P	3.426E-01	9.60E-02	G
		463.51	3.117E-01	(P	3.825E-01	1.20E-01	G
		176.29	-3.689E-02	& P	5.306E-01	1.56E-01	G
I-131	-1.7531E-02						
		364.48	-1.753E-02	%(	1.289E-01	3.78E-02	G K
		636.97	-1.714E-03	&	1.462E+00	4.07E-01	G
		284.29	-2.800E-01	%	1.584E+00	4.68E-01	G
CS-134	6.4362E-03						
		604.66	6.436E-03	%(	4.332E-02	1.25E-02	G K
		795.76	2.963E-02	%	5.270E-02	1.62E-02	G
		569.29	-3.850E-02	%	3.071E-01	8.93E-02	G
		801.84	-1.635E-01	% P	6.148E-01	1.81E-01	G
CS-137	3.2894E-02						
		661.62	3.289E-02	(	3.666E-02	1.25E-02	G
CE-139	-1.1758E-03						
		165.85	-1.176E-03	%(P	5.049E-02	1.49E-02	G
EU-152	1.8734E-02						
		121.78	1.873E-02	%(P	1.516E-01	4.53E-02	G K
		344.30	-3.677E-03	%	1.424E-01	4.15E-02	G
		1408.08	0.000E+00	%	2.922E-01	8.01E-02	G
		964.00	-5.363E-02	% P	3.227E-01	9.17E-02	G
		1112.07	1.702E-02	%	4.058E-01	1.13E-01	G
		778.90	-6.026E-02	% P	3.616E-01	1.04E-01	G
EU-154	1.0264E-02						
		123.10	1.026E-02	%(P	1.127E-01	3.36E-02	G K
		1274.80	2.513E-02	&	1.543E-01	4.38E-02	G
		723.30	1.246E-02	% P	3.050E-01	8.78E-02	G
		1004.80	-3.905E-02	%	3.155E-01	9.00E-02	G
EU-155	7.3245E-02						
		86.45	7.324E-02	%(P	2.212E-01	6.67E-02	G K
		105.31	7.380E-02	%	2.321E-01	6.99E-02	G
HG-203	4.3384E-04						
		279.17	4.338E-04	&(P	4.151E-02	1.20E-02	G K
		72.87	-2.929E-01	%	2.181E+00	6.54E-01	G
		70.83	-1.632E+00	&	4.114E+00	1.24E+00	G
		82.50	-3.299E-01	&	4.083E+00	1.22E+00	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	2.4618E-01						
		583.14	2.462E-01	(P	5.062E-02	2.54E-02	G
		510.72	5.255E-01	+	2.034E-01	9.28E-02	G
PB-212	6.2968E-01						
		238.63	6.104E-01	(	9.616E-02	3.76E-02	G K
							Energy duplication
		77.11	6.772E-01	@(	5.198E-01	1.62E-01	G
		74.81	8.513E-01	+ P	1.058E+00	3.24E-01	G
PB-214	4.2621E-01						
		351.99	4.134E-01	@(P	8.938E-02	3.67E-02	G K
		295.22	4.510E-01	(	1.893E-01	6.53E-02	G
							Energy duplication
		77.11	1.108E+00	+	8.502E-01	2.66E-01	G
		241.92	2.662E-01	%	6.499E-01	1.96E-01	G
BI-212	-1.5688E-02						
		727.17	-1.569E-02	%(	4.365E-01	1.24E-01	G K
		1620.56	-1.070E-01	% P	1.776E+00	4.66E-01	G
		785.42	-2.657E-01	% P	2.299E+00	6.56E-01	G
BI-214	5.2381E-01						
		609.32	5.238E-01	(	9.366E-02	4.79E-02	G K
		1764.51	-5.845E-02	% P	3.716E-01	1.03E-01	G
		1120.28	2.653E-01	&	4.208E-01	1.31E-01	G
RA-224	6.5730E-02						
		241.00	6.573E-02	%(P	1.244E+00	3.69E-01	G
RA-226	9.9990E-01						
		185.99	9.999E-01	*(P	1.191E+00	3.67E-01	G
AC-228	2.0187E-01						
		911.07	-8.986E-03	%(P	1.826E-01	5.14E-02	G K
		968.90	-5.435E-03	% P	3.654E-01	1.04E-01	G
		338.40	7.110E-01	(	2.797E-01	1.00E-01	G
TH-227	2.6016E+00						
		236.00	2.602E+00	?(P	2.616E-01	1.26E-01	G K
		256.25	9.819E-02	&	5.291E-01	1.57E-01	G
PA-234	-4.5990E-03						
		98.44	-4.599E-03	&(	2.089E-01	6.21E-02	G K
		946.00	-2.594E-03	%	2.313E-01	6.39E-02	G
		131.28	0.000E+00	&	2.228E-01	6.62E-02	G
		94.67	-1.623E-01	%	4.025E-01	1.22E-01	G
		883.24	-4.045E-02	%	3.757E-01	1.06E-01	G
		926.70	-1.352E-02	&	4.409E-01	1.23E-01	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26-5.341E-02 %   4.523E-01 1.31E-01 G

TH-234       1.3444E+00
                           63.29 4.065E-01 %(P 4.178E+00 1.25E+00 G K
                           92.80 1.835E+00 @(  2.091E+00 6.44E-01 G
                           92.38 2.195E+00 @(P 2.482E+00 7.64E-01 G

AM-241      -2.4112E-02
                           59.54-2.411E-02 &(  5.764E-01 1.71E-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	-7.9178E-02	-9.3023E-02	3.9631E-01	3.9634E-01	3.829E-01
K-40		1.1961E+01	1.1961E+01	1.5509E+00	1.6899E+00	4.342E-01
MN-54	#A	1.5380E-03	1.5810E-03	3.9876E-02	3.9876E-02	4.620E-02
CO-57	#B	-5.5681E-04	-5.7484E-04	4.2900E-02	4.2900E-02	4.674E-02
CO-60	#B	-1.1098E-02	-1.1148E-02	5.2762E-02	5.2766E-02	5.951E-02

Sr-85	#A	-6.6959E-03	-7.6462E-03	4.8708E-02	4.8710E-02	4.859E-02
Kr-85	#A	2.1514E+01	2.1516E+01	8.5864E+02	8.5864E+02	9.969E+02
Y-88	#B	-1.8328E-05	-1.9868E-05	8.8437E-04	8.8437E-04	7.584E-02
NB-94	#B	5.3106E-03	5.3106E-03	3.1711E-02	3.1712E-02	3.756E-02
Ag-108M	#B	1.2913E-02	1.2916E-02	3.9207E-02	3.9213E-02	4.447E-02
CD-109	#A	-1.2739E-01	-1.2983E-01	2.3911E+00	2.3911E+00	1.943E+00
SN-113	#B	1.2834E-02	1.3831E-02	5.1352E-02	5.1358E-02	5.379E-02
SB-125	#B	9.5970E-02	9.6790E-02	1.1177E-01	1.1190E-01	1.264E-01
I-131	#B	-6.0113E-03	-1.7531E-02	1.1329E-01	1.1330E-01	4.419E-02
CS-134	#B	6.3630E-03	6.4362E-03	3.7603E-02	3.7605E-02	4.282E-02
CS-137	A	3.2868E-02	3.2894E-02	3.7313E-02	3.7359E-02	
CE-139	#A	-1.1044E-03	-1.1758E-03	6.3641E-02	6.3641E-02	4.743E-02
EU-152	#B	1.8699E-02	1.8734E-02	1.3577E-01	1.3577E-01	1.514E-01
EU-154	#B	1.0235E-02	1.0264E-02	1.0083E-01	1.0083E-01	1.124E-01
EU-155	#B	7.2898E-02	7.3245E-02	1.9997E-01	2.0001E-01	2.202E-01
HG-203	#B	3.6067E-04	4.3384E-04	3.6032E-02	3.6032E-02	3.451E-02
TL-208		2.4618E-01	2.4618E-01	7.5929E-02	7.7176E-02	
PB-212	#	6.2968E-01	6.2968E-01	1.1645E-01	1.2170E-01	9.616E-02
PB-214	#	4.2621E-01	4.2621E-01	1.0866E-01	1.1126E-01	8.938E-02
BI-212	#B	-1.5688E-02	-1.5688E-02	3.7337E-01	3.7337E-01	4.365E-01
BI-214		5.2381E-01	5.2381E-01	1.4359E-01	1.4657E-01	
RA-224	#A	6.5730E-02	6.5730E-02	1.1073E+00	1.1073E+00	1.244E+00
RA-226	#A	9.9989E-01	9.9990E-01	1.1010E+00	1.1025E+00	1.191E+00
AC-228	F	2.0187E-01	2.0187E-01	8.5349E-02	8.6097E-02	1.826E-01
TH-227	#	2.6016E+00	2.6016E+00	3.7652E-01	4.0383E-01	2.616E-01
PA-234	#B	-4.5990E-03	-4.5990E-03	1.8630E-01	1.8630E-01	2.089E-01
TH-234	#B	1.3444E+00	1.3444E+00	1.4039E+00	1.4059E+00	4.178E+00
AM-241	#A	-2.4111E-02	-2.4112E-02	5.1407E-01	5.1407E-01	5.764E-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) 1.2966086E+01 pCi/gm
Total Decayed Activity (271.2 to 1999.0 keV) 1.2966112E+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_14AUG2006_0939.An1

Sample description
FSS-OOL-10-04-013-F

Spectrum Filename: C:\GammaVision\Spectra\102F_14AUG2006_0939.An1

Acquisition information
Start time: 07-Aug-2006 09:39:26
Live time: 2000
Real time: 2025
Dead time: 1.23 %
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: 2.2410E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 2.2410E+03) =
4.4623E+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	27-Jul-2006 08:22:00
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: 0.7282

***** 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	204.	23.92	1.50	9.541E-03	77.11	10.700	1.203E+00	PB214
					77.11	17.500	7.358E-01	PB212
77.21	204.	23.92	1.50	9.541E-03	77.11	10.700	1.203E+00	PB214
					77.11	17.500	7.358E-01	PB212
93.31	89.	39.68	1.35	1.343E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	1.342E+00	TH234
129.04	113.	40.04	1.04	1.715E-02				
185.74	115.	27.97	1.53	1.628E-02				
185.74	115.	27.97	1.53	1.628E-02	185.99	3.280	PBC<MDA	RA226
239.00	745.	4.48	1.22	1.379E-02	238.63	43.100	7.553E-01	PB212
241.95	147.	18.98	1.22	1.365E-02	241.00	3.900	1.645E+00	RA224
					241.92	7.470	8.682E-01	PB214
295.55	205.	14.13	1.31	1.145E-02	295.22	19.200	5.621E-01	PB214
328.70	61.	26.88	1.97	1.035E-02				
338.94	141.	19.39	1.12	1.004E-02	338.40	12.010	7.037E-01	AC228
352.55	328.	8.83	1.19	9.664E-03	351.99	37.100	5.507E-01	PB214
423.98	35.	36.20	0.59	8.046E-03				
511.84	101.	18.02	1.57	6.681E-03	510.72	22.500	4.051E-01	TL208
584.10	200.	11.80	1.74	5.881E-03	583.14	86.000	2.375E-01	TL208
610.08	237.	9.68	1.74	5.643E-03	609.32	46.090	5.498E-01	BI214
728.16	45.	25.79	2.04	4.788E-03	727.17	11.800	4.797E-01	BI212
912.42	173.	10.50	1.60	3.917E-03	911.07	29.000	9.181E-01	AC228
970.37	109.	17.57	1.60	3.713E-03	968.90	17.460	1.008E+00	AC228
1122.06	82.	19.74	1.90	3.279E-03	1120.28	15.040	9.965E-01	BI214
1462.85	662.	3.90	1.69	2.618E-03	1460.75	10.700	1.423E+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	
257.67	129.04	728.	97.	0.048	122.04	1.044	AC-228	M
477.63	239.00	185.	745.	0.373	13.44	1.215	PB-212	D
483.53	241.95	315.	147.	0.073	56.95	1.217	PB-214	D
657.07	328.70	99.	61.	0.031	80.65	1.973	LA-140	s
3535.51	1767.02	0.	45.	0.023	44.72	0.947	XE-138	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	1086.	204.	0.102	71.77	1.500D
PB-212	153.80	77.11	1086.	204.	0.102	71.77	1.500D
TH-234	185.50	92.96	1063.	119.	0.059	118.53	1.500s
TH-234	185.45	92.94	1029.	121.	0.061	115.29	1.500s
RA-226	371.75	186.07	536.	92.	0.046	106.23	1.500s
PB-212	477.69	239.03	482.	625.	0.312	19.14	1.500
PB-214	483.58	241.98	491.	128.	0.064	78.25	1.500
PB-214	591.13	295.74	245.	185.	0.093	42.10	1.500
AC-228	677.56	338.94	209.	141.	0.071	58.16	1.123s
PB-214	704.84	352.58	157.	313.	0.156	23.98	1.500
TL-208	1023.46	511.84	80.	101.	0.051	54.06	1.567s
TL-208	1168.03	584.10	109.	199.	0.100	35.41	1.736
BI-214	1220.01	610.08	81.	237.	0.119	29.03	1.740
BI-212	1456.28	728.16	39.	45.	0.023	77.37	2.035s
AC-228	1824.99	912.42	41.	173.	0.087	31.51	1.602s
AC-228	1940.95	970.37	59.	109.	0.054	52.71	1.596
BI-214	2244.51	1122.06	49.	82.	0.041	59.22	1.900
K-40	2926.66	1462.88	2.	649.	0.324	11.80	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		1.9710E-01					
			477.56	1.971E-01	%(	3.683E-01 1.13E-01	G
K-40		1.3952E+01					
			1460.75	1.395E+01	(P	1.826E-01 5.49E-01	G
MN-54		-3.1137E-04					
			834.81	-3.114E-04	&(P	6.239E-02 1.77E-02	G
CO-57		1.4538E-02					
			122.07	1.454E-02	%(	5.530E-02 1.66E-02	G K
			136.43	-7.875E-02	&	4.470E-01 1.34E-01	G
CO-60		-1.2277E-02					
			1332.51	-1.228E-02	&(P	6.594E-02 1.89E-02	G K
			1173.23	3.842E-02	%	6.902E-02 2.12E-02	G K
Sr-85		-5.4453E-03					
			514.00	-5.445E-03	&(	5.333E-02 1.55E-02	G
Kr-85		-1.0979E+02					
			513.99	-1.098E+02	&(	1.094E+03 3.18E+02	G
Y-88		-1.9922E-05					
			1836.01	-1.992E-05	%(P	5.108E-02 1.30E-02	G K
			898.02	-5.798E-04	% P	4.817E-02 1.31E-02	G
NB-94		1.4764E-02					
			871.10	1.476E-02	%(	4.760E-02 1.40E-02	G K
			702.50	1.050E-02	%	4.302E-02 1.26E-02	G K
Ag-108M		8.3343E-03					
			722.95	8.334E-03	&(	4.753E-02 1.37E-02	G K
			614.37	-4.835E-02	% P	6.907E-02 2.14E-02	G
			433.93	-2.932E-03	&	4.633E-02 1.35E-02	G
CD-109		7.3517E-01					
			88.04	7.352E-01	%(P	2.011E+00 6.07E-01	G
SN-113		1.8940E-03					
			391.71	1.894E-03	&(	6.434E-02 1.86E-02	G K
			255.04	-8.947E-02	&	2.016E+00 5.94E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	-3.3752E-02						
		427.95	-3.375E-02	%(P	1.242E-01	3.65E-02	G K
		600.77	-3.464E-02	% P	1.996E-01	5.75E-02	G
		636.15	-1.137E-03	& P	3.374E-01	9.41E-02	G
		463.51	1.943E-01	% P	4.275E-01	1.29E-01	G
		176.29	-8.526E-03	% P	5.810E-01	1.71E-01	G
I-131	2.0111E-02						
		364.48	2.011E-02	&(	1.235E-01	3.64E-02	G K
		636.97	5.790E-01	&	1.355E+00	4.08E-01	G
		284.29	1.637E-02	&	1.523E+00	4.45E-01	G
CS-134	-1.2121E-02						
		604.66	-1.212E-02	&(	4.717E-02	1.39E-02	G K
		795.76	2.824E-02	%	4.843E-02	1.50E-02	G
		569.29	4.831E-02	&	2.855E-01	8.32E-02	G
		801.84	2.933E-03	% P	5.257E-01	1.47E-01	G
CS-137	3.6095E-02						
		661.62	3.609E-02	%(	5.822E-02	1.80E-02	G
CE-139	-1.2012E-03						
		165.85	-1.201E-03	%(P	5.672E-02	1.68E-02	G
EU-152	4.5721E-02						
		121.78	4.572E-02	&(P	1.568E-01	4.72E-02	G K
		344.30	-2.616E-02	%	1.528E-01	4.52E-02	G
		1408.08	-4.025E-02	%	2.614E-01	7.36E-02	G
		964.00	-2.552E-03	% P	4.459E-01	1.26E-01	G
		1112.07	1.506E-01	%	4.355E-01	1.29E-01	G
		778.90	7.071E-02	% P	3.838E-01	1.11E-01	G
EU-154	3.7432E-02						
		123.10	3.743E-02	%(P	1.066E-01	3.21E-02	G K
		1274.80	-2.522E-03	&	1.889E-01	5.27E-02	G
		723.30	2.875E-02	& P	2.225E-01	6.37E-02	G
		1004.80	0.000E+00	&	3.744E-01	1.06E-01	G
EU-155	6.8877E-02						
		86.45	6.888E-02	%(P	2.439E-01	7.34E-02	G K
		105.31	1.647E-02	%	2.297E-01	6.84E-02	G
HG-203	-1.0027E-02						
		279.17	-1.003E-02	%(P	5.955E-02	1.77E-02	G K
		72.87	-3.630E-01	%	2.336E+00	7.01E-01	G
		70.83	-1.059E+00	%	4.194E+00	1.26E+00	G
		82.50	6.171E-02	&	4.388E+00	1.31E+00	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	2.3749E-01						
		583.14	2.375E-01	(P	6.101E-02	2.81E-02	G
		510.72	4.051E-01	+	1.775E-01	7.32E-02	G
PB-212	6.6282E-01						
		238.63	6.332E-01	(	1.064E-01	4.04E-02	G K
							Energy duplication
		77.11	7.358E-01	@(	5.644E-01	1.76E-01	G
		74.81	8.352E-01	% P	1.174E+00	3.59E-01	G
PB-214	5.1932E-01						
		351.99	5.254E-01	(P	1.027E-01	4.20E-02	G K
		295.22	5.075E-01	(	2.073E-01	7.12E-02	G
							Energy duplication
		77.11	1.203E+00	+	9.231E-01	2.88E-01	G
		241.92	7.548E-01	+	6.263E-01	1.97E-01	G
BI-212	4.7968E-01						
		727.17	4.797E-01	(	3.391E-01	1.24E-01	G K
		1620.56	-1.974E-01	& P	1.781E+00	4.75E-01	G
		785.42	-5.923E-01	% P	2.851E+00	8.34E-01	G
BI-214	5.4980E-01						
		609.32	5.498E-01	(	1.032E-01	5.33E-02	G K
		1764.51	-1.475E-03	& P	1.254E-01	1.70E-02	G
		1120.28	9.965E-01	+	4.331E-01	1.97E-01	G
RA-224	4.5436E-01						
		241.00	4.544E-01	%(P	6.317E-01	1.96E-01	G
RA-226	1.0368E+00						
		185.99	1.037E+00	@(P	1.251E+00	3.85E-01	G
AC-228	9.5209E-01						
		911.07	9.181E-01	(P	1.722E-01	9.67E-02	G K
		968.90	1.008E+00	(P	3.589E-01	1.77E-01	G
		338.40	7.037E-01	-	3.498E-01	1.37E-01	G
TH-227	-1.8544E-01						
		236.00	-1.854E-01	%(P	4.503E-01	1.36E-01	G K
		256.25	6.932E-02	&	5.862E-01	1.74E-01	G
PA-234	3.7593E-02						
		98.44	3.759E-02	%(	2.397E-01	7.18E-02	G K
		946.00	2.808E-02	%	1.857E-01	5.20E-02	G
		131.28	2.771E-02	&	2.415E-01	7.22E-02	G
		94.67	-1.760E-01	%	4.420E-01	1.34E-01	G
		883.24	-1.327E-03	%	4.406E-01	1.24E-01	G
		926.70	0.000E+00	%	5.622E-01	1.59E-01	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26 7.076E-02 &   4.194E-01 1.22E-01 G

TH-234       1.4661E+00
                           63.29 7.660E-01 %(P 4.385E+00 1.31E+00 G K
                           92.80 1.831E+00  (  2.294E+00 7.04E-01 G
                           92.38 2.102E+00  (P 2.738E+00 8.39E-01 G

AM-241      -6.6325E-02
                           59.54-6.633E-02 &(  6.330E-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	1.7076E-01	1.9710E-01	3.3781E-01	3.3799E-01	3.191E-01
K-40		1.3952E+01	1.3952E+01	1.6469E+00	1.8236E+00	1.826E-01
MN-54	#A	-3.0382E-04	-3.1137E-04	2.2665E-02	2.2665E-02	6.087E-02
CO-57	#B	1.4131E-02	1.4538E-02	4.9849E-02	4.9855E-02	5.375E-02
CO-60	#B	-1.2229E-02	-1.2277E-02	5.8350E-02	5.8355E-02	6.568E-02

Sr-85	#A	-4.8384E-03	-5.4453E-03	4.6564E-02	4.6565E-02	4.739E-02
Kr-85	#A	-1.0979E+02	-1.0979E+02	9.5455E+02	9.5457E+02	1.093E+03
Y-88	#B	-1.8540E-05	-1.9922E-05	5.1196E-04	5.1196E-04	4.754E-02
NB-94	#B	1.4764E-02	1.4764E-02	4.2087E-02	4.2096E-02	4.760E-02
Ag-108M	#B	8.3329E-03	8.3343E-03	4.1138E-02	4.1141E-02	4.752E-02
CD-109	#A	7.2285E-01	7.3517E-01	1.8215E+00	1.8220E+00	1.977E+00
SN-113	#B	1.7720E-03	1.8940E-03	5.5910E-02	5.5910E-02	6.020E-02
SB-125	#B	-3.3498E-02	-3.3752E-02	1.2756E-01	1.2758E-01	1.232E-01
I-131	#B	7.7549E-03	2.0111E-02	1.0907E-01	1.0908E-01	4.762E-02
CS-134	#B	-1.1998E-02	-1.2121E-02	4.1702E-02	4.1708E-02	4.670E-02
CS-137	#A	3.6069E-02	3.6095E-02	5.3916E-02	5.3955E-02	5.818E-02
CE-139	#A	-1.1361E-03	-1.2012E-03	7.1254E-02	7.1254E-02	5.364E-02
EU-152	#B	4.5646E-02	4.5721E-02	1.4147E-01	1.4149E-01	1.565E-01
EU-154	#B	3.7339E-02	3.7432E-02	9.6385E-02	9.6407E-02	1.063E-01
EU-155	#B	6.8586E-02	6.8877E-02	2.2023E-01	2.2026E-01	2.429E-01
HG-203	#B	-8.5064E-03	-1.0027E-02	5.3750E-02	5.3753E-02	5.052E-02
TL-208		2.3749E-01	2.3749E-01	8.4260E-02	8.5307E-02	
PB-212	#	6.6282E-01	6.6282E-01	1.2685E-01	1.3219E-01	1.064E-01
PB-214	#	5.1932E-01	5.1932E-01	1.2467E-01	1.2803E-01	1.027E-01
BI-212		4.7968E-01	4.7968E-01	3.7115E-01	3.7212E-01	
BI-214		5.4980E-01	5.4980E-01	1.5958E-01	1.6254E-01	
RA-224	A	4.5436E-01	4.5436E-01	5.8681E-01	5.8736E-01	6.317E-01
RA-226	#A	1.0368E+00	1.0368E+00	1.1549E+00	1.1564E+00	1.251E+00
AC-228		9.5209E-01	9.5209E-01	2.9250E-01	2.9734E-01	
TH-227	#B	-1.8544E-01	-1.8544E-01	4.1319E-01	4.1332E-01	4.503E-01
PA-234	#B	3.7593E-02	3.7593E-02	2.1542E-01	2.1543E-01	2.397E-01
TH-234	#B	1.4661E+00	1.4661E+00	1.6903E+00	1.6922E+00	4.385E+00
AM-241	#A	-6.6322E-02	-6.6325E-02	5.6698E-01	5.6700E-01	6.329E-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) 1.6171354E+01 pCi/gm
Total Decayed Activity (295.2 to 1999.0 keV) 1.6171354E+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_14AUG2006_1020.An1

Sample description
FSS-OOL-10-04-007-F

Spectrum Filename: C:\GammaVision\Spectra\102F_14AUG2006_1020.An1

Acquisition information

Start time:	07-Aug-2006 10:20:47
Live time:	2000
Real time:	2023
Dead time:	1.15 %
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:	2.0950E+03
Activity scaling factor:	1.0000E+06/(1.0000E+00* 2.0950E+03) = 4.7733E+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	27-Jul-2006 10:00:00
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: 0.6255

***** 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	191.	24.44	1.50	9.541E-03	77.11	10.700	1.207E+00	PB214
					77.11	17.500	7.382E-01	PB212
77.31	191.	24.44	1.50	9.541E-03	77.11	10.700	1.207E+00	PB214
					77.11	17.500	7.382E-01	PB212
186.27	98.	34.69	1.56	1.625E-02	185.99	3.280	PBC<MDA	RA226
210.09	85.	31.58	1.28	1.515E-02				
239.03	583.	5.08	1.22	1.378E-02	238.63	43.100	6.318E-01	PB212
242.63	90.	22.13	1.22	1.362E-02	241.00	3.900	PBC<MDA	RA224
					241.92	7.470	5.701E-01	PB214
270.59	81.	30.27	1.53	1.241E-02				
295.57	200.	12.52	1.25	1.145E-02	295.22	19.200	5.866E-01	PB214
301.20	50.	36.46	1.11	1.125E-02				
338.85	166.	16.93	1.46	1.005E-02	338.40	12.010	8.841E-01	AC228
352.52	299.	9.19	1.20	9.664E-03	351.99	37.100	5.370E-01	PB214
463.66	58.	33.80	1.47	7.362E-03	463.51	10.000	4.964E-01	SB125
511.24	94.	16.15	1.63	6.688E-03	510.72	22.500	4.004E-01	TL208
583.81	205.	9.58	1.42	5.884E-03	583.14	86.000	2.608E-01	TL208
610.17	194.	10.48	1.42	5.642E-03	609.32	46.090	4.813E-01	BI214
728.11	52.	30.15	1.41	4.788E-03	727.17	11.800	5.975E-01	BI212
912.46	148.	14.04	1.84	3.917E-03	911.07	29.000	8.381E-01	AC228
969.75	68.	21.22	1.12	3.715E-03	968.90	17.460	6.704E-01	AC228
1462.77	642.	4.02	1.96	2.618E-03	1460.75	10.700	1.476E+01	K40
1767.25	27.	21.27	2.24	2.225E-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	
419.80	210.09	274.	85.	0.042	94.75	1.283	NP-239	s
477.68	239.08	146.	583.	0.291	15.23	1.215	PB-212	D
484.89	242.68	154.	90.	0.045	66.38	1.218	XE-138	D
540.82	270.59	200.	81.	0.041	90.80	1.529	AC-228	s
602.06	301.20	127.	50.	0.025	109.37	1.109	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-214	153.80	77.11	994.	191.	0.096	73.31	1.500D
PB-212	153.80	77.11	994.	191.	0.096	73.31	1.500D
RA-226	371.95	186.17	498.	83.	0.041	112.56	1.500s
PB-212	477.69	239.03	441.	504.	0.252	22.14	1.500
PB-214	591.06	295.70	174.	163.	0.082	41.53	1.500
AC-228	677.37	338.85	182.	166.	0.083	50.78	1.460s
PB-214	704.81	352.56	144.	281.	0.141	25.41	1.500
SB-125	927.52	463.88	84.	44.	0.022	95.74	1.500
TL-208	1022.27	511.24	58.	94.	0.047	48.45	1.626s
TL-208	1167.45	583.81	65.	205.	0.102	28.75	1.419s
BI-214	1220.19	610.17	67.	194.	0.097	31.43	1.422
BI-212	1456.18	728.11	62.	52.	0.026	90.44	1.414
AC-228	1825.05	912.46	63.	148.	0.074	42.11	1.845
AC-228	1939.71	969.75	48.	67.	0.034	63.67	1.117s
K-40	2926.51	1462.80	10.	617.	0.308	12.28	2.042
BI-214	3535.97	1767.25	3.	27.	0.013	63.81	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		1.0990E-01					
			477.56	1.099E-01	&(	3.430E-01 1.01E-01	G
K-40		1.4184E+01					
			1460.75	1.418E+01	(P	4.076E-01 5.81E-01	G
MN-54		1.5858E-02					
			834.81	1.586E-02	&(P	4.891E-02 1.44E-02	G
CO-57		-1.2568E-02					
			122.07	-1.257E-02	%(	5.668E-02 1.70E-02	G K
			136.43	-6.241E-02	%	4.538E-01 1.36E-01	G
CO-60		1.2412E-02					
			1332.51	1.241E-02	&(P	6.099E-02 1.74E-02	G K
			1173.23	1.755E-02	%	6.669E-02 1.95E-02	G K
Sr-85		-2.3134E-02					
			514.00	-2.313E-02	%(	6.470E-02 1.94E-02	G
Kr-85		-4.7482E+02					
			513.99	-4.748E+02	%(	1.328E+03 3.98E+02	G
Y-88		-5.9085E-03					
			1836.01	-5.908E-03	%(P	5.045E-02 1.34E-02	G K
			898.02	1.343E-02	% P	5.236E-02 1.51E-02	G
NB-94		0.0000E+00					
			871.10	0.000E+00	%(	5.352E-02 1.49E-02	G K
			702.50	1.599E-03	%	4.804E-02 1.36E-02	G K
Ag-108M		1.2815E-02					
			722.95	1.282E-02	&(	5.183E-02 1.52E-02	G K
			614.37	-1.396E-02	% P	5.742E-02 1.69E-02	G
			433.93	-6.529E-03	&	5.072E-02 1.48E-02	G
CD-109		1.3234E+00					
			88.04	1.323E+00	%(P	1.927E+00 5.89E-01	G
SN-113		1.6769E-02					
			391.71	1.677E-02	&(	5.016E-02 1.49E-02	G K
			255.04	-1.148E-01	%	1.913E+00 5.62E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	9.5576E-02						
		427.95	-2.754E-03	%(P	1.577E-01	4.54E-02	G K
		600.77	5.638E-02	% P	2.456E-01	7.19E-02	G
		636.15	-3.743E-02	% P	4.159E-01	1.19E-01	G
		463.51	3.866E-01	(P	4.000E-01	1.28E-01	G
		176.29	-1.769E-01	% P	6.383E-01	1.91E-01	G
I-131	-2.5379E-02						
		364.48	-2.538E-02	%(	1.186E-01	3.50E-02	G K
		636.97	4.408E-02	%	1.579E+00	4.46E-01	G
		284.29	5.662E-03	&	1.637E+00	4.78E-01	G
CS-134	-1.1570E-02						
		604.66	-1.157E-02	%(	5.164E-02	1.52E-02	G K
		795.76	3.944E-02	&	6.061E-02	1.89E-02	G
		569.29	2.063E-02	&	2.587E-01	7.37E-02	G
		801.84	1.447E-01	& P	5.044E-01	1.48E-01	G
CS-137	2.2620E-02						
		661.62	2.262E-02	%(	5.751E-02	1.72E-02	G
CE-139	4.6563E-03						
		165.85	4.656E-03	&(P	5.737E-02	1.71E-02	G
EU-152	-4.1248E-02						
		121.78	-4.125E-02	%(P	1.679E-01	5.04E-02	G K
		344.30	-3.844E-02	%	1.582E-01	4.70E-02	G
		1408.08	7.016E-03	%	2.637E-01	7.13E-02	G
		964.00	-2.474E-02	& P	3.719E-01	1.04E-01	G
		1112.07	2.639E-02	&	5.182E-01	1.47E-01	G
		778.90	5.944E-02	% P	3.343E-01	9.58E-02	G
EU-154	-2.8314E-02						
		123.10	-2.831E-02	%(P	1.103E-01	3.31E-02	G K
		1274.80	2.815E-02	&	1.939E-01	5.53E-02	G
		723.30	-1.112E-01	& P	3.249E-01	9.68E-02	G
		1004.80	-5.494E-02	%	3.242E-01	9.30E-02	G
EU-155	1.2132E-01						
		86.45	1.213E-01	&(P	2.348E-01	7.12E-02	G K
		105.31	1.904E-02	%	1.982E-01	5.89E-02	G
HG-203	7.5066E-04						
		279.17	7.507E-04	%(P	5.346E-02	1.56E-02	G K
		72.87	-2.884E-01	%	1.942E+00	5.81E-01	G
		70.83	1.243E+00	%	3.263E+00	9.85E-01	G
		82.50	-1.276E+00	%	4.395E+00	1.32E+00	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	2.6079E-01						
		583.14	2.608E-01	@(P	5.137E-02	2.51E-02	G
		510.72	4.004E-01	+	1.642E-01	6.47E-02	G
PB-212	5.4686E-01						
		238.63	5.469E-01	(	1.090E-01	4.04E-02	G K
							Energy duplication
		77.11	7.382E-01	+	5.782E-01	1.80E-01	G
		74.81	7.862E-01	& P	1.168E+00	3.56E-01	G
PB-214	4.9604E-01						
		351.99	5.050E-01	(P	1.053E-01	4.28E-02	G K
		295.22	4.787E-01	(	1.881E-01	6.63E-02	G
							Energy duplication
		77.11	1.207E+00	+	9.456E-01	2.95E-01	G
		241.92	-6.732E-03	%	6.463E-01	1.91E-01	G
BI-212	5.9749E-01						
		727.17	5.975E-01	(	4.479E-01	1.80E-01	G K
		1620.56	3.045E-01	& P	1.345E+00	3.66E-01	G
		785.42	5.648E-01	% P	2.220E+00	6.46E-01	G
BI-214	4.8387E-01						
		609.32	4.813E-01	(	1.010E-01	5.05E-02	G K
		1764.51	4.912E-01	?(P	1.992E-01	1.05E-01	G
		1120.28	-7.265E-02	&	5.304E-01	1.53E-01	G
RA-224	6.5785E-01						
		241.00	6.579E-01	%(P	1.271E+00	3.86E-01	G
RA-226	1.0025E+00						
		185.99	1.002E+00	(P	1.290E+00	3.96E-01	G
AC-228	7.9745E-01						
		911.07	8.381E-01	(P	2.255E-01	1.18E-01	G K
		968.90	6.704E-01	(P	3.462E-01	1.42E-01	G
		338.40	8.841E-01	@(	3.505E-01	1.50E-01	G
TH-227	-2.1706E-01						
		236.00	-2.171E-01	%(P	4.883E-01	1.48E-01	G K
		256.25	4.131E-03	&	5.309E-01	1.55E-01	G
PA-234	-2.3887E-02						
		98.44	-2.389E-02	&(	2.563E-01	7.66E-02	G K
		946.00	-4.382E-02	%	2.897E-01	8.32E-02	G
		131.28	0.000E+00	&	2.288E-01	6.79E-02	G
		94.67	2.704E-01	%	3.895E-01	1.19E-01	G
		883.24	-9.088E-02	%	4.652E-01	1.35E-01	G
		926.70	-2.666E-02	&	4.390E-01	1.22E-01	G

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 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26-1.787E-02 &   3.459E-01 9.75E-02 G

TH-234       1.1252E+00
                           63.29 1.125E+00 %(P 4.540E+00 1.36E+00 G K
                           92.80 1.470E+00 %   2.353E+00 7.18E-01 G
                           92.38-1.974E-01 & P 2.532E+00 7.54E-01 G

AM-241      -6.9199E-02
                           59.54-6.920E-02 &(  6.017E-01 1.79E-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	9.5257E-02	1.0990E-01	3.0428E-01	3.0434E-01	2.973E-01
K-40		1.4184E+01	1.4184E+01	1.7420E+00	1.9152E+00	4.076E-01
MN-54	#A	1.5475E-02	1.5858E-02	4.3273E-02	4.3282E-02	4.773E-02
CO-57	#B	-1.2218E-02	-1.2568E-02	5.0980E-02	5.0985E-02	5.510E-02
CO-60	#B	1.2363E-02	1.2412E-02	5.2346E-02	5.2351E-02	6.074E-02

Sr-85	#A	-2.0564E-02	-2.3134E-02	5.8193E-02	5.8208E-02	5.751E-02
Kr-85	#A	-4.7478E+02	-4.7482E+02	1.1943E+03	1.1946E+03	1.328E+03
Y-88	#B	-5.5001E-03	-5.9085E-03	4.0399E-02	4.0400E-02	4.696E-02
NB-94	#B	0.0000E+00	0.0000E+00	4.4827E-02	4.4827E-02	5.352E-02
Ag-108M	#B	1.2813E-02	1.2815E-02	4.5457E-02	4.5462E-02	5.182E-02
CD-109	#A	1.3013E+00	1.3234E+00	1.7667E+00	1.7682E+00	1.895E+00
SN-113	#B	1.5692E-02	1.6769E-02	4.4752E-02	4.4762E-02	4.694E-02
SB-125	#B	9.4858E-02	9.5576E-02	9.4736E-02	9.4887E-02	1.565E-01
I-131	#B	-9.8191E-03	-2.5379E-02	1.0499E-01	1.0500E-01	4.589E-02
CS-134	#B	-1.1454E-02	-1.1570E-02	4.5487E-02	4.5492E-02	5.112E-02
CS-137	#A	2.2604E-02	2.2620E-02	5.1717E-02	5.1732E-02	5.747E-02
CE-139	#A	4.4048E-03	4.6563E-03	5.1195E-02	5.1196E-02	5.427E-02
EU-152	#B	-4.1180E-02	-4.1248E-02	1.5977E-01	1.5978E-01	1.676E-01
EU-154	#B	-2.8244E-02	-2.8314E-02	1.0069E-01	1.0071E-01	1.101E-01
EU-155	#B	1.2081E-01	1.2132E-01	2.1374E-01	2.1385E-01	2.338E-01
HG-203	#B	6.3720E-04	7.5066E-04	4.6818E-02	4.6818E-02	4.538E-02
TL-208	#	2.6079E-01	2.6079E-01	7.5119E-02	7.6531E-02	
PB-212	#	5.4686E-01	5.4686E-01	1.2106E-01	1.2489E-01	1.090E-01
PB-214	#	4.9604E-01	4.9604E-01	1.2080E-01	1.2397E-01	1.053E-01
BI-212		5.9749E-01	5.9749E-01	5.4035E-01	5.4139E-01	
BI-214		4.8387E-01	4.8387E-01	1.5209E-01	1.5449E-01	
RA-224	#A	6.5785E-01	6.5785E-01	1.1576E+00	1.1581E+00	1.271E+00
RA-226	#A	1.0025E+00	1.0025E+00	1.1891E+00	1.1904E+00	1.290E+00
AC-228		7.9745E-01	7.9745E-01	2.4385E-01	2.4793E-01	
TH-227	#B	-2.1706E-01	-2.1706E-01	4.4828E-01	4.4844E-01	4.883E-01
PA-234	#B	-2.3887E-02	-2.3887E-02	2.2976E-01	2.2976E-01	2.563E-01
TH-234	#B	1.1252E+00	1.1252E+00	4.0909E+00	4.0914E+00	4.540E+00
AM-241	#A	-6.9196E-02	-6.9199E-02	5.3817E-01	5.3818E-01	6.017E-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) 1.6323738E+01 pCi/gm
Total Decayed Activity (270.2 to 1999.0 keV) 1.6323738E+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_14AUG2006_1100.An1

Sample description
FSS-OOL-10-04-007-F-RC

Spectrum Filename: C:\GammaVision\Spectra\102F_14AUG2006_1100.An1

Acquisition information
Start time: 07-Aug-2006 11:00:24
Live time: 2000
Real time: 2023
Dead time: 1.16 %
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: 2.0950E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 2.0950E+03) =
4.7733E+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	27-Jul-2006 10:00:00
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. 13 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.6352

***** 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	201.	22.51	1.50	9.541E-03	77.11	10.700	1.267E+00	PB214
					77.11	17.500	7.750E-01	PB212
77.16	201.	22.51	1.50	9.541E-03	77.11	10.700	1.267E+00	PB214
					77.11	17.500	7.750E-01	PB212
93.36	143.	31.41	1.50	1.333E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	2.305E+00	TH234
209.30	99.	36.49	1.24	1.519E-02				
239.03	565.	5.16	1.22	1.379E-02	238.63	43.100	6.130E-01	PB212
241.72	98.	26.11	1.22	1.366E-02	241.00	3.900	PBC<MDA	RA224
					241.92	7.470	6.187E-01	PB214
271.38	84.	31.06	1.07	1.238E-02				
295.57	164.	15.08	1.42	1.145E-02	295.22	19.200	4.811E-01	PB214
338.92	104.	24.06	1.38	1.004E-02	338.40	12.010	5.552E-01	AC228
352.46	307.	10.38	1.42	9.666E-03	351.99	37.100	5.513E-01	PB214
463.62	39.	30.36	0.82	7.363E-03	463.51	10.000	PBC<MDA	SB125
511.44	86.	22.95	1.34	6.686E-03	510.72	22.500	3.683E-01	TL208
584.08	208.	10.73	1.76	5.881E-03	583.14	86.000	2.638E-01	TL208
610.18	198.	10.07	1.49	5.642E-03	609.32	46.090	4.895E-01	BI214
662.89	49.	31.20	1.12	5.220E-03	661.62	84.620	7.118E-02	CS137
912.69	134.	11.39	1.32	3.916E-03	911.07	29.000	7.558E-01	AC228
970.11	102.	14.64	1.94	3.714E-03	968.90	17.460	1.015E+00	AC228
1463.00	629.	4.09	1.79	2.617E-03	1460.75	10.700	1.446E+01	K40
1767.24	25.	23.53	2.24	2.225E-03	1764.51	15.920	4.492E-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	
418.23	209.30	414.	99.	0.049	109.48	1.242	AC-228	
477.69	239.01	143.	565.	0.283	15.49	1.215	PB-212	D
483.07	241.70	277.	98.	0.049	78.32	1.217	PB-214	D
542.40	271.38	219.	84.	0.042	93.18	1.070	PA-234	s
1941.27	970.11	30.	59.	0.030	55.33	1.719	AC-228	D
2244.84	1122.22	46.	60.	0.030	72.29	1.751	TA-182	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	153.80	77.11	919.	201.	0.100	67.52	1.500D
PB-212	153.80	77.11	919.	201.	0.100	67.52	1.500D
TH-234	186.29	93.36	936.	143.	0.071	94.22	1.500s
PB-212	477.72	239.04	378.	516.	0.258	20.74	1.500
PB-214	483.38	241.87	443.	77.	0.039	120.47	1.500
PB-214	590.77	295.56	191.	154.	0.077	45.08	1.500
AC-228	677.51	338.92	174.	104.	0.052	72.17	1.381
PB-214	704.69	352.51	152.	259.	0.130	27.40	1.500s
SB-125	927.04	463.64	63.	44.	0.022	86.15	1.500s
TL-208	1022.66	511.44	92.	86.	0.043	68.85	1.343s
TL-208	1168.00	584.08	88.	207.	0.104	32.18	1.764s
BI-214	1220.21	610.18	68.	198.	0.099	30.21	1.492
Ag-108M	1224.62	612.38	169.	-53.	-0.026	112.39	1.499s
CS-137	1325.68	662.89	57.	49.	0.024	93.60	1.118
AC-228	1825.52	912.69	32.	133.	0.067	34.17	1.319s
AC-228	1938.01	968.90	28.	63.	0.032	51.58	1.718D
K-40	2926.94	1463.02	8.	612.	0.306	12.28	2.042
BI-214	3535.95	1767.24	5.	25.	0.012	70.59	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		-1.2900E-01					
			477.56	-1.290E-01	%(	5.088E-01 1.51E-01	G
K-40		1.4080E+01					
			1460.75	1.408E+01	(P	3.660E-01 5.76E-01	G
MN-54		2.8083E-03					
			834.81	2.808E-03	&(P	4.309E-02 1.20E-02	G
CO-57		-9.2345E-03					
			122.07	-9.234E-03	%(	5.793E-02 1.73E-02	G K
			136.43	-1.884E-02	&	4.190E-01 1.24E-01	G
CO-60		8.6611E-03					
			1332.51	8.661E-03	%(P	5.371E-02 1.51E-02	G K
			1173.23	1.877E-02	%	5.764E-02 1.70E-02	G K
Sr-85		-1.7968E-02					
			514.00	-1.797E-02	&(	6.236E-02 1.86E-02	G
Kr-85		-3.6864E+02					
			513.99	-3.686E+02	&(	1.279E+03 3.81E+02	G
Y-88		-2.1308E-05					
			1836.01	-2.131E-05	&(P	2.393E-02 3.25E-03	G K
			898.02	-1.631E-03	% P	4.946E-02 1.34E-02	G
NB-94		-7.5587E-04					
			871.10	-7.559E-04	%(	4.654E-02 1.29E-02	G K
			702.50	1.485E-02	%	4.989E-02 1.47E-02	G K
Ag-108M		1.1037E-02					
			722.95	1.104E-02	&(	3.683E-02 1.07E-02	G K
			614.37	-6.747E-02	+ P	8.068E-02 2.52E-02	G
			433.93	-4.983E-03	&	4.826E-02 1.41E-02	G
CD-109		1.2161E+00					
			88.04	1.216E+00	%(P	1.980E+00 6.04E-01	G
SN-113		-2.6325E-03					
			391.71	-2.632E-03	%(	6.182E-02 1.78E-02	G K
			255.04	-3.212E-01	&	2.089E+00 6.20E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	1.1734E-01						
		427.95	2.659E-02	%(P	1.421E-01	4.17E-02	G K
		600.77	4.696E-03	% P	1.796E-01	4.97E-02	G
		636.15	-6.209E-02	% P	3.791E-01	1.09E-01	G
		463.51	3.860E-01	(P	3.515E-01	1.15E-01	G
		176.29	-8.885E-02	& P	6.445E-01	1.91E-01	G
I-131	-1.3837E-02						
		364.48	-1.384E-02	%(	1.278E-01	3.74E-02	G K
		636.97	0.000E+00	%	1.747E+00	4.95E-01	G
		284.29	-4.085E-02	&	1.652E+00	4.83E-01	G
CS-134	-7.1941E-03						
		604.66	-7.194E-03	%(	4.850E-02	1.41E-02	G K
		795.76	3.679E-02	%	4.890E-02	1.56E-02	G
		569.29	1.368E-01	&	1.835E-01	5.87E-02	G
		801.84	-5.665E-02	% P	5.467E-01	1.55E-01	G
CS-137	7.1183E-02						
		661.62	7.118E-02	(	5.536E-02	2.22E-02	G
CE-139	-1.1608E-03						
		165.85	-1.161E-03	%(P	5.593E-02	1.66E-02	G
EU-152	-3.6123E-02						
		121.78	-3.612E-02	&(P	1.729E-01	5.18E-02	G K
		344.30	1.685E-02	&	1.477E-01	4.33E-02	G
		1408.08	1.223E-03	&	2.278E-01	6.00E-02	G
		964.00	-5.608E-02	% P	3.995E-01	1.14E-01	G
		1112.07	0.000E+00	%	5.934E-01	1.68E-01	G
		778.90	-2.291E-02	% P	3.700E-01	1.04E-01	G
EU-154	-1.2083E-02						
		123.10	-1.208E-02	&(P	1.151E-01	3.43E-02	G K
		1274.80	5.966E-03	%	1.409E-01	3.82E-02	G
		723.30	-1.874E-03	& P	1.870E-01	5.10E-02	G
		1004.80	0.000E+00	%	3.049E-01	8.42E-02	G
EU-155	1.3706E-01						
		86.45	1.371E-01	&(P	2.371E-01	7.21E-02	G K
		105.31	1.742E-02	&	2.361E-01	7.03E-02	G
HG-203	1.5735E-03						
		279.17	1.574E-03	%(P	5.763E-02	1.69E-02	G K
		72.87	-6.083E-01	%	2.100E+00	6.32E-01	G
		70.83	1.872E+00	&	3.258E+00	9.92E-01	G
		82.50	-1.391E+00	%	4.406E+00	1.33E+00	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	2.6384E-01						
		583.14	2.638E-01	(P	5.906E-02	2.84E-02	G
		510.72	3.683E-01	+	2.030E-01	8.46E-02	G
PB-212	5.5932E-01						
		238.63	5.593E-01	(	1.012E-01	3.87E-02	G K
							Energy duplication
		77.11	7.750E-01	+	5.562E-01	1.74E-01	G
		74.81	8.009E-01	& P	1.128E+00	3.45E-01	G
PB-214	4.6433E-01						
		351.99	4.661E-01	@(P	1.081E-01	4.26E-02	G K
		295.22	4.516E-01	(	1.967E-01	6.78E-02	G
							Energy duplication
		77.11	1.267E+00	+	9.096E-01	2.85E-01	G
		241.92	4.886E-01	(	6.372E-01	1.96E-01	G
BI-212	3.0243E-01						
		727.17	3.024E-01	%(	4.115E-01	1.30E-01	G K
		1620.56	2.753E-01	% P	1.870E+00	5.11E-01	G
		785.42	-2.565E-03	% P	3.014E+00	8.55E-01	G
BI-214	4.7917E-01						
		609.32	4.895E-01	(	1.022E-01	4.94E-02	G K
		1764.51	4.492E-01	?(P	2.328E-01	1.06E-01	G
		1120.28	-3.566E-02	&	5.172E-01	1.48E-01	G
RA-224	4.8189E-01						
		241.00	4.819E-01	&(P	1.203E+00	3.63E-01	G
RA-226	7.7690E-01						
		185.99	7.769E-01	%(P	1.311E+00	3.99E-01	G
AC-228	7.0842E-01						
		911.07	7.558E-01	@(P	1.642E-01	8.63E-02	G K
		968.90	6.297E-01	(P	2.709E-01	1.08E-01	G
		338.40	5.552E-01	-	3.426E-01	1.34E-01	G
TH-227	1.2027E-02						
		236.00	1.203E-02	%(P	5.159E-01	1.53E-01	G K
		256.25	1.688E-01	&	5.810E-01	1.74E-01	G
PA-234	-5.8042E-02						
		98.44	-5.804E-02	&(	2.536E-01	7.62E-02	G K
		946.00	0.000E+00	%	3.649E-01	1.04E-01	G
		131.28	-2.466E-02	%	2.215E-01	6.60E-02	G
		94.67	-5.425E-02	%	4.590E-01	1.37E-01	G
		883.24	0.000E+00	%	4.792E-01	1.34E-01	G
		926.70	-7.159E-02	%	4.996E-01	1.43E-01	G

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 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26 2.018E-01 &   2.692E-01 8.62E-02 G

TH-234       1.5817E+00
                           63.29 1.026E+00 %(P 4.360E+00 1.31E+00 G K
                           92.80 2.305E+00  (  2.343E+00 7.24E-01 G
                           92.38-3.045E-01 & P 2.974E+00 8.89E-01 G

AM-241      -1.7927E-02
                           59.54-1.793E-02 &(  6.610E-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	-1.1177E-01	-1.2900E-01	4.5151E-01	4.5156E-01	4.409E-01
K-40		1.4080E+01	1.4080E+01	1.7293E+00	1.9013E+00	3.660E-01
MN-54	#A	2.7403E-03	2.8083E-03	3.5868E-02	3.5868E-02	4.205E-02
CO-57	#B	-8.9764E-03	-9.2345E-03	5.1974E-02	5.1976E-02	5.631E-02
CO-60	#B	8.6268E-03	8.6611E-03	4.5229E-02	4.5231E-02	5.349E-02

Sr-85	#A	-1.5967E-02	-1.7968E-02	5.5682E-02	5.5691E-02	5.542E-02
Kr-85	#A	-3.6861E+02	-3.6864E+02	1.1424E+03	1.1426E+03	1.279E+03
Y-88	#B	-1.9832E-05	-2.1308E-05	1.2785E-04	1.2786E-04	2.227E-02
NB-94	#B	-7.5587E-04	-7.5587E-04	3.8611E-02	3.8611E-02	4.654E-02
Ag-108M	#B	1.1035E-02	1.1037E-02	3.2250E-02	3.2256E-02	3.683E-02
CD-109	#A	1.1957E+00	1.2161E+00	1.8106E+00	1.8118E+00	1.947E+00
SN-113	#B	-2.4631E-03	-2.6325E-03	5.3516E-02	5.3516E-02	5.785E-02
SB-125	#B	1.1646E-01	1.1734E-01	1.0467E-01	1.0488E-01	1.411E-01
I-131	#B	-5.3407E-03	-1.3837E-02	1.1220E-01	1.1220E-01	4.935E-02
CS-134	#B	-7.1214E-03	-7.1941E-03	4.2171E-02	4.2173E-02	4.801E-02
CS-137		7.1133E-02	7.1183E-02	6.6630E-02	6.6750E-02	
CE-139	#A	-1.0980E-03	-1.1608E-03	7.2818E-02	7.2818E-02	5.290E-02
EU-152	#B	-3.6063E-02	-3.6123E-02	1.6562E-01	1.6563E-01	1.726E-01
EU-154	#B	-1.2053E-02	-1.2083E-02	1.0631E-01	1.0631E-01	1.148E-01
EU-155	#B	1.3648E-01	1.3706E-01	2.1633E-01	2.1646E-01	2.361E-01
HG-203	#B	1.3352E-03	1.5735E-03	5.0668E-02	5.0668E-02	4.890E-02
TL-208		2.6384E-01	2.6384E-01	8.5083E-02	8.6362E-02	
PB-212	#	5.5932E-01	5.5932E-01	1.1599E-01	1.2016E-01	1.012E-01
PB-214	#	4.6433E-01	4.6433E-01	1.2740E-01	1.3004E-01	1.081E-01
BI-212	#B	3.0243E-01	3.0243E-01	3.8874E-01	3.8911E-01	4.115E-01
BI-214		4.7917E-01	4.7917E-01	1.4476E-01	1.4724E-01	
RA-224	#A	4.8189E-01	4.8189E-01	1.0891E+00	1.0894E+00	1.203E+00
RA-226	#A	7.7689E-01	7.7690E-01	1.1975E+00	1.1983E+00	1.311E+00
AC-228		7.0842E-01	7.0842E-01	2.1936E-01	2.2293E-01	
TH-227	#B	1.2027E-02	1.2027E-02	4.5996E-01	4.5996E-01	5.159E-01
PA-234	#B	-5.8042E-02	-5.8042E-02	2.2854E-01	2.2856E-01	2.536E-01
TH-234	#B	1.5817E+00	1.5817E+00	1.4902E+00	1.4928E+00	4.360E+00
AM-241	#A	-1.7926E-02	-1.7927E-02	5.8984E-01	5.8984E-01	6.610E-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) 1.5602223E+01 pCi/gm
Total Decayed Activity (1119.8 to 1999.0 keV) 1.5602273E+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_27JUL2006_1728.An1

Sample description
FSS-OOL-10-04-008-F-S WET

Spectrum Filename: C:\GammaVision\Spectra\102F_27JUL2006_1728.An1

Acquisition information
Start time: 27-Jul-2006 17:28:18
Live time: 2000
Real time: 2019
Dead time: 0.95 %
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: 2.0850E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 2.0850E+03) =
4.7962E+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	27-Jul-2006 08:46:00
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: 0.6052

***** 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	185.	24.29	1.50	9.541E-03	77.11	10.700	1.172E+00	PB214
					77.11	17.500	7.167E-01	PB212
77.20	185.	24.29	1.50	9.541E-03	77.11	10.700	1.172E+00	PB214
					77.11	17.500	7.167E-01	PB212
186.10	117.	29.48	1.03	1.626E-02	185.99	3.280	1.365E+00	RA226
239.09	616.	4.81	1.22	1.379E-02	238.63	43.100	6.707E-01	PB212
242.36	93.	22.95	1.22	1.364E-02	241.00	3.900	PBC<MDA	RA224
					241.92	7.470	5.907E-01	PB214
271.04	62.	31.19	1.40	1.240E-02				
295.42	169.	16.27	1.32	1.146E-02	295.22	19.200	4.964E-01	PB214
300.84	42.	37.34	1.14	1.126E-02				
338.82	135.	17.92	1.22	1.005E-02	338.40	12.010	7.242E-01	AC228
352.64	247.	11.29	1.18	9.661E-03	351.99	37.100	4.451E-01	PB214
511.64	91.	20.18	1.45	6.683E-03	510.72	22.500	3.924E-01	TL208
					513.99	0.004	2.066E+03	Kr85
					514.00	99.270	8.985E-02	Sr85
584.16	200.	12.95	1.65	5.880E-03	583.14	86.000	2.554E-01	TL208
610.35	215.	11.06	1.22	5.640E-03	609.32	46.090	5.347E-01	BI214
912.65	119.	11.36	1.86	3.916E-03	911.07	29.000	6.780E-01	AC228
970.26	106.	16.59	2.03	3.713E-03	968.90	17.460	1.056E+00	AC228
1121.60	50.	26.27	1.54	3.283E-03	1120.28	15.040	6.563E-01	BI214
1463.23	560.	4.38	2.06	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	
477.81	239.02	130.	616.	0.308	14.43	1.215	PB-212	D
484.35	242.28	181.	93.	0.046	68.85	1.217	XE-138	D
541.72	271.04	143.	62.	0.031	93.57	1.401	AC-228	sM
601.33	300.84	102.	42.	0.021	112.03	1.144	PB-212	M
1457.91	728.98	46.	51.	0.025	83.77	1.100	J-132	l
1940.73	970.26	48.	111.	0.055	38.97	2.034	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	913.	185.	0.092	72.86	1.500D
PB-212	153.80	77.11	913.	185.	0.092	72.86	1.500D
RA-226	372.08	186.23	455.	92.	0.046	98.44	1.500
PB-212	477.83	239.10	405.	536.	0.268	20.53	1.500s
RA-224	483.07	241.72	410.	83.	0.042	106.42	1.500s
PB-214	483.24	241.81	420.	77.	0.038	118.26	1.500s
PB-214	591.19	295.77	197.	149.	0.075	46.90	1.500s
AC-228	677.40	338.86	118.	131.	0.065	44.03	1.500
PB-214	704.91	352.61	120.	216.	0.108	29.62	1.500
TL-208	1023.06	511.64	80.	91.	0.046	60.53	1.449s
TL-208	1168.15	584.16	112.	200.	0.100	38.84	1.646
BI-214	1220.47	610.31	70.	192.	0.096	32.30	1.208s
AC-228	1825.76	912.81	23.	114.	0.057	33.24	1.679
BI-214	2243.59	1121.60	35.	50.	0.025	78.80	1.540s
K-40	2927.43	1463.26	21.	522.	0.261	13.65	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		7.7810E-02					
			477.56	7.781E-02	%(	3.886E-01 1.14E-01	G
K-40		1.2062E+01					
			1460.75	1.206E+01	(P	5.611E-01 5.49E-01	G
MN-54		-9.8143E-03					
			834.81	-9.814E-03	%(P	5.622E-02 1.62E-02	G
CO-57		3.6830E-03					
			122.07	3.683E-03	%(	5.017E-02 1.49E-02	G K
			136.43	1.697E-02	%	4.175E-01 1.24E-01	G
CO-60		-1.5124E-03					
			1332.51	-1.512E-03	&(P	5.376E-02 1.45E-02	G K
			1173.23	-1.364E-02	&	6.934E-02 2.01E-02	G K
Sr-85		3.7182E-04					
			514.00	3.718E-04	%(	4.546E-02 1.30E-02	G
Kr-85		-5.8477E-01					
			513.99	-5.848E-01	%(	1.047E+03 2.99E+02	G
Y-88		-4.6324E-03					
			1836.01	-4.632E-03	%(P	5.172E-02 1.37E-02	G K
			898.02	-5.498E-04	% P	4.979E-02 1.36E-02	G
NB-94		1.3900E-02					
			871.10	1.390E-02	%(	4.526E-02 1.33E-02	G K
			702.50	6.962E-03	%	4.775E-02 1.38E-02	G K
Ag-108M		1.7022E-02					
			722.95	1.702E-02	&(	4.009E-02 1.20E-02	G K
			614.37	-4.112E-02	& P	6.911E-02 2.12E-02	G
			433.93	-3.618E-03	&	4.620E-02 1.34E-02	G
CD-109		6.7927E-02					
			88.04	6.793E-02	%(P	2.073E+00 6.18E-01	G
SN-113		8.4745E-03					
			391.71	8.474E-03	%(	6.058E-02 1.77E-02	G K
			255.04	-2.293E-01	%	1.751E+00 5.17E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	6.4375E-02						
		427.95	6.438E-02	%(P	1.363E-01	4.12E-02	G K
		600.77	2.709E-02	& P	1.548E-01	4.38E-02	G
		636.15	-2.915E-03	% P	3.546E-01	9.89E-02	G
		463.51	2.442E-01	% P	4.067E-01	1.25E-01	G
		176.29	-1.738E-01	% P	5.946E-01	1.78E-01	G
I-131	-5.3805E-03						
		364.48	-5.380E-03	%(	5.195E-02	1.52E-02	G K
		636.97	5.022E-02	&	5.530E-01	1.57E-01	G
		284.29	7.311E-02	%	5.944E-01	1.75E-01	G
CS-134	9.2297E-03						
		604.66	9.230E-03	%(	4.358E-02	1.27E-02	G K
		795.76	1.919E-02	%	4.957E-02	1.48E-02	G
		569.29	-3.368E-02	%	2.547E-01	7.32E-02	G
		801.84	7.168E-02	% P	4.881E-01	1.39E-01	G
CS-137	0.0000E+00						
		661.62	0.000E+00	&(	5.811E-02	1.64E-02	G
CE-139	-9.3415E-04						
		165.85	-9.341E-04	%(P	5.119E-02	1.51E-02	G
EU-152	1.0203E-02						
		121.78	1.020E-02	&(P	1.555E-01	4.62E-02	G K
		344.30	1.505E-03	%	1.320E-01	3.81E-02	G
		1408.08	1.133E-05	%	2.287E-01	6.01E-02	G
		964.00	2.186E-02	& P	3.528E-01	9.84E-02	G
		1112.07	1.950E-01	%	4.147E-01	1.26E-01	G
		778.90	1.300E-01	& P	3.273E-01	9.78E-02	G
EU-154	-1.9493E-04						
		123.10	-1.949E-04	%(P	1.081E-01	3.20E-02	G K
		1274.80	-1.182E-02	&	1.622E-01	4.49E-02	G
		723.30	-2.321E-02	& P	2.220E-01	6.28E-02	G
		1004.80	5.111E-02	%	2.430E-01	6.92E-02	G
EU-155	-6.9834E-03						
		86.45	-6.983E-03	&(P	2.140E-01	6.34E-02	G K
		105.31	2.389E-02	%	2.307E-01	6.87E-02	G
HG-203	3.5824E-04						
		279.17	3.582E-04	&(P	4.296E-02	1.25E-02	G K
		72.87	1.710E-01	&	1.318E+00	3.92E-01	G
		70.83	-2.703E-01	%	3.426E+00	1.02E+00	G
		82.50	-1.216E+00	%	3.902E+00	1.18E+00	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	2.5539E-01						
		583.14	2.554E-01	(P	6.668E-02	3.32E-02	G
		510.72	3.924E-01	+	1.908E-01	7.93E-02	G
PB-212	5.8385E-01						
		238.63	5.839E-01	@(	1.051E-01	4.00E-02	G K
							Energy duplication
		77.11	7.167E-01	+	5.571E-01	1.74E-01	G
		74.81	6.958E-01	& P	1.163E+00	3.54E-01	G
PB-214	4.1599E-01						
		351.99	3.894E-01	(P	9.702E-02	3.85E-02	G K
		295.22	4.392E-01	@(	2.007E-01	6.87E-02	G
							Energy duplication
		77.11	1.172E+00	+	9.111E-01	2.85E-01	G
		241.92	4.883E-01	(	6.244E-01	1.93E-01	G
BI-212	-4.4910E-02						
		727.17	-4.491E-02	&(	3.527E-01	1.00E-01	G K
		1620.56	-3.299E-02	% P	7.246E-01	9.83E-02	G
		785.42	-4.683E-01	% P	2.211E+00	6.38E-01	G
BI-214	4.7892E-01						
		609.32	4.789E-01	@(	1.035E-01	5.16E-02	G K
		1764.51	-5.680E-03	& P	3.528E-01	9.21E-02	G
		1120.28	6.563E-01	+	3.974E-01	1.73E-01	G
RA-224	1.0131E+00						
		241.00	1.013E+00	(P	1.177E+00	3.64E-01	G
RA-226	1.1149E+00						
		185.99	1.115E+00	(P	1.240E+00	3.84E-01	G
AC-228	6.6458E-01						
		911.07	6.496E-01	(P	1.434E-01	7.21E-02	G K
		968.90	-5.042E-02	% P	4.049E-01	1.17E-01	G
		338.40	7.008E-01	(	2.866E-01	1.03E-01	G
TH-227	4.6573E-02						
		236.00	4.657E-02	%(P	3.106E-01	9.19E-02	G K
		256.25	-1.157E-01	%	5.263E-01	1.56E-01	G
PA-234	2.9746E-02						
		98.44	2.975E-02	&(	2.241E-01	6.69E-02	G K
		946.00	7.515E-03	&	2.502E-01	6.94E-02	G
		131.28	-1.871E-02	&	2.252E-01	6.70E-02	G
		94.67	-2.147E-01	%	4.448E-01	1.35E-01	G
		883.24	1.073E-01	%	3.697E-01	1.08E-01	G
		926.70	-4.984E-02	%	4.358E-01	1.23E-01	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26-5.653E-02 %   3.814E-01 1.10E-01 G

TH-234      -2.2345E-02
                           63.29-2.234E-02 %(P 3.723E+00 1.10E+00 G K
                           92.80 1.385E+00 %   2.238E+00 6.82E-01 G
                           92.38-1.340E-02 % P 2.430E+00 7.21E-01 G

AM-241       2.2799E-01
                           59.54 2.280E-01 %(  5.735E-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	

- -

***** 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	7.7444E-02	7.7810E-02	3.4120E-01	3.4122E-01	3.868E-01
K-40		1.2062E+01	1.2062E+01	1.6475E+00	1.7811E+00	5.611E-01
MN-54	#A	-9.8064E-03	-9.8143E-03	5.2028E-02	5.2031E-02	5.618E-02
CO-57	#B	3.6796E-03	3.6830E-03	4.4733E-02	4.4734E-02	5.012E-02
CO-60	#B	-1.5122E-03	-1.5124E-03	5.5140E-02	5.5140E-02	5.375E-02

Sr-85	#A	3.7038E-04	3.7182E-04	3.9004E-02	3.9004E-02	4.529E-02
Kr-85	#A	-5.8477E-01	-5.8477E-01	8.9717E+02	8.9717E+02	1.047E+03
Y-88	#B	-4.6215E-03	-4.6324E-03	4.1491E-02	4.1491E-02	5.160E-02
NB-94	#B	1.3900E-02	1.3900E-02	3.9862E-02	3.9870E-02	4.526E-02
Ag-108M	#B	1.7022E-02	1.7022E-02	3.6133E-02	3.6145E-02	4.009E-02
CD-109	#A	6.7889E-02	6.7927E-02	1.8543E+00	1.8543E+00	2.071E+00
SN-113	#B	8.4560E-03	8.4745E-03	5.3126E-02	5.3128E-02	6.045E-02
SB-125	#B	6.4359E-02	6.4375E-02	1.2368E-01	1.2373E-01	1.363E-01
I-131	#B	-5.2148E-03	-5.3805E-03	4.5594E-02	4.5595E-02	5.035E-02
CS-134	#B	9.2266E-03	9.2297E-03	3.8091E-02	3.8094E-02	4.356E-02
CS-137	#A	0.0000E+00	0.0000E+00	4.9288E-02	4.9288E-02	5.810E-02
CE-139	#A	-9.3244E-04	-9.3415E-04	7.1550E-02	7.1550E-02	5.109E-02
EU-152	#B	1.0203E-02	1.0203E-02	1.3868E-01	1.3868E-01	1.555E-01
EU-154	#B	-1.9492E-04	-1.9493E-04	3.9479E-02	3.9479E-02	1.081E-01
EU-155	#B	-6.9824E-03	-6.9834E-03	3.7180E+00	3.7180E+00	2.140E-01
HG-203	#B	3.5631E-04	3.5824E-04	3.7502E-02	3.7502E-02	4.273E-02
TL-208		2.5539E-01	2.5539E-01	9.9389E-02	1.0042E-01	
PB-212	#	5.8385E-01	5.8385E-01	1.1985E-01	1.2425E-01	1.051E-01
PB-214	#	4.1599E-01	4.1599E-01	1.2342E-01	1.2561E-01	9.702E-02
BI-212	#B	-4.4910E-02	-4.4910E-02	3.0065E-01	3.0066E-01	3.527E-01
BI-214	#	4.7892E-01	4.7892E-01	1.5468E-01	1.5700E-01	
RA-224	#A	1.0131E+00	1.0131E+00	1.0932E+00	1.0946E+00	1.177E+00
RA-226	#A	1.1149E+00	1.1149E+00	1.1508E+00	1.1525E+00	1.240E+00
AC-228		6.6458E-01	6.6458E-01	1.8345E-01	1.8721E-01	1.434E-01
TH-227	#B	4.6573E-02	4.6573E-02	2.7559E-01	2.7560E-01	3.106E-01
PA-234	#B	2.9746E-02	2.9746E-02	2.0079E-01	2.0079E-01	2.241E-01
TH-234	#B	-2.2345E-02	-2.2345E-02	1.0177E+01	1.0177E+01	3.723E+00
AM-241	#A	2.2799E-01	2.2799E-01	5.1969E-01	5.1984E-01	5.735E-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) 1.3460802E+01 pCi/gm
Total Decayed Activity (270.7 to 1999.0 keV) 1.3460802E+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_31JULY2006_1647.An1

Sample description
OOL-10-04-023-F

Spectrum Filename: C:\GammaVision\Spectra\102F_31JULY2006_1647.An1

Acquisition information
Start time: 31-Jul-2006 16:48:29
Live time: 2000
Real time: 2020
Dead time: 1.01 %
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: 1.9550E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.9550E+03) =
5.1151E+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	27-Jul-2006 08:16:00
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: 0.6602

***** 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	129.	24.56	1.10	8.959E-03	74.81	9.600	PBC<MDA	PB212
77.29	225.	13.93	1.10	9.694E-03	77.11	10.700	1.525E+00	PB214
					77.11	17.500	9.326E-01	PB212
185.98	118.	26.90	1.44	1.627E-02				
185.98	118.	26.90	1.44	1.627E-02	185.99	3.280	1.465E+00	RA226
239.10	638.	4.76	1.22	1.379E-02	238.63	43.100	7.411E-01	PB212
242.25	79.	25.62	1.22	1.364E-02	241.00	3.900	PBC<MDA	RA224
					241.92	7.470	5.361E-01	PB214
278.60	77.	31.98	1.24	1.209E-02				
278.60	77.	31.98	1.24	1.209E-02	279.17	81.500	5.766E-02	HG203
295.76	143.	12.38	1.26	1.145E-02	295.22	19.200	4.477E-01	PB214
300.75	44.	32.68	1.26	1.127E-02				
338.80	137.	16.66	1.30	1.005E-02	338.40	12.010	7.849E-01	AC228
352.58	249.	9.36	1.49	9.663E-03	351.99	37.100	4.786E-01	PB214
463.71	66.	29.29	1.48	7.362E-03	463.51	10.000	6.086E-01	SB125
511.72	100.	18.76	1.42	6.682E-03	510.72	22.500	4.589E-01	TL208
584.32	202.	10.26	1.35	5.879E-03	583.14	86.000	2.751E-01	TL208
610.30	168.	13.41	1.14	5.641E-03	609.32	46.090	4.460E-01	BI214
727.97	30.	36.55	1.44	4.794E-03	727.17	11.800	PBC<MDA	BI212
796.46	30.	33.82	1.60	4.420E-03	795.76	85.400	PBC<MDA	CS134
912.76	147.	13.08	1.78	3.916E-03				
969.58	117.	12.97	1.59	3.716E-03	968.90	17.460	1.243E+00	AC228
1121.85	52.	24.93	1.60	3.279E-03				
1463.27	509.	4.60	1.94	2.617E-03	1460.75	10.700	1.255E+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	
149.23	75.17	434.	129.	0.064	73.67	1.098	PB-214	D

Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM	Suspected	
154.15	77.63	380.	225.	0.113	41.79	1.100	PB-214	D
477.84	239.04	143.	638.	0.319	14.29	1.215	PB-212	D
484.13	242.18	166.	79.	0.040	76.87	1.217	PB-214	D
556.84	278.60	189.	77.	0.038	95.93	1.243	SB-126	l
601.16	300.66	80.	44.	0.022	98.03	1.259	PB-212	lD
927.16	463.71	97.	66.	0.033	87.87	1.477	SB-125	l
1825.65	912.76	60.	146.	0.073	33.52	1.782	AC-228	M
2244.09	1121.85	37.	53.	0.027	63.70	1.602	TA-182	

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	869.	213.	0.106	62.24	1.500D
PB-212	153.80	77.11	869.	213.	0.106	62.24	1.500D
RA-226	372.01	186.20	425.	104.	0.052	85.53	1.500s
PB-212	477.70	239.03	386.	565.	0.283	19.41	1.500
PB-214	591.19	295.77	179.	146.	0.073	46.05	1.500
AC-228	677.50	338.91	153.	122.	0.061	50.76	1.500
PB-214	704.95	352.63	102.	225.	0.112	27.56	1.500s
TL-208	1023.23	511.72	84.	100.	0.050	56.28	1.416s
TL-208	1168.47	584.32	69.	202.	0.101	30.79	1.345
BI-214	1220.46	610.30	87.	168.	0.084	40.22	1.139s
BI-212	1455.89	727.97	38.	30.	0.015	109.64	1.440s
CS-134	1592.94	796.46	37.	30.	0.015	101.47	1.601
AC-228	1941.00	970.40	36.	78.	0.039	47.13	1.718
K-40	2927.52	1463.30	14.	490.	0.245	13.94	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		1.2260E-01					
			477.56	1.226E-01	&(	3.635E-01 1.08E-01	G
K-40		1.2069E+01					
			1460.75	1.207E+01	(P	5.022E-01 5.61E-01	G
MN-54		-3.5165E-04					
			834.81	-3.517E-04	%(P	5.914E-02 1.66E-02	G
CO-57		1.4772E-02					
			122.07	1.477E-02	%(	5.489E-02 1.65E-02	G K
			136.43	-5.038E-02	%	4.513E-01 1.35E-01	G
CO-60		3.9144E-03					
			1332.51	3.914E-03	&(P	5.124E-02 1.39E-02	G K
			1173.23	1.223E-03	%	7.678E-02 2.16E-02	G K
Sr-85		-4.9086E-03					
			514.00	-4.909E-03	&(	5.793E-02 1.68E-02	G
Kr-85		-3.1402E+02					
			513.99	-3.140E+02	&(	1.139E+03 3.37E+02	G
Y-88		2.5068E-03					
			1836.01	2.507E-03	%(P	4.647E-02 1.17E-02	G K
			898.02	8.724E-04	& P	5.212E-02 1.42E-02	G
NB-94		-2.1970E-03					
			871.10	-2.197E-03	%(	5.399E-02 1.51E-02	G K
			702.50	-4.003E-03	%	4.826E-02 1.37E-02	G K
Ag-108M		-9.8746E-03					
			722.95	-9.875E-03	%(	5.290E-02 1.53E-02	G K
			614.37	-3.938E-02	% P	7.569E-02 2.30E-02	G
			433.93	-1.038E-03	&	4.919E-02 1.42E-02	G
CD-109		-1.0122E-01					
			88.04	-1.012E-01	%(P	2.258E+00 6.73E-01	G
SN-113		2.4292E-02					
			391.71	2.429E-02	&(	5.817E-02 1.75E-02	G K
			255.04	2.700E-01	&	1.768E+00 5.22E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	2.7767E-03						
		427.95	2.777E-03	&(P	1.176E-01	3.33E-02	G K
		600.77	6.107E-02	& P	2.222E-01	6.51E-02	G
		636.15	5.662E-02	% P	4.256E-01	1.22E-01	G
		463.51	3.074E-01	% P	4.599E-01	1.42E-01	G
		176.29	3.516E-02	% P	6.500E-01	1.92E-01	G
I-131	-1.0711E-04						
		364.48	-1.071E-04	&(	6.604E-02	1.90E-02	G K
		636.97	1.650E-01	%	8.809E-01	2.55E-01	G
		284.29	-1.997E-01	&	9.776E-01	2.90E-01	G
CS-134	2.8242E-02						
		604.66	4.551E-03	%(	4.462E-02	1.27E-02	G K
		795.76	5.532E-02	(	5.691E-02	1.87E-02	G
		569.29	-5.513E-02	%	3.126E-01	9.10E-02	G
		801.84	-1.694E-01	% P	6.812E-01	2.00E-01	G
CS-137	3.5831E-02						
		661.62	3.583E-02	&(	6.050E-02	1.86E-02	G
CE-139	-1.5905E-03						
		165.85	-1.591E-03	%(P	5.452E-02	1.61E-02	G
EU-152	-1.1409E-02						
		121.78	-1.141E-02	%(P	1.463E-01	4.34E-02	G K
		344.30	2.468E-02	%	1.461E-01	4.30E-02	G
		1408.08	-4.055E-02	%	2.445E-01	6.80E-02	G
		964.00	-9.554E-02	% P	4.662E-01	1.35E-01	G
		1112.07	2.242E-01	%	3.697E-01	1.16E-01	G
		778.90	-5.880E-02	% P	3.420E-01	9.75E-02	G
EU-154	2.9382E-02						
		123.10	2.938E-02	%(P	1.078E-01	3.24E-02	G K
		1274.80	-2.286E-02	%	2.243E-01	6.38E-02	G
		723.30	-4.437E-02	% P	2.659E-01	7.66E-02	G
		1004.80	-5.265E-02	%	3.429E-01	9.81E-02	G
EU-155	1.9433E-02						
		86.45	1.943E-02	&(P	2.113E-01	6.29E-02	G K
		105.31	7.169E-02	%	2.472E-01	7.43E-02	G
HG-203	3.4654E-02						
		279.17	3.465E-02	%(P	4.732E-02	1.47E-02	G K
		72.87	-2.091E-01	%	2.183E+00	6.53E-01	G
		70.83	-1.311E+00	%	3.926E+00	1.18E+00	G
		82.50	2.623E-01	%	4.282E+00	1.28E+00	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	2.7510E-01						
		583.14	2.751E-01	(P	5.668E-02	2.83E-02	G
		510.72	4.589E-01	+	2.084E-01	8.63E-02	G
PB-212	6.5686E-01						
		238.63	6.569E-01	(	1.095E-01	4.25E-02	G K
							Energy duplication
		77.11	8.813E-01	+	5.799E-01	1.83E-01	G
		74.81	8.647E-01	& P	1.199E+00	3.67E-01	G
PB-214	4.4173E-01						
		351.99	4.329E-01	*(P	9.577E-02	3.98E-02	G K
		295.22	4.589E-01	(	2.040E-01	7.04E-02	G
							Energy duplication
		77.11	1.441E+00	+	9.484E-01	2.99E-01	G
		241.92	3.226E-01	%	7.108E-01	2.15E-01	G
BI-212	3.7268E-01						
		727.17	3.727E-01	@(	3.818E-01	1.36E-01	G K
		1620.56	-3.287E-02	% P	1.979E+00	5.07E-01	G
		785.42	1.198E+00	% P	2.328E+00	7.11E-01	G
BI-214	4.4600E-01						
		609.32	4.460E-01	@(	1.226E-01	5.99E-02	G K
		1764.51	-8.583E-02	% P	4.264E-01	1.20E-01	G
		1120.28	-1.210E-02	%	4.590E-01	1.28E-01	G
RA-224	3.2353E-01						
		241.00	3.235E-01	%(P	1.328E+00	3.97E-01	G
RA-226	1.3414E+00						
		185.99	1.341E+00	*(P	1.279E+00	3.99E-01	G
AC-228	3.9522E-01						
		911.07	6.009E-03	%(P	2.397E-01	6.80E-02	G K
		968.90	8.324E-01	(P	3.282E-01	1.31E-01	G
		338.40	6.995E-01	(	3.451E-01	1.18E-01	G
TH-227	-1.7146E-01						
		236.00	-1.715E-01	%(P	4.535E-01	1.37E-01	G K
		256.25	-1.129E-01	%	6.257E-01	1.86E-01	G
PA-234	-5.1510E-02						
		98.44	-5.151E-02	%(	2.278E-01	6.83E-02	G K
		946.00	4.515E-03	%	2.479E-01	6.80E-02	G
		131.28	7.962E-02	&	2.010E-01	6.07E-02	G
		94.67	-9.379E-03	%	4.575E-01	1.36E-01	G
		883.24	8.543E-03	%	3.335E-01	9.01E-02	G
		926.70	-4.246E-04	%	4.209E-01	1.14E-01	G

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 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26-8.178E-02 %   4.619E-01 1.35E-01 G

TH-234       7.4158E-01
                           63.29 7.416E-01 %(P 4.722E+00 1.41E+00 G K
                           92.80 1.668E+00 %   2.398E+00 7.34E-01 G
                           92.38 1.714E+00 % P 2.908E+00 8.85E-01 G

AM-241      -5.5620E-02
                           59.54-5.562E-02 %(  6.506E-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	1.1586E-01	1.2260E-01	3.2385E-01	3.2393E-01	3.435E-01
K-40		1.2069E+01	1.2069E+01	1.6834E+00	1.8145E+00	5.022E-01
MN-54	#A	-3.4827E-04	-3.5165E-04	2.1193E-02	2.1193E-02	5.857E-02
CO-57	#B	1.4608E-02	1.4772E-02	4.9432E-02	4.9439E-02	5.428E-02
CO-60	#B	3.9083E-03	3.9144E-03	4.1622E-02	4.1622E-02	5.116E-02

Sr-85	#A	-4.6853E-03	-4.9086E-03	5.0522E-02	5.0523E-02	5.530E-02
Kr-85	#A	-3.1401E+02	-3.1402E+02	1.0119E+03	1.0121E+03	1.139E+03
Y-88	#B	2.4368E-03	2.5068E-03	3.5163E-02	3.5163E-02	4.517E-02
NB-94	#B	-2.1970E-03	-2.1970E-03	4.5349E-02	4.5349E-02	5.399E-02
Ag-108M	#B	-9.8740E-03	-9.8746E-03	4.5817E-02	4.5820E-02	5.290E-02
CD-109	#A	-1.0055E-01	-1.0122E-01	3.1479E+00	3.1479E+00	2.243E+00
SN-113	#B	2.3663E-02	2.4292E-02	5.2542E-02	5.2560E-02	5.667E-02
SB-125	#B	2.7684E-03	2.7767E-03	9.9774E-02	9.9774E-02	1.172E-01
I-131	#B	-7.3575E-05	-1.0711E-04	5.6866E-02	5.6866E-02	4.536E-02
CS-134	#B	2.8129E-02	2.8242E-02	2.8657E-02	2.8701E-02	4.444E-02
CS-137	#A	3.5821E-02	3.5831E-02	5.5933E-02	5.5969E-02	6.049E-02
CE-139	#A	-1.5560E-03	-1.5905E-03	6.4499E-02	6.4499E-02	5.333E-02
EU-152	#B	-1.1402E-02	-1.1409E-02	1.6170E-01	1.6171E-01	1.462E-01
EU-154	#B	2.9353E-02	2.9382E-02	9.7070E-02	9.7084E-02	1.077E-01
EU-155	#B	1.9401E-02	1.9433E-02	1.8857E-01	1.8857E-01	2.110E-01
HG-203	#B	3.2480E-02	3.4654E-02	4.3969E-02	4.4012E-02	4.435E-02
TL-208		2.7510E-01	2.7510E-01	8.4862E-02	8.6255E-02	
PB-212	#	6.5686E-01	6.5686E-01	1.2748E-01	1.3270E-01	1.095E-01
PB-214	#	4.4173E-01	4.4173E-01	1.1859E-01	1.2116E-01	9.577E-02
BI-212	#A	3.7268E-01	3.7268E-01	4.0861E-01	4.0914E-01	
BI-214	#	4.4600E-01	4.4600E-01	1.7938E-01	1.8112E-01	
RA-224	#A	3.2353E-01	3.2353E-01	1.1923E+00	1.1924E+00	1.328E+00
RA-226	#	1.3414E+00	1.3414E+00	1.1968E+00	1.1991E+00	1.279E+00
AC-228	F	3.9522E-01	3.9522E-01	1.8635E-01	1.8766E-01	2.397E-01
TH-227	#B	-1.7146E-01	-1.7146E-01	4.1627E-01	4.1638E-01	4.535E-01
PA-234	#B	-5.1510E-02	-5.1510E-02	2.0481E-01	2.0483E-01	2.278E-01
TH-234	#B	7.4158E-01	7.4158E-01	4.2378E+00	4.2380E+00	4.722E+00
AM-241	#A	-5.5619E-02	-5.5620E-02	5.8111E-01	5.8112E-01	6.505E-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 (1121.8 to 1999.0 keV) 1.3558231E+01 pCi/gm
Total Decayed Activity (1121.8 to 1999.0 keV) 1.3558231E+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_1AUG2006_0814.An1

Sample description
FSS-OOL-10-04-010-F

Spectrum Filename: C:\GammaVision\Spectra\103F_1AUG2006_0814.An1

Acquisition information
Start time: 01-Aug-2006 08:15:47
Live time: 2000
Real time: 2005
Dead time: 0.25 %
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: 2.0800E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 2.0800E+03) =
4.8077E+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	27-Jul-2006 08:30:00
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. 16 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.1549

***** 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	127.	23.16	0.99	9.052E-03	74.81	9.600	9.524E-01	PB212
77.22	208.	12.00	0.99	1.011E-02	77.11	17.500	8.284E-01	PB212
93.08	102.	39.67	1.50	1.631E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
93.09	109.	37.11	1.50	1.645E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
186.30	111.	27.75	1.36	2.566E-02	185.99	3.280	PBC<MDA	RA226
209.29	112.	32.00	0.81	2.471E-02				
238.85	1263.	3.37	1.09	2.319E-02	238.63	43.100	8.132E-01	PB212
241.85	170.	17.00	1.10	2.303E-02	241.00	3.900	1.227E+00	RA224
					241.92	7.470	6.417E-01	PB214
270.46	131.	23.99	0.81	2.150E-02				
295.25	270.	11.80	1.13	2.025E-02	295.22	19.200	4.438E-01	PB214
300.23	85.	29.13	1.40	2.001E-02				
328.50	91.	30.26	1.33	1.872E-02				
338.40	249.	15.26	1.35	1.830E-02	338.40	12.010	7.319E-01	AC228
351.94	497.	7.21	1.08	1.776E-02	351.99	37.100	4.850E-01	PB214
408.99	69.	31.55	0.82	1.576E-02				
430.99	36.	33.03	0.55	1.511E-02				
463.04	87.	25.78	1.21	1.426E-02				
463.04	87.	25.78	1.21	1.426E-02	463.51	10.000	3.923E-01	SB125
510.71	198.	13.15	1.25	1.317E-02	510.72	22.500	3.756E-01	TL208
583.21	515.	6.40	1.37	1.184E-02	583.14	86.000	3.260E-01	TL208
609.47	384.	7.28	1.45	1.144E-02	609.32	46.090	4.651E-01	BI214
727.18	117.	15.50	1.51	9.965E-03	727.17	11.800	6.426E-01	BI212
769.20	62.	31.44	1.38	9.545E-03				
795.53	76.	28.09	1.54	9.303E-03				

795.53	76.	28.09	1.54	9.303E-03	795.76	85.400	6.205E-02	CS134
860.50	69.	33.58	1.38	8.768E-03				
911.30	317.	6.94	1.43	8.400E-03	911.07	29.000	8.363E-01	AC228
968.10	239.	9.75	1.61	8.031E-03	968.90	17.460	1.107E+00	AC228
1120.70	134.	17.18	1.64	7.210E-03	1120.28	15.040	7.913E-01	BI214
1461.01	1371.	2.77	1.77	5.931E-03	1460.75	10.700	1.385E+01	K40
1588.71	77.	14.05	1.48	5.571E-03				
1764.67	82.	11.04	1.83	5.141E-03	1764.51	15.920	6.249E-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
417.75	209.29	511.	112.	0.056	96.01	0.810	AC-228
540.08	270.46	357.	131.	0.065	71.98	0.809	AC-228 s
599.60	300.23	240.	85.	0.043	87.38	1.395	PB-212 s
656.14	328.50	267.	91.	0.045	90.79	1.325	RH-106M s
817.11	408.99	162.	69.	0.034	94.66	0.820	CS-138 s
1537.46	769.20	106.	62.	0.031	94.32	1.380	BI-214 M
1720.04	860.50	117.	69.	0.034	75.68	1.377	TL-208
3176.24	1588.71	8.	77.	0.038	42.14	1.475	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	395.	127.	0.064	69.49	0.993D
PB-212	153.39	77.11	413.	208.	0.104	36.01	0.995A
RA-226	371.89	186.36	850.	120.	0.060	95.59	1.500s
PB-212	476.79	238.82	847.	1165.	0.583	14.93	0.883
RA-224	482.91	241.87	876.	150.	0.075	87.01	1.500
PB-214	482.72	241.78	393.	92.	0.046	91.99	1.767s
PB-214	589.66	295.25	313.	266.	0.133	35.40	1.134
AC-228	675.94	338.40	385.	248.	0.124	45.78	1.353
PB-214	703.01	351.94	277.	492.	0.246	21.63	1.083
SB-125	925.35	463.12	167.	78.	0.039	76.86	1.500
TL-208	1020.54	510.71	187.	171.	0.086	39.45	1.247s
TL-208	1165.53	583.21	163.	511.	0.256	19.19	1.368
BI-214	1218.04	609.47	135.	377.	0.189	21.84	1.455
BI-212	1453.42	727.18	79.	116.	0.058	46.51	1.506s
CS-134	1589.51	795.23	88.	49.	0.025	90.89	1.500s
AC-228	1821.63	911.30	67.	314.	0.157	20.81	1.426
AC-228	1935.22	968.10	92.	239.	0.119	29.24	1.612s
BI-214	2240.38	1120.70	101.	132.	0.066	51.54	1.636s
K-40	2920.88	1461.01	38.	1353.	0.676	8.32	1.772
BI-214	3528.10	1764.67	3.	79.	0.039	33.13	1.834

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		8.9256E-02					
			477.56	8.926E-02	&(	2.895E-01 8.64E-02	G
K-40		1.3846E+01					
			1460.75	1.385E+01	(P	3.230E-01 3.89E-01	G
MN-54		-1.0219E-02					
			834.81	-1.022E-02	%(P	3.657E-02 1.08E-02	G
CO-57		-1.5179E-02					
			122.07	-1.518E-02	%(P	4.601E-02 1.39E-02	G K
			136.43	-5.455E-02	%	3.853E-01 1.15E-01	G
CO-60		-1.4497E-03					
			1332.51	-1.450E-03	%(P	3.467E-02 9.45E-03	G K
			1173.23	1.443E-02	% P	4.239E-02 1.26E-02	G K
Sr-85		-1.1458E-02					
			514.00	-1.146E-02	%(	4.235E-02 1.27E-02	G
Kr-85		-2.5059E+02					
			513.99	-2.506E+02	%(	9.269E+02 2.77E+02	G
Y-88		2.9860E-03					
			1836.01	2.986E-03	&(P	2.319E-02 6.25E-03	G K
			898.02	-1.712E-03	& P	3.424E-02 9.71E-03	G
NB-94		3.3735E-04					
			871.10	3.374E-04	%(	3.049E-02 8.65E-03	G K
			702.50	-6.758E-04	%	3.617E-02 1.05E-02	G K
Ag-108M		-2.3541E-02					
			722.95	-2.354E-02	%(	4.656E-02 1.42E-02	G K
			614.37	-1.963E-02	& P	3.794E-02 1.15E-02	G
			433.93	-7.702E-03	%	3.066E-02 9.12E-03	G
CD-109		1.5814E-01					
			88.04	1.581E-01	%(	1.629E+00 4.87E-01	G
SN-113		1.3174E-02					
			391.71	1.317E-02	%(	4.249E-02 1.27E-02	G K
			255.04	2.525E-02	%	1.444E+00 4.27E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	7.4119E-02						
		427.95	-2.124E-02	&(P	9.991E-02	2.96E-02	G K
		600.77	3.065E-03	& P	1.559E-01	4.49E-02	G
		636.15	2.244E-02	& P	2.711E-01	7.86E-02	G
		463.51	3.564E-01	(P	2.882E-01	9.28E-02	G
		176.29	-7.715E-02	%	5.342E-01	1.60E-01	G
I-131	-3.3501E-03						
		364.48	-3.350E-03	%(P	5.357E-02	1.57E-02	G K
		636.97	1.684E-01	&	5.429E-01	1.61E-01	G
		284.29	-1.783E-01	% P	8.077E-01	2.41E-01	G
CS-134	1.8641E-02						
		604.66	-6.185E-04	%(	6.680E-02	1.98E-02	G K
		795.76	4.065E-02	*(P	3.816E-02	1.23E-02	G
		569.29	-2.339E-03	& P	1.914E-01	5.50E-02	G
		801.84	-7.846E-02	% P	4.150E-01	1.21E-01	G
CS-137	9.5437E-03						
		661.62	9.544E-03	%(P	3.397E-02	1.00E-02	G
CE-139	-2.7829E-03						
		165.85	-2.783E-03	%(	4.439E-02	1.32E-02	G
EU-152	-4.5710E-02						
		121.78	-4.571E-02	%(P	1.336E-01	4.03E-02	G K
		344.30	3.083E-05	% P	1.112E-01	3.27E-02	G
		1408.08	7.318E-02	&	1.262E-01	3.92E-02	G
		964.00	-9.293E-02	% P	3.043E-01	9.04E-02	G
		1112.07	8.141E-02	%	2.545E-01	7.54E-02	G
		778.90	-2.792E-02	%	2.472E-01	7.17E-02	G
EU-154	1.6091E-04						
		123.10	1.609E-04	%(	9.942E-02	2.96E-02	G K
		1274.80	1.935E-02	&	1.164E-01	3.38E-02	G
		723.30	-9.443E-02	%	2.232E-01	6.74E-02	G
		1004.80	-4.612E-03	%	1.798E-01	5.09E-02	G
EU-155	3.8898E-02						
		86.45	3.890E-02	%(	1.955E-01	5.86E-02	G K
		105.31	9.272E-02	%	2.199E-01	6.65E-02	G
HG-203	2.6063E-03						
		279.17	2.606E-03	&(P	4.118E-02	1.22E-02	G K
		72.87	-7.633E-01	& P	2.294E+00	6.92E-01	G
		70.83	4.279E-01	%	2.924E+00	8.71E-01	G
		82.50	-1.065E-01	&	4.095E+00	1.22E+00	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	3.3626E-01						
		583.14	3.260E-01	(P	3.966E-02	2.10E-02	G
		510.72	3.756E-01	*(P	1.455E-01	5.71E-02	G
PB-212	7.7778E-01						
		238.63	7.572E-01	(P	8.987E-02	3.81E-02	G K
							Energy duplication
		77.11	7.617E-01	} P	3.577E-01	9.14E-02	G
		74.81	9.524E-01	+ P	7.124E-01	2.26E-01	G
PB-214	4.7093E-01						
		351.99	4.850E-01	(P	7.922E-02	3.54E-02	G K
		295.22	4.438E-01	(P	1.424E-01	5.32E-02	G
							Energy duplication
		77.11	0.000E+00	} P	8.208E-01	0.00E+00	G
		241.92	3.483E-01	-	3.592E-01	1.07E-01	G
BI-212	6.4262E-01						
		727.17	6.426E-01	@(P	2.434E-01	1.00E-01	G K
		1620.56	1.756E-01	% P	8.983E-01	2.52E-01	G
		785.42	9.593E-01	%	1.632E+00	5.01E-01	G
BI-214	4.6509E-01						
		609.32	4.651E-01	(P	6.995E-02	3.44E-02	G K
		1764.51	6.249E-01	+ P	8.841E-02	7.19E-02	G
		1120.28	7.913E-01	+ P	2.966E-01	1.38E-01	G
RA-224	1.0858E+00						
		241.00	1.086E+00	(	1.015E+00	3.15E-01	G
RA-226	9.2989E-01						
		185.99	9.299E-01	(P	1.070E+00	3.28E-01	G
AC-228	8.0575E-01						
		911.07	8.363E-01	(P	1.092E-01	5.86E-02	G K
		968.90	1.107E+00	+ P	2.200E-01	1.08E-01	G
		338.40	7.319E-01	(P	2.784E-01	1.12E-01	G
TH-227	8.3076E-02						
		236.00	8.308E-02	%(	2.416E-01	7.27E-02	G K
		256.25	1.198E-01	% P	4.639E-01	1.39E-01	G
PA-234	1.6128E-03						
		98.44	1.613E-03	&(P	2.191E-01	6.53E-02	G K
		946.00	5.517E-02	% P	1.519E-01	4.53E-02	G
		131.28	9.112E-03	& P	2.080E-01	6.21E-02	G
		94.67	-1.245E-01	& P	3.459E-01	1.04E-01	G
		883.24	-1.054E-03	%	2.193E-01	6.14E-02	G
		926.70	6.002E-02	%	2.592E-01	7.57E-02	G

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 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26-2.118E-02 & P 3.036E-01 8.77E-02 G

TH-234       1.0977E+00
                           63.29 1.098E+00 %(P 6.163E+00 1.84E+00 G K
                           92.80 1.430E+00 % P 2.026E+00 6.17E-01 G
                           92.38 1.585E+00 & P 2.426E+00 7.37E-01 G

AM-241      -7.9969E-02
                           59.54-7.997E-02 %(P 1.069E+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	8.3658E-02	8.9256E-02	2.5927E-01	2.5932E-01	2.714E-01
K-40		1.3846E+01	1.3846E+01	1.1676E+00	1.4176E+00	
MN-54	#A	-1.0106E-02	-1.0219E-02	3.4165E-02	3.4170E-02	3.616E-02
CO-57	#B	-1.4986E-02	-1.5179E-02	4.2391E-02	4.2400E-02	4.543E-02
CO-60	#B	-1.4471E-03	-1.4497E-03	9.3436E-02	9.3437E-02	3.461E-02

Sr-85	#A	-1.0863E-02	-1.1458E-02	3.7980E-02	3.7985E-02	4.015E-02
Kr-85	#A	-2.5058E+02	-2.5059E+02	8.3121E+02	8.3134E+02	9.268E+02
Y-88	#B	2.8907E-03	2.9860E-03	1.8742E-02	1.8743E-02	2.245E-02
NB-94	#B	3.3735E-04	3.3735E-04	2.5957E-02	2.5957E-02	3.049E-02
Ag-108M	#B	-2.3539E-02	-2.3541E-02	4.2453E-02	4.2475E-02	4.656E-02
CD-109	#A	1.5694E-01	1.5814E-01	1.4595E+00	1.4595E+00	1.616E+00
SN-113	#B	1.2784E-02	1.3174E-02	3.8118E-02	3.8126E-02	4.124E-02
SB-125	#B	7.3866E-02	7.4119E-02	5.7900E-02	5.8060E-02	9.957E-02
I-131	#B	-2.1788E-03	-3.3501E-03	6.3182E-02	6.3182E-02	3.484E-02
CS-134	#B	1.8555E-02	1.8641E-02	1.6973E-02	1.7007E-02	6.649E-02
CS-137	#A	9.5407E-03	9.5437E-03	3.0090E-02	3.0095E-02	3.396E-02
CE-139	#A	-2.7138E-03	-2.7829E-03	3.9726E-02	3.9727E-02	4.329E-02
EU-152	#B	-4.5676E-02	-4.5710E-02	1.2568E-01	1.2571E-01	1.335E-01
EU-154	#B	1.6073E-04	1.6091E-04	8.8839E-02	8.8839E-02	9.931E-02
EU-155	#B	3.8824E-02	3.8898E-02	1.7594E-01	1.7595E-01	1.951E-01
HG-203	#B	2.4198E-03	2.6063E-03	3.6618E-02	3.6618E-02	3.824E-02
TL-208		3.3626E-01	3.3626E-01	6.5055E-02	6.7921E-02	
PB-212		7.7778E-01	7.7778E-01	1.1728E-01	1.2568E-01	
PB-214		4.7093E-01	4.7093E-01	9.9073E-02	1.0278E-01	
BI-212	#	6.4262E-01	6.4262E-01	3.0018E-01	3.0249E-01	
BI-214		4.6509E-01	4.6509E-01	1.0331E-01	1.0678E-01	
RA-224		1.0858E+00	1.0858E+00	9.4480E-01	9.4690E-01	1.015E+00
RA-226	#A	9.2989E-01	9.2989E-01	9.8448E-01	9.8596E-01	1.070E+00
AC-228		8.0575E-01	8.0575E-01	1.6945E-01	1.7579E-01	
TH-227	#B	8.3076E-02	8.3076E-02	2.1816E-01	2.1822E-01	2.416E-01
PA-234	#B	1.6128E-03	1.6128E-03	1.9598E-01	1.9598E-01	2.191E-01
TH-234	#B	1.0977E+00	1.0977E+00	5.5328E+00	5.5331E+00	6.163E+00
AM-241	#A	-7.9967E-02	-7.9969E-02	9.9504E-01	9.9505E-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 (83.4 to 2000.7 keV) 1.8429949E+01 pCi/gm
Total Decayed Activity (83.4 to 2000.7 keV) 1.8429949E+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_1AUG.An1

Sample description
FSS-OOL-10-04-015-F

Spectrum Filename: C:\GammaVision\Spectra\103F_1AUG.An1

Acquisition information
Start time: 01-Aug-2006 11:53:45
Live time: 2000
Real time: 2002
Dead time: 0.12 %
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: 2.2320E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 2.2320E+03) =
4.4803E+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	27-Jul-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. 22 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
74.85	180.	17.27	0.99	9.052E-03	74.81	9.600	1.252E+00	PB212
77.15	215.	11.68	0.99	1.011E-02	77.11	17.500	7.576E-01	PB212
87.27	79.	40.59	1.00	1.448E-02	86.45	32.740	1.034E-01	EU155
					88.04	3.790	8.612E-01	CD109
93.66	120.	26.03	1.00	1.680E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
186.40	166.	22.79	1.38	2.565E-02	185.99	3.280	1.098E+00	RA226
209.72	112.	32.41	1.20	2.469E-02				
238.95	1195.	3.45	1.09	2.318E-02	238.63	43.100	7.162E-01	PB212
241.53	165.	22.23	1.09	2.304E-02	241.00	3.900	1.109E+00	RA224
					241.92	7.470	5.800E-01	PB214
270.26	114.	28.31	1.49	2.151E-02				
295.28	258.	10.55	1.20	2.025E-02	295.22	19.200	3.949E-01	PB214
300.45	90.	26.11	1.76	2.000E-02				
338.52	276.	11.17	1.39	1.830E-02	338.40	12.010	7.575E-01	AC228
351.98	488.	6.70	1.08	1.775E-02	351.99	37.100	4.434E-01	PB214
463.28	100.	18.64	1.47	1.425E-02				
463.28	100.	18.64	1.47	1.425E-02	463.51	10.000	4.214E-01	SB125
510.99	188.	12.38	1.48	1.317E-02	510.72	22.500	3.296E-01	TL208
583.30	388.	6.80	1.16	1.184E-02	583.14	86.000	2.281E-01	TL208
609.50	364.	8.16	1.52	1.144E-02	609.32	46.090	4.101E-01	BI214
661.43	104.	25.42	0.87	1.072E-02	661.62	84.620	6.849E-02	CS137
727.60	121.	15.71	1.82	9.960E-03	727.17	11.800	6.225E-01	BI212
795.39	49.	26.85	1.50	9.301E-03	795.76	85.400	3.787E-02	CS134
860.85	40.	28.94	0.97	8.765E-03				
911.47	274.	9.01	1.28	8.399E-03	911.07	29.000	6.715E-01	AC228
964.93	40.	37.97	1.54	8.056E-03	964.00	14.580	PBC<MDA	EU152

968.76	207.	12.30	1.67	8.027E-03	968.90	17.460	8.929E-01	AC228
1120.83	103.	17.86	1.61	7.209E-03	1120.28	15.040	5.660E-01	BI214
1461.25	1531.	2.63	1.89	5.930E-03	1460.75	10.700	1.443E+01	K40
1764.94	58.	16.72	1.65	5.141E-03	1764.51	15.920	4.048E-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	
173.70	87.41	471.	79.	0.039	121.76	1.001	PB-214	lD
418.59	209.72	521.	112.	0.056	97.23	1.201	NP-239	
539.67	270.26	388.	114.	0.057	84.92	1.494	AC-228	s
600.05	300.45	210.	90.	0.045	78.32	1.764	PB-212	s
1720.74	860.85	47.	40.	0.020	86.82	0.973	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	410.	180.	0.090	51.81	0.993D
PB-212	153.39	77.11	407.	215.	0.108	35.03	0.995A
TH-234	186.28	93.55	1027.	114.	0.057	105.36	1.500s
RA-226	371.96	186.40	585.	153.	0.076	68.38	1.377s
PB-212	477.21	239.03	522.	1277.	0.638	11.91	0.960
RA-224	482.56	241.70	711.	163.	0.082	73.11	1.500
PB-214	482.98	241.91	758.	122.	0.061	99.77	1.500s
PB-214	589.72	295.28	222.	254.	0.127	31.64	1.202s
AC-228	676.18	338.52	251.	275.	0.138	33.50	1.386s
PB-214	703.11	351.98	230.	482.	0.241	20.11	1.076
SB-125	925.30	463.09	141.	91.	0.046	62.53	1.500s
TL-208	1021.09	510.99	163.	161.	0.081	37.14	1.481s
TL-208	1165.70	583.30	127.	384.	0.192	20.39	1.158
CS-134	1213.98	607.44	207.	-55.	-0.028	117.93	1.500s
BI-214	1218.10	609.50	163.	357.	0.179	24.47	1.522
CS-137	1321.95	661.43	171.	103.	0.051	76.27	0.874s
BI-212	1454.27	727.60	84.	121.	0.060	47.14	1.815s
CS-134	1589.84	795.39	64.	49.	0.025	80.54	1.500s
AC-228	1821.97	911.47	102.	270.	0.135	27.04	1.280
EU-152	1928.87	964.93	99.	40.	0.020	113.92	1.538
AC-228	1936.54	968.76	122.	207.	0.103	36.89	1.668
BI-214	2240.63	1120.83	84.	101.	0.051	53.57	1.610
K-40	2921.38	1461.25	40.	1513.	0.756	7.89	1.885
BI-214	3528.63	1764.94	12.	55.	0.027	50.15	1.647

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		9.6911E-02					
			477.56	9.691E-02	%(	2.921E-01 8.75E-02	G
K-40		1.4428E+01					
			1460.75	1.443E+01	(P	3.085E-01 3.84E-01	G
MN-54		-1.1964E-03					
			834.81	-1.196E-03	%(P	2.775E-02 7.88E-03	G
CO-57		2.5896E-04					
			122.07	2.590E-04	%(P	4.382E-02 1.30E-02	G K
			136.43	-5.821E-02	%	3.477E-01 1.04E-01	G
CO-60		8.8885E-03					
			1332.51	8.888E-03	%(P	3.240E-02 9.38E-03	G K
			1173.23	3.835E-03	% P	4.169E-02 1.20E-02	G K
Sr-85		-1.7864E-02					
			514.00	-1.786E-02	%(	4.133E-02 1.25E-02	G
Kr-85		-3.9064E+02					
			513.99	-3.906E+02	%(	9.039E+02 2.73E+02	G
Y-88		-2.1830E-03					
			1836.01	-2.183E-03	&(P	2.655E-02 7.19E-03	G K
			898.02	-3.153E-03	% P	3.187E-02 9.10E-03	G
NB-94		-6.5369E-03					
			871.10	-6.537E-03	%(	3.130E-02 9.18E-03	G K
			702.50	4.008E-04	&	3.245E-02 9.37E-03	G K
Ag-108M		-7.1151E-04					
			722.95	-7.115E-04	%(	5.669E-02 1.67E-02	G K
			614.37	-9.486E-03	% P	3.446E-02 1.02E-02	G
			433.93	-1.860E-03	&	3.213E-02 9.43E-03	G
CD-109		6.9209E-01					
			88.04	6.921E-01	&(	1.623E+00 4.91E-01	G
SN-113		2.7289E-05					
			391.71	2.729E-05	%(	4.157E-02 1.21E-02	G K
			255.04	6.351E-03	&	1.420E+00 4.20E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	8.5937E-02						
		427.95	-1.646E-02	%(P	8.651E-02	2.56E-02	G K
		600.77	-2.396E-02	% P	1.516E-01	4.44E-02	G
		636.15	-7.335E-02	% P	2.724E-01	8.06E-02	G
		463.51	3.890E-01	@(P	2.475E-01	8.22E-02	G
		176.29	-4.730E-02	&	5.235E-01	1.56E-01	G
I-131	-4.5692E-04						
		364.48	-4.569E-04	%(P	5.651E-02	1.66E-02	G K
		636.97	4.144E-02	%	5.960E-01	1.73E-01	G
		284.29	-1.429E-01	% P	7.723E-01	2.30E-01	G
CS-134	-2.9850E-02						
		604.66	-2.985E-02	&(	3.779E-02	1.17E-02	G K
		795.76	3.787E-02	+ P	3.057E-02	1.02E-02	G
		569.29	6.099E-02	% P	1.470E-01	4.40E-02	G
		801.84	-1.904E-02	% P	2.326E-01	6.33E-02	G
CS-137	6.8494E-02						
		661.62	6.849E-02	*(P	4.253E-02	1.76E-02	G
CE-139	4.7187E-03						
		165.85	4.719E-03	&(	4.179E-02	1.25E-02	G
EU-152	6.0204E-02						
		121.78	-1.274E-02	%(P	1.319E-01	3.94E-02	G K
		344.30	-2.380E-02	% P	1.058E-01	3.15E-02	G
		1408.08	0.000E+00	&	1.490E-01	4.14E-02	G
		964.00	2.065E-01	(P	2.531E-01	7.95E-02	G
		1112.07	4.300E-02	%	2.432E-01	7.07E-02	G
		778.90	2.153E-02	%	2.338E-01	6.77E-02	G
EU-154	1.2687E-02						
		123.10	1.269E-02	%(	9.348E-02	2.80E-02	G K
		1274.80	6.586E-04	%	1.004E-01	2.84E-02	G
		723.30	-7.289E-02	%	1.959E-01	5.89E-02	G
		1004.80	5.633E-02	%	1.557E-01	4.64E-02	G
EU-155	-1.2585E-02						
		86.45	-1.258E-02	%(	2.154E-01	6.44E-02	G K
		105.31	8.755E-02	%	2.020E-01	6.12E-02	G
HG-203	7.9551E-04						
		279.17	7.955E-04	%(P	4.066E-02	1.20E-02	G K
		72.87	-8.114E-01	% P	1.961E+00	5.93E-01	G
		70.83	1.948E-01	%	3.619E+00	1.08E+00	G
		82.50	-2.855E-01	&	3.606E+00	1.08E+00	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	2.2805E-01						
		583.14	2.281E-01	(P	3.286E-02	1.57E-02	G
		510.72	3.296E-01	+ P	1.269E-01	4.76E-02	G
PB-212	7.6857E-01						
		238.63	7.730E-01	(P	6.613E-02	3.10E-02	G K
							Energy duplication
		77.11	7.358E-01	} P	3.307E-01	8.59E-02	G
		74.81	1.252E+00	+ P	6.765E-01	2.20E-01	G
PB-214	4.2704E-01						
		351.99	4.434E-01	(P	6.741E-02	3.01E-02	G K
		295.22	3.949E-01	@(P	1.125E-01	4.23E-02	G
							Energy duplication
		77.11	1.758E-01	} P	7.785E-01	2.14E-01	G
		241.92	4.285E-01	(	4.613E-01	1.42E-01	G
BI-212	6.2255E-01						
		727.17	6.225E-01	*(P	2.340E-01	9.83E-02	G K
		1620.56	1.903E-01	% P	7.827E-01	2.22E-01	G
		785.42	4.878E-01	%	1.590E+00	4.73E-01	G
BI-214	4.0874E-01						
		609.32	4.101E-01	(P	7.141E-02	3.41E-02	G K
		1764.51	4.048E-01	(P	1.408E-01	7.17E-02	G
		1120.28	5.660E-01	+ P	2.530E-01	1.03E-01	G
RA-224	1.0992E+00						
		241.00	1.099E+00	(	8.541E-01	2.68E-01	G
RA-226	1.0978E+00						
		185.99	1.098E+00	*(P	8.303E-01	2.72E-01	G
AC-228	6.9672E-01						
		911.07	6.715E-01	(P	1.236E-01	6.13E-02	G K
		968.90	8.929E-01	+ P	2.344E-01	1.10E-01	G
		338.40	7.575E-01	(P	2.108E-01	8.49E-02	G
TH-227	-3.2469E-02						
		236.00	-3.247E-02	%(	3.299E-01	9.86E-02	G K
		256.25	1.168E-01	% P	4.126E-01	1.24E-01	G
PA-234	-1.2747E-01						
		98.44	-1.275E-01	%(P	1.782E-01	5.45E-02	G K
		946.00	-2.712E-03	% P	1.368E-01	3.86E-02	G
		131.28	2.098E-02	% P	1.889E-01	5.65E-02	G
		94.67	8.957E-03	% P	3.536E-01	1.06E-01	G
		883.24	2.401E-02	%	2.296E-01	6.59E-02	G
		926.70	-7.438E-02	%	2.623E-01	7.74E-02	G

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 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26 6.648E-02 % P 2.245E-01 6.63E-02 G

TH-234       5.3006E-01
                           63.29-2.097E-01 %(P 5.611E+00 1.66E+00 G K
                           92.80 1.292E+00 & P 1.915E+00 5.82E-01 G
                           92.38 1.653E+00 &(P 2.196E+00 6.70E-01 G

AM-241       1.5087E-01
                           59.54 1.509E-01 &(P 9.396E-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	9.0740E-02	9.6911E-02	2.6237E-01	2.6243E-01	2.735E-01
K-40		1.4428E+01	1.4428E+01	1.1519E+00	1.4242E+00	
MN-54	#A	-1.1830E-03	-1.1964E-03	3.5773E-02	3.5774E-02	2.744E-02
CO-57	#B	2.5561E-04	2.5896E-04	3.9149E-02	3.9149E-02	4.326E-02
CO-60	#B	8.8723E-03	8.8885E-03	2.8131E-02	2.8136E-02	3.234E-02

Sr-85	#A	-1.6921E-02	-1.7864E-02	3.7489E-02	3.7503E-02	3.915E-02
Kr-85	#A	-3.9062E+02	-3.9064E+02	8.1983E+02	8.2014E+02	9.039E+02
Y-88	#B	-2.1122E-03	-2.1830E-03	2.3206E-02	2.3206E-02	2.569E-02
NB-94	#B	-6.5369E-03	-6.5369E-03	2.7532E-02	2.7535E-02	3.130E-02
Ag-108M	#B	-7.1146E-04	-7.1151E-04	5.0010E-02	5.0010E-02	5.669E-02
CD-109	#A	6.8674E-01	6.9209E-01	1.4736E+00	1.4741E+00	1.610E+00
SN-113	#B	2.6468E-05	2.7289E-05	3.6382E-02	3.6382E-02	4.032E-02
SB-125	#B	8.5639E-02	8.5937E-02	5.4492E-02	5.4720E-02	8.621E-02
I-131	#B	-2.9517E-04	-4.5692E-04	6.8078E-02	6.8078E-02	3.651E-02
CS-134	#A	-2.9711E-02	-2.9850E-02	3.5201E-02	3.5244E-02	3.762E-02
CS-137	#	6.8472E-02	6.8494E-02	5.2944E-02	5.3093E-02	
CE-139	#A	4.5997E-03	4.7187E-03	3.7482E-02	3.7483E-02	4.074E-02
EU-152	#B	6.0159E-02	6.0204E-02	6.9518E-02	6.9598E-02	1.318E-01
EU-154	#B	1.2672E-02	1.2687E-02	8.3974E-02	8.3977E-02	9.337E-02
EU-155	#B	-1.2560E-02	-1.2585E-02	1.9328E-01	1.9328E-01	2.150E-01
HG-203	#B	7.3773E-04	7.9551E-04	3.6120E-02	3.6120E-02	3.771E-02
TL-208		2.2805E-01	2.2805E-01	4.7024E-02	4.8852E-02	
PB-212		7.6857E-01	7.6857E-01	9.2369E-02	1.0258E-01	
PB-214		4.2704E-01	4.2704E-01	8.6895E-02	9.0362E-02	
BI-212	#	6.2255E-01	6.2255E-01	2.9465E-01	2.9686E-01	
BI-214		4.0874E-01	4.0874E-01	1.0184E-01	1.0457E-01	
RA-224		1.0992E+00	1.0992E+00	8.0359E-01	8.0612E-01	8.541E-01
RA-226	#	1.0978E+00	1.0978E+00	8.1442E-01	8.1691E-01	
AC-228		6.9672E-01	6.9672E-01	1.5109E-01	1.5641E-01	
TH-227	#B	-3.2469E-02	-3.2469E-02	2.9578E-01	2.9579E-01	3.299E-01
PA-234	#B	-1.2747E-01	-1.2747E-01	1.6693E-01	1.6708E-01	1.782E-01
TH-234	#B	5.3006E-01	5.3006E-01	6.4460E-01	6.4527E-01	5.611E+00
AM-241	#A	1.5087E-01	1.5087E-01	8.4306E-01	8.4310E-01	9.395E-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) 1.9845146E+01 pCi/gm
Total Decayed Activity (87.4 to 2000.7 keV) 1.9845177E+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_8AUG2006_1907.An1

Sample description
FSS-OOL-10-04-012-F

Spectrum Filename: C:\GammaVision\Spectra\103F_8AUG2006_1907.An1

Acquisition information
Start time: 08-Aug-2006 19:07:07
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: 1.9910E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.9910E+03) =
5.0226E+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	27-Jul-2006 10:06:00
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: 0.3084

***** 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	103.	26.88	0.99	9.084E-03	72.87	6.400	PBC<MDA	HG203
					74.81	9.600	7.835E-01	PB212
77.35	174.	16.39	0.99	1.029E-02	77.11	17.500	6.551E-01	PB212
					77.11	10.700	1.071E+00	PB214
87.38	104.	38.27	1.50	1.472E-02	86.45	32.740	PBC<MDA	EU155
					88.04	3.790	1.289E+00	CD109
93.10	112.	34.85	1.34	1.656E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
99.79	86.	32.69	1.40	1.867E-02				
129.28	81.	37.87	0.96	2.439E-02				
186.35	143.	25.33	1.39	2.566E-02	185.99	3.280	1.045E+00	RA226
210.04	120.	28.96	1.45	2.468E-02				
238.83	889.	4.04	1.09	2.319E-02	238.63	43.100	5.951E-01	PB212
242.09	153.	17.29	1.10	2.302E-02	241.00	3.900	1.155E+00	RA224
					241.92	7.470	6.044E-01	PB214
270.58	77.	37.04	1.29	2.149E-02				
295.49	249.	10.55	1.22	2.024E-02	295.22	19.200	4.283E-01	PB214
300.64	98.	26.96	1.09	1.999E-02				
338.59	164.	12.89	1.17	1.829E-02	338.40	12.010	5.024E-01	AC228
352.18	429.	7.64	1.16	1.775E-02	351.99	37.100	4.360E-01	PB214
462.52	72.	27.54	1.16	1.427E-02				
462.52	72.	27.54	1.16	1.427E-02	463.51	10.000	3.398E-01	SB125
511.15	171.	13.23	1.39	1.316E-02	510.72	22.500	3.310E-01	TL208
583.55	337.	8.19	0.96	1.184E-02	583.14	86.000	2.218E-01	TL208
609.68	318.	7.35	1.47	1.143E-02	609.32	46.090	4.010E-01	BI214
726.90	101.	20.01	1.91	9.968E-03	727.17	11.800	5.813E-01	BI212
861.42	46.	29.26	1.65	8.761E-03				

911.85	230.	8.87	1.65	8.396E-03	911.07	29.000	6.314E-01	AC228
965.16	35.	38.47	1.54	8.056E-03	964.00	14.580	PBC<MDA	EU152
969.10	179.	12.72	1.45	8.025E-03	968.90	17.460	8.663E-01	AC228
1120.55	116.	18.05	1.58	7.211E-03	1120.28	15.040	7.115E-01	BI214
1461.71	1198.	2.98	2.00	5.929E-03	1460.75	10.700	1.261E+01	K40
1620.85	13.	32.61	0.64	5.488E-03	1620.56	2.750	5.737E-01	BI212

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
1765.54	62.	12.40	1.13	5.142E-03	1764.51	15.920	5.118E-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	
419.23	210.04	435.	120.	0.060	86.87	1.448	NP-239	s
540.32	270.58	305.	77.	0.038	111.12	1.293	AC-228	
600.43	300.64	240.	98.	0.049	80.88	1.093	PB-212	
1721.88	861.42	49.	46.	0.023	87.78	1.647	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	329.	109.	0.054	74.21	0.993D
PB-212	153.39	77.11	338.	118.	0.059	60.51	0.995A
CD-109	173.94	87.38	740.	104.	0.052	114.81	1.500
RA-226	371.89	186.37	664.	117.	0.058	87.59	1.500s
PB-212	476.96	238.90	537.	965.	0.483	14.86	1.015
RA-224	482.59	241.72	702.	136.	0.068	86.71	1.500
PB-214	590.13	295.49	206.	245.	0.123	31.66	1.216s
AC-228	676.32	338.59	135.	163.	0.081	38.66	1.167
PB-214	703.49	352.18	228.	423.	0.212	22.93	1.161
SB-125	925.56	463.22	117.	44.	0.022	109.29	1.500s
TL-208	1021.41	511.15	144.	145.	0.072	39.68	1.386s
TL-208	1166.21	583.55	133.	333.	0.166	24.56	0.957
BI-214	1218.45	609.68	94.	312.	0.156	22.06	1.465
BI-212	1452.88	726.90	86.	101.	0.050	60.03	1.915s
AC-228	1822.72	911.85	65.	227.	0.113	26.60	1.646
EU-152	1929.33	965.16	74.	35.	0.017	115.42	1.538s
AC-228	1937.22	969.10	87.	179.	0.089	38.16	1.453
BI-214	2240.08	1120.55	88.	114.	0.057	54.14	1.585s
K-40	2922.30	1461.71	42.	1179.	0.590	8.94	1.998
BI-212	3240.52	1620.85	2.	13.	0.006	97.82	0.645s
BI-214	3529.83	1765.54	3.	62.	0.031	37.21	1.125s

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		-5.6199E-02					
			477.56	-5.620E-02	%(	3.450E-01 1.02E-01	G
K-40		1.2610E+01					
			1460.75	1.261E+01	(P	3.508E-01 3.82E-01	G
MN-54		-7.7062E-04					
			834.81	-7.706E-04	&(P	3.134E-02 8.87E-03	G
CO-57		-2.2470E-04					
			122.07	-2.247E-04	%(P	4.477E-02 1.33E-02	G K
			136.43	4.544E-03	&	3.588E-01 1.07E-01	G
CO-60		4.8071E-03					
			1332.51	4.807E-03	&(P	3.129E-02 8.73E-03	G K
			1173.23	3.715E-03	& P	3.610E-02 1.02E-02	G K
Sr-85		-1.7487E-02					
			514.00	-1.749E-02	&(	4.023E-02 1.22E-02	G
Kr-85		-3.5686E+02					
			513.99	-3.569E+02	&(	8.143E+02 2.46E+02	G
Y-88		-9.3516E-05					
			1836.01	-9.352E-05	%(P	1.094E-02 1.49E-03	G K
			898.02	1.259E-03	% P	3.065E-02 8.58E-03	G
NB-94		6.5249E-03					
			871.10	6.525E-03	%(	2.655E-02 7.75E-03	G K
			702.50	-7.653E-03	%	3.248E-02 9.58E-03	G K
Ag-108M		2.3932E-03					
			722.95	2.393E-03	&(	5.100E-02 1.49E-02	G K
			614.37	-1.798E-02	% P	3.837E-02 1.16E-02	G
			433.93	-4.094E-03	%	2.948E-02 8.65E-03	G
CD-109		1.2893E+00					
			88.04	1.289E+00	(	1.605E+00 4.93E-01	G
SN-113		2.1024E-03					
			391.71	2.102E-03	%(	4.310E-02 1.26E-02	G K
			255.04	-9.560E-03	&	1.378E+00 4.05E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	5.8612E-02						
		427.95	6.447E-03	&(P	9.683E-02	2.83E-02	G K
		600.77	-2.546E-02	% P	1.679E-01	4.91E-02	G
		636.15	-3.977E-02	% P	2.219E-01	6.41E-02	G
		463.51	2.130E-01	@(P	2.547E-01	7.98E-02	G
		176.29	4.503E-02	%	5.039E-01	1.50E-01	G
I-131	-9.7625E-04						
		364.48	-9.762E-04	&(P	8.849E-02	2.56E-02	G K
		636.97	2.891E-01	&	9.030E-01	2.67E-01	G
		284.29	1.170E-02	& P	1.418E+00	4.18E-01	G
CS-134	7.7510E-03						
		604.66	7.751E-03	%(	1.938E-02	5.80E-03	G K
		795.76	2.380E-02	% P	3.462E-02	1.08E-02	G
		569.29	5.073E-02	% P	1.683E-01	4.97E-02	G
		801.84	8.065E-03	% P	3.255E-01	9.15E-02	G
CS-137	8.1718E-04						
		661.62	8.172E-04	%(P	3.505E-02	1.00E-02	G
CE-139	1.2390E-03						
		165.85	1.239E-03	%(	4.065E-02	1.21E-02	G
EU-152	6.0418E-02						
		121.78	-9.069E-03	%(P	1.281E-01	3.81E-02	G K
		344.30	1.773E-02	& P	9.846E-02	2.92E-02	G
		1408.08	6.762E-03	&	1.627E-01	4.54E-02	G
		964.00	1.998E-01	(P	2.477E-01	7.81E-02	G
		1112.07	3.378E-02	%	2.625E-01	7.56E-02	G
		778.90	3.086E-02	%	2.048E-01	5.91E-02	G
EU-154	-4.6771E-03						
		123.10	-4.677E-03	%(	9.808E-02	2.92E-02	G K
		1274.80	0.000E+00	&	1.130E-01	3.19E-02	G
		723.30	-6.327E-02	&	1.927E-01	5.76E-02	G
		1004.80	-5.489E-03	&	2.114E-01	6.03E-02	G
EU-155	1.2576E-02						
		86.45	1.258E-02	%(	2.148E-01	6.41E-02	G K
		105.31	-2.530E-02	%	2.173E-01	6.50E-02	G
HG-203	1.6728E-02						
		279.17	1.673E-02	%(P	3.724E-02	1.13E-02	G K
		72.87	2.313E-02	% P	2.222E+00	6.62E-01	G
		70.83	1.570E-02	&	3.168E+00	9.35E-01	G
		82.50	-8.586E-01	%	4.029E+00	1.21E+00	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	2.2181E-01						
		583.14	2.218E-01	(P	3.763E-02	1.84E-02	G
		510.72	3.310E-01	+ P	1.345E-01	5.19E-02	G
PB-212	6.5776E-01						
		238.63	6.552E-01	(P	7.513E-02	3.29E-02	G K
							Energy duplication
		77.11	4.516E-01	} P	3.388E-01	9.11E-02	G
		74.81	8.488E-01	+ P	6.817E-01	2.16E-01	G
PB-214	4.3337E-01						
		351.99	4.360E-01	(P	7.529E-02	3.38E-02	G K
		295.22	4.283E-01	@(P	1.214E-01	4.60E-02	G
							Energy duplication
		77.11	2.573E-01	} P	8.283E-01	1.96E-01	G
		241.92	3.685E-01	%	5.190E-01	1.59E-01	G
BI-212	5.7986E-01						
		727.17	5.813E-01	*(P	2.655E-01	1.17E-01	G K
		1620.56	5.737E-01	(P	4.359E-01	1.88E-01	G
		785.42	1.074E+00	%	1.484E+00	4.64E-01	G
BI-214	4.0104E-01						
		609.32	4.010E-01	(P	6.180E-02	3.01E-02	G K
		1764.51	5.118E-01	+ P	9.236E-02	6.69E-02	G
		1120.28	7.115E-01	+ P	2.910E-01	1.31E-01	G
RA-224	1.0241E+00						
		241.00	1.024E+00	(	9.518E-01	2.96E-01	G
RA-226	9.4004E-01						
		185.99	9.400E-01	(P	9.897E-01	3.05E-01	G
AC-228	6.3136E-01						
		911.07	6.314E-01	(P	1.125E-01	5.69E-02	G K
		968.90	8.663E-01	+ P	2.238E-01	1.10E-01	G
		338.40	5.024E-01	- P	1.757E-01	6.52E-02	G
TH-227	-1.4256E-01						
		236.00	-1.426E-01	&(	3.432E-01	1.04E-01	G K
		256.25	1.287E-01	% P	4.072E-01	1.22E-01	G
PA-234	-5.3755E-02						
		98.44	-5.376E-02	&(P	1.932E-01	5.81E-02	G K
		946.00	-8.774E-05	& P	2.289E-01	6.60E-02	G
		131.28	-5.999E-02	% P	1.974E-01	5.94E-02	G
		94.67	-9.805E-02	% P	3.667E-01	1.10E-01	G
		883.24	4.057E-02	&	2.349E-01	6.79E-02	G
		926.70	2.369E-02	%	2.138E-01	6.02E-02	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26 7.457E-02 % P 2.468E-01 7.29E-02 G

TH-234       2.6742E-01
                           63.29 2.674E-01 %(P 5.723E+00 1.70E+00 G K
                           92.80 1.179E+00 % P 1.885E+00 5.72E-01 G
                           92.38 1.363E+00 % P 2.253E+00 6.83E-01 G

AM-241       3.4056E-03
                           59.54 3.406E-03 &(P 8.933E-01 2.64E-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	-4.7859E-02	-5.6199E-02	3.0505E-01	3.0507E-01	2.938E-01
K-40		1.2610E+01	1.2610E+01	1.1450E+00	1.3590E+00	
MN-54	#A	-7.4973E-04	-7.7062E-04	5.6677E-02	5.6677E-02	3.049E-02
CO-57	#B	-2.1767E-04	-2.2470E-04	2.0159E-01	2.0159E-01	4.337E-02
CO-60	#B	4.7857E-03	4.8071E-03	2.6204E-02	2.6205E-02	3.115E-02

Sr-85	#A	-1.5320E-02	-1.7487E-02	3.6470E-02	3.6484E-02	3.525E-02
Kr-85	#A	-3.5683E+02	-3.5686E+02	7.3832E+02	7.3861E+02	8.142E+02
Y-88	#B	-8.6285E-05	-9.3516E-05	5.6110E-04	5.6112E-04	1.010E-02
NB-94	#B	6.5249E-03	6.5249E-03	2.3253E-02	2.3256E-02	2.655E-02
Ag-108M	#B	2.3927E-03	2.3932E-03	4.4764E-02	4.4764E-02	5.099E-02
CD-109	#A	1.2651E+00	1.2893E+00	1.4802E+00	1.4819E+00	1.575E+00
SN-113	#B	1.9514E-03	2.1024E-03	3.7691E-02	3.7691E-02	4.000E-02
SB-125	#B	5.8117E-02	5.8612E-02	6.5898E-02	6.5986E-02	9.602E-02
I-131	#B	-3.3589E-04	-9.7625E-04	1.0280E+01	1.0280E+01	3.045E-02
CS-134	#B	7.6632E-03	7.7510E-03	1.7406E-02	1.7412E-02	1.916E-02
CS-137	#A	8.1654E-04	8.1718E-04	3.0040E-02	3.0040E-02	3.502E-02
CE-139	#A	1.1640E-03	1.2390E-03	3.6203E-02	3.6203E-02	3.819E-02
EU-152	#B	6.0306E-02	6.0418E-02	7.0838E-02	7.0917E-02	1.279E-01
EU-154	#B	-4.6642E-03	-4.6771E-03	8.7706E-02	8.7706E-02	9.781E-02
EU-155	#B	1.2516E-02	1.2576E-02	1.9231E-01	1.9231E-01	2.137E-01
HG-203	#B	1.3915E-02	1.6728E-02	3.3810E-02	3.3824E-02	3.098E-02
TL-208		2.2181E-01	2.2181E-01	5.5187E-02	5.6670E-02	
PB-212		6.5776E-01	6.5776E-01	9.8929E-02	1.0604E-01	
PB-214		4.3337E-01	4.3337E-01	8.6014E-02	8.9619E-02	
BI-212		5.7986E-01	5.7986E-01	3.3406E-01	3.3575E-01	
BI-214		4.0104E-01	4.0104E-01	9.0308E-02	9.3262E-02	
RA-224	#	1.0241E+00	1.0241E+00	8.8798E-01	8.8997E-01	9.518E-01
RA-226	#A	9.4002E-01	9.4004E-01	9.1489E-01	9.1651E-01	9.896E-01
AC-228		6.3136E-01	6.3136E-01	1.7046E-01	1.7436E-01	
TH-227	#B	-1.4256E-01	-1.4256E-01	3.1146E-01	3.1157E-01	3.432E-01
PA-234	#B	-5.3755E-02	-5.3755E-02	1.8394E-01	1.8397E-01	1.932E-01
TH-234	#B	2.6742E-01	2.6742E-01	5.0959E+00	5.0959E+00	5.723E+00
AM-241	#A	3.4054E-03	3.4056E-03	7.9283E-01	7.9283E-01	8.932E-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) 1.5535592E+01 pCi/gm
Total Decayed Activity (86.9 to 2000.7 keV) 1.5535592E+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_8AUG2006_1943.An1

Sample description
FSS-OOL-10-04-003-F

Spectrum Filename: C:\GammaVision\Spectra\103F_8AUG2006_1943.An1

Acquisition information
Start time: 08-Aug-2006 19:43:58
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: 2.0380E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 2.0380E+03) =
4.9068E+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	27-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. 17 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.2748

***** 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	91.	27.37	0.99	9.052E-03	74.81	9.600	6.928E-01	PB212
77.30	108.	19.69	0.99	1.011E-02	77.11	17.500	5.364E-01	PB212
					77.11	10.700	8.773E-01	PB214
93.19	87.	38.34	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
93.20	87.	38.42	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
186.20	162.	22.33	1.31	2.566E-02	185.99	3.280	1.176E+00	RA226
209.62	87.	30.26	1.01	2.470E-02				
238.83	865.	4.07	1.09	2.319E-02	238.63	43.100	5.660E-01	PB212
241.77	141.	16.34	1.09	2.303E-02	241.00	3.900	1.041E+00	RA224
					241.92	7.470	5.445E-01	PB214
295.48	223.	12.41	0.97	2.024E-02	295.22	19.200	3.738E-01	PB214
338.48	181.	12.79	1.30	1.830E-02	338.40	12.010	5.415E-01	AC228
352.19	423.	6.83	1.19	1.774E-02	351.99	37.100	4.202E-01	PB214
463.22	66.	28.72	0.73	1.425E-02				
463.22	66.	28.72	0.73	1.425E-02	463.51	10.000	3.062E-01	SB125
510.92	112.	19.25	1.39	1.317E-02	510.72	22.500	1.909E-01	TL208
583.44	289.	8.12	1.20	1.184E-02	583.14	86.000	1.851E-01	TL208
609.61	341.	8.03	1.26	1.143E-02	609.32	46.090	4.207E-01	BI214
727.79	85.	18.87	1.52	9.958E-03	727.17	11.800	4.754E-01	BI212
911.70	215.	9.34	1.41	8.397E-03	911.07	29.000	5.763E-01	AC228
965.34	38.	26.61	1.54	8.048E-03	964.00	14.580	2.132E-01	EU152
969.53	139.	10.32	1.54	8.022E-03	968.90	17.460	6.576E-01	AC228
1120.88	93.	18.48	2.23	7.209E-03	1120.28	15.040	5.563E-01	BI214

1461.60	969.	3.27	1.90	5.929E-03	1460.75	10.700	9.931E+00	K40

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
1765.54	62.	13.29	2.49	5.142E-03	1764.51	15.920	5.025E-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	
418.39	209.62	303.	87.	0.043	90.78	1.014	NP-239	
1930.89	965.35	38.	32.	0.016	96.70	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.	91.	0.045	82.10	0.993D
PB-212	153.39	77.11	300.	108.	0.054	59.07	0.995A
RA-226	371.55	186.20	492.	149.	0.075	66.98	1.314s
PB-212	476.81	238.83	653.	784.	0.392	18.94	0.990
RA-224	483.04	241.94	532.	128.	0.064	80.71	1.500
PB-214	482.95	241.90	588.	101.	0.051	105.99	1.500
PB-214	590.11	295.48	231.	219.	0.110	37.24	0.966
AC-228	676.10	338.48	154.	180.	0.090	38.37	1.303
PB-214	703.53	352.19	171.	417.	0.209	20.50	1.192
SB-125	926.00	463.44	120.	45.	0.022	109.48	1.500s
TL-208	1020.96	510.92	153.	85.	0.043	57.75	1.394s
TL-208	1165.97	583.44	86.	284.	0.142	24.36	1.198
BI-214	1218.31	609.61	126.	335.	0.167	24.08	1.261
BI-212	1454.64	727.79	62.	84.	0.042	56.62	1.524
AC-228	1822.43	911.70	64.	212.	0.106	28.03	1.406
EU-152	1929.76	965.37	51.	30.	0.015	113.01	1.538
AC-228	1936.81	968.90	33.	139.	0.069	30.96	1.541D
BI-214	2240.74	1120.88	67.	91.	0.046	55.44	2.229s
K-40	2922.07	1461.60	28.	951.	0.475	9.80	1.896
BI-214	3529.83	1765.54	6.	62.	0.031	39.86	2.492s

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	%(	3.074E-01 8.88E-02	G
K-40		9.9315E+00					
			1460.75	9.931E+00	(P	2.874E-01 3.31E-01	G
MN-54		-9.3447E-03					
			834.81	-9.345E-03	&(P	3.390E-02 9.99E-03	G
CO-57		3.5873E-03					
			122.07	3.587E-03	%(P	4.201E-02 1.25E-02	G K
			136.43	2.784E-02	%	3.285E-01 9.79E-02	G
CO-60		-2.2748E-03					
			1332.51	-2.275E-03	%(P	2.464E-02 6.20E-03	G K
			1173.23	1.481E-02	% P	2.864E-02 8.65E-03	G K
Sr-85		-1.5420E-02					
			514.00	-1.542E-02	&(	4.105E-02 1.23E-02	G
Kr-85		-3.1182E+02					
			513.99	-3.118E+02	&(	8.300E+02 2.50E+02	G
Y-88		9.7682E-04					
			1836.01	9.768E-04	%(P	2.150E-02 5.45E-03	G K
			898.02	5.867E-03	& P	3.268E-02 9.43E-03	G
NB-94		-1.6752E-03					
			871.10	-1.675E-03	&(	2.699E-02 7.65E-03	G K
			702.50	-1.050E-03	&	2.901E-02 8.31E-03	G K
Ag-108M		1.5587E-03					
			722.95	1.559E-03	&(	5.241E-02 1.53E-02	G K
			614.37	-1.665E-02	% P	3.613E-02 1.09E-02	G
			433.93	2.590E-03	%	2.925E-02 8.55E-03	G
CD-109		8.0105E-01					
			88.04	8.011E-01	%(	1.526E+00 4.64E-01	G
SN-113		-3.7640E-03					
			391.71	-3.764E-03	&(	4.394E-02 1.29E-02	G K
			255.04	-1.837E-01	%	1.326E+00 3.93E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	6.5430E-02						
		427.95	1.630E-02	%(P	9.086E-02	2.68E-02	G K
		600.77	3.825E-02	% P	1.325E-01	3.92E-02	G
		636.15	-1.774E-02	& P	2.187E-01	6.23E-02	G
		463.51	2.109E-01	(P	2.526E-01	7.91E-02	G
		176.29	-1.457E-02	&	4.526E-01	1.34E-01	G
I-131	-9.4215E-04						
		364.48	-9.421E-04	&(P	9.341E-02	2.72E-02	G K
		636.97	1.421E-03	&	1.077E+00	3.07E-01	G
		284.29	2.812E-01	% P	1.251E+00	3.73E-01	G
CS-134	0.0000E+00						
		604.66	0.000E+00	%(	5.083E-02	1.49E-02	G K
		795.76	1.642E-02	% P	3.091E-02	9.45E-03	G
		569.29	-3.383E-02	% P	1.748E-01	5.06E-02	G
		801.84	-1.211E-03	% P	2.510E-01	6.85E-02	G
CS-137	1.4912E-02						
		661.62	1.491E-02	%(P	3.457E-02	1.04E-02	G
CE-139	-6.9191E-03						
		165.85	-6.919E-03	%(	3.745E-02	1.12E-02	G
EU-152	6.2543E-02						
		121.78	9.443E-03	%(P	1.265E-01	3.77E-02	G K
		344.30	-1.395E-04	& P	9.328E-02	2.72E-02	G
		1408.08	4.388E-02	%	1.129E-01	3.36E-02	G
		964.00	1.690E-01	?(P	2.036E-01	6.48E-02	G
		1112.07	1.673E-02	%	2.087E-01	5.87E-02	G
		778.90	2.908E-02	&	2.058E-01	5.93E-02	G
EU-154	1.2104E-02						
		123.10	1.210E-02	%(	8.889E-02	2.66E-02	G K
		1274.80	-1.051E-02	&	1.100E-01	3.15E-02	G
		723.30	-6.869E-02	&	1.830E-01	5.49E-02	G
		1004.80	4.262E-02	&	1.301E-01	3.83E-02	G
EU-155	8.5228E-02						
		86.45	8.523E-02	%(	1.933E-01	5.85E-02	G K
		105.31	2.110E-02	%	1.928E-01	5.75E-02	G
HG-203	6.2689E-03						
		279.17	6.269E-03	&(P	4.039E-02	1.20E-02	G K
		72.87	-6.961E-01	& P	2.129E+00	6.42E-01	G
		70.83	3.689E-01	%	3.984E+00	1.19E+00	G
		82.50	-9.635E-01	%	3.600E+00	1.08E+00	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	1.8627E-01						
		583.14	1.851E-01	(P	2.985E-02	1.53E-02	G
		510.72	1.909E-01	*(P	1.349E-01	4.82E-02	G
PB-212	5.2475E-01						
		238.63	5.200E-01	(P	8.076E-02	3.33E-02	G K
							Energy duplication
		77.11	4.029E-01	} P	3.124E-01	7.93E-02	G
		74.81	6.928E-01	+ P	6.223E-01	1.96E-01	G
PB-214	4.0266E-01						
		351.99	4.202E-01	(P	6.401E-02	2.91E-02	G K
		295.22	3.738E-01	(P	1.254E-01	4.73E-02	G
							Energy duplication
		77.11	0.000E+00	} P	7.409E-01	0.00E+00	G
		241.92	3.899E-01	(	4.460E-01	1.38E-01	G
BI-212	4.7541E-01						
		727.17	4.754E-01	(P	2.217E-01	9.03E-02	G K
		1620.56	-2.629E-03	% P	7.206E-01	1.82E-01	G
		785.42	3.951E-01	%	1.246E+00	3.68E-01	G
BI-214	4.4170E-01						
		609.32	4.207E-01	(P	6.932E-02	3.44E-02	G K
		1764.51	5.025E-01	@(P	1.142E-01	7.03E-02	G
		1120.28	5.563E-01	+ P	2.497E-01	1.05E-01	G
RA-224	9.4556E-01						
		241.00	9.456E-01	&(	8.118E-01	2.54E-01	G
RA-226	1.1755E+00						
		185.99	1.176E+00	*(P	8.353E-01	2.85E-01	G
AC-228	5.9320E-01						
		911.07	5.763E-01	(P	1.090E-01	5.47E-02	G K
		968.90	6.569E-01	(P	1.404E-01	6.79E-02	G
		338.40	5.415E-01	(P	1.829E-01	6.97E-02	G
TH-227	-5.0382E-02						
		236.00	-5.038E-02	%(	3.004E-01	8.98E-02	G K
		256.25	-3.975E-03	% P	3.808E-01	1.12E-01	G
PA-234	2.0831E-02						
		98.44	2.083E-02	%(P	1.762E-01	5.25E-02	G K
		946.00	-2.388E-02	& P	1.397E-01	4.03E-02	G
		131.28	5.118E-03	% P	1.811E-01	5.39E-02	G
		94.67	-1.152E-02	% P	3.230E-01	9.61E-02	G
		883.24	5.124E-02	%	2.178E-01	6.35E-02	G
		926.70	5.813E-02	%	2.077E-01	6.07E-02	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26-5.289E-02 % P 2.572E-01 7.47E-02 G

TH-234      -1.6292E+00
                           63.29-1.629E+00 &(P 5.106E+00 1.53E+00 G K
                           92.80 1.170E+00 % P 1.776E+00 5.40E-01 G
                           92.38 1.380E+00 & P 2.098E+00 6.37E-01 G

AM-241      -1.0260E-02
                           59.54-1.026E-02 &(P 9.082E-01 2.69E-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	2.6649E-01	2.6649E-01	2.617E-01
K-40		9.9315E+00	9.9315E+00	9.9207E-01	1.1475E+00	
MN-54	#A	-9.0908E-03	-9.3447E-03	3.1775E-02	3.1780E-02	3.298E-02
CO-57	#B	3.4749E-03	3.5873E-03	3.7552E-02	3.7552E-02	4.070E-02
CO-60	#B	-2.2646E-03	-2.2748E-03	1.8720E-01	1.8720E-01	2.453E-02

Sr-85	#A	-1.3505E-02	-1.5420E-02	3.7042E-02	3.7053E-02	3.595E-02
Kr-85	#A	-3.1179E+02	-3.1182E+02	7.4899E+02	7.4921E+02	8.299E+02
Y-88	#B	9.0111E-04	9.7682E-04	1.6353E-02	1.6353E-02	1.983E-02
NB-94	#B	-1.6752E-03	-1.6752E-03	2.2943E-02	2.2943E-02	2.699E-02
Ag-108M	#B	1.5584E-03	1.5587E-03	4.6018E-02	4.6018E-02	5.240E-02
CD-109	#A	7.8600E-01	8.0105E-01	1.3916E+00	1.3923E+00	1.498E+00
SN-113	#B	-3.4930E-03	-3.7640E-03	3.8621E-02	3.8622E-02	4.078E-02
SB-125	#B	6.4876E-02	6.5430E-02	7.3668E-02	7.3765E-02	9.009E-02
I-131	#B	-3.2326E-04	-9.4215E-04	1.1152E-01	1.1152E-01	3.205E-02
CS-134	#B	0.0000E+00	0.0000E+00	4.4800E-02	4.4800E-02	5.025E-02
CS-137	#A	1.4901E-02	1.4912E-02	3.1177E-02	3.1189E-02	3.455E-02
CE-139	#A	-6.4995E-03	-6.9191E-03	3.3579E-02	3.3581E-02	3.518E-02
EU-152	#B	6.2427E-02	6.2543E-02	7.1970E-02	7.2054E-02	1.262E-01
EU-154	#B	1.2070E-02	1.2104E-02	7.9693E-02	7.9696E-02	8.865E-02
EU-155	#B	8.4824E-02	8.5228E-02	1.7557E-01	1.7564E-01	1.923E-01
HG-203	#B	5.2122E-03	6.2689E-03	3.5991E-02	3.5992E-02	3.358E-02
TL-208		1.8627E-01	1.8627E-01	4.6059E-02	4.7311E-02	
PB-212		5.2475E-01	5.2475E-01	1.0091E-01	1.0541E-01	
PB-214		4.0266E-01	4.0266E-01	8.3661E-02	8.6866E-02	
BI-212		4.7541E-01	4.7541E-01	2.7077E-01	2.7217E-01	
BI-214		4.4170E-01	4.4170E-01	1.0737E-01	1.1039E-01	
RA-224	#	9.4556E-01	9.4556E-01	7.6314E-01	7.6511E-01	8.118E-01
RA-226	#	1.1755E+00	1.1755E+00	8.5567E-01	8.5839E-01	
AC-228		5.9320E-01	5.9320E-01	1.1292E-01	1.1806E-01	
TH-227	#B	-5.0382E-02	-5.0382E-02	2.6935E-01	2.6937E-01	3.004E-01
PA-234	#B	2.0831E-02	2.0831E-02	1.5765E-01	1.5765E-01	1.762E-01
TH-234	#B	-1.6292E+00	-1.6292E+00	6.0806E+00	6.0812E+00	5.106E+00
AM-241	#A	-1.0259E-02	-1.0260E-02	1.1084E+00	1.1084E+00	9.081E-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) 1.3730960E+01 pCi/gm
Total Decayed Activity (1120.0 to 2000.7 keV) 1.3730977E+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_14AUG2006_0923.An1

Sample description
FSS-OOL-10-04-024-F

Spectrum Filename: C:\GammaVision\Spectra\103F_14AUG2006_0923.An1

Acquisition information

Start time:	07-Aug-2006 09:23:42
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:	1.8520E+03
Activity scaling factor:	1.0000E+06/(1.0000E+00* 1.8520E+03) = 5.3996E+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	27-Jul-2006 08:08:00
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: 0.1155

***** 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	147.	20.73	0.99	9.056E-03	74.81	9.600	1.209E+00	PB212
77.27	237.	13.24	0.99	1.020E-02	77.11	17.500	9.642E-01	PB212
					77.11	10.700	1.577E+00	PB214
87.36	92.	38.67	1.17	1.446E-02	86.45	32.740	1.460E-01	EU155
					88.04	3.790	1.224E+00	CD109
93.59	119.	30.96	1.20	1.672E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
					94.67	15.500	PBC<MDA	PA234
128.98	101.	35.63	0.85	2.436E-02				
186.06	155.	26.05	1.16	2.566E-02	185.99	3.280	1.229E+00	RA226
209.45	152.	27.16	1.13	2.471E-02				
238.73	1176.	3.41	1.09	2.320E-02	238.63	43.100	8.495E-01	PB212
242.04	192.	14.18	1.10	2.302E-02	241.00	3.900	1.556E+00	RA224
					241.92	7.470	8.142E-01	PB214
270.05	81.	32.52	1.15	2.152E-02				
295.25	289.	9.87	0.98	2.025E-02	295.22	19.200	5.352E-01	PB214
300.27	68.	31.27	1.10	2.000E-02				
327.81	51.	37.18	1.17	1.875E-02				
338.36	242.	11.20	1.04	1.830E-02	338.40	12.010	7.984E-01	AC228
352.02	489.	6.94	1.22	1.775E-02	351.99	37.100	5.359E-01	PB214
408.84	75.	27.57	1.04	1.577E-02				
463.38	116.	21.88	1.41	1.425E-02				
463.38	116.	21.88	1.41	1.425E-02	463.51	10.000	5.921E-01	SB125
510.96	146.	17.22	1.16	1.317E-02	510.72	22.500	2.938E-01	TL208
583.34	389.	7.47	1.47	1.184E-02	583.14	86.000	2.756E-01	TL208
609.49	362.	6.74	1.05	1.144E-02	609.32	46.090	4.920E-01	BI214
661.83	115.	17.40	1.57	1.072E-02	661.62	84.620	9.159E-02	CS137

727.70	97.	18.77	1.47	9.959E-03	727.17	11.800	6.014E-01	BI212
768.48	71.	23.84	1.01	9.552E-03				
785.43	34.	40.56	1.50	9.394E-03	785.42	2.000	PBC<MDA	BI212
795.24	54.	30.15	1.40	9.306E-03				
795.24	54.	30.15	1.40	9.306E-03	795.76	85.400	4.985E-02	CS134
861.61	65.	25.50	1.06	8.759E-03				
911.30	281.	9.03	1.70	8.400E-03	911.07	29.000	8.309E-01	AC228
964.88	37.	38.04	1.54	8.056E-03	964.00	14.580	PBC<MDA	EU152
968.94	235.	10.19	1.58	8.026E-03	968.90	17.460	1.225E+00	AC228

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
1120.29	144.	14.77	1.48	7.212E-03	1120.28	15.040	9.580E-01	BI214
1461.13	1271.	2.94	1.89	5.931E-03	1460.75	10.700	1.440E+01	K40
1764.92	88.	11.41	1.73	5.141E-03	1764.51	15.920	7.544E-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	
418.05	209.45	621.	152.	0.076	81.48	1.131	AC-228	
539.25	270.05	277.	81.	0.040	97.57	1.146	AC-228	
599.68	300.27	192.	68.	0.034	93.80	1.103	PB-212	
654.77	327.81	164.	51.	0.026	111.55	1.173	AC-228	
816.82	408.84	155.	75.	0.038	82.72	1.044	CS-138	s
1536.02	768.48	74.	71.	0.035	71.53	1.012	BI-214	sM
1722.27	861.61	67.	65.	0.032	76.51	1.062	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	396.	142.	0.071	63.22	0.993D
PB-212	153.39	77.11	376.	165.	0.083	45.18	0.995A
EU-155	173.72	87.27	983.	131.	0.066	104.57	1.500
CD-109	173.80	87.31	894.	130.	0.065	100.92	1.500
TH-234	186.02	93.42	949.	111.	0.055	104.42	1.500s
TH-234	185.99	93.41	990.	111.	0.056	106.05	1.500s
PA-234	185.96	93.39	744.	127.	0.064	94.51	1.500s
RA-226	371.47	186.16	775.	153.	0.076	74.50	1.500s
PB-212	476.70	238.77	874.	1012.	0.506	16.96	1.068
RA-224	482.67	241.76	688.	201.	0.100	59.39	1.500
PB-214	483.11	241.98	413.	76.	0.038	115.97	1.261
PB-214	589.66	295.25	243.	285.	0.143	29.61	0.978
AC-228	675.87	338.36	205.	241.	0.120	33.60	1.041
PB-214	703.18	352.02	243.	484.	0.242	20.83	1.219
SB-125	925.67	463.27	152.	96.	0.048	61.28	1.500
TL-208	1021.03	510.96	189.	119.	0.060	51.66	1.157s
TL-208	1165.78	583.34	156.	385.	0.192	22.42	1.466
BI-214	1218.08	609.49	99.	356.	0.178	20.21	1.048

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
CS-137	1322.75	661.83	100.	114.	0.057	52.20	1.575s
BI-212	1454.46	727.70	85.	97.	0.048	56.31	1.466s
BI-212	1569.92	785.43	76.	34.	0.017	121.69	1.500
CS-134	1589.75	795.35	54.	45.	0.023	81.81	1.500
AC-228	1821.63	911.30	99.	277.	0.139	27.08	1.701
EU-152	1928.77	964.88	86.	37.	0.019	114.13	1.538
AC-228	1936.90	968.94	90.	235.	0.118	30.58	1.577
BI-214	2239.55	1120.29	86.	142.	0.071	44.30	1.482s
K-40	2921.12	1461.13	48.	1253.	0.626	8.83	1.889
BI-214	3528.60	1764.92	6.	85.	0.042	34.23	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		1.3631E-01					
			477.56	1.363E-01	%(	3.272E-01 9.86E-02	G
K-40		1.4399E+01					
			1460.75	1.440E+01	(P	4.039E-01 4.30E-01	G
MN-54		-2.9830E-04					
			834.81	-2.983E-04	%(P	3.938E-02 1.12E-02	G
CO-57		-2.5141E-03					
			122.07	-2.514E-03	&(P	4.773E-02 1.42E-02	G K
			136.43	3.750E-02	%	4.110E-01 1.23E-01	G
CO-60		4.7061E-03					
			1332.51	4.706E-03	%(P	3.753E-02 1.05E-02	G K
			1173.23	1.513E-02	% P	4.067E-02 1.21E-02	G K
Sr-85		-2.1968E-02					
			514.00	-2.197E-02	&(	4.852E-02 1.47E-02	G
Kr-85		-4.5066E+02					
			513.99	-4.507E+02	&(	9.955E+02 3.01E+02	G
Y-88		-3.8960E-03					
			1836.01	-3.896E-03	&(P	3.167E-02 8.65E-03	G K
			898.02	-4.877E-04	% P	3.427E-02 9.54E-03	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
NB-94	0.0000E+00						
		871.10	0.000E+00	%(	4.404E-02	1.27E-02	G K
		702.50	1.109E-02	%	3.584E-02	1.07E-02	G K
Ag-108M	-1.5142E-02						
		722.95	-1.514E-02	%(	4.890E-02	1.46E-02	G K
		614.37	-1.081E-02	& P	4.218E-02	1.25E-02	G
		433.93	-1.319E-02	%	3.691E-02	1.11E-02	G
CD-109	1.7314E+00						
		88.04	1.731E+00	(	1.889E+00	5.82E-01	G
SN-113	-6.8647E-03						
		391.71	-6.865E-03	%(	5.792E-02	1.71E-02	G K
		255.04	-5.387E-01	%	1.788E+00	5.37E-01	G
SB-125	1.2574E-01						
		427.95	1.135E-04	%(P	1.015E-01	2.94E-02	G K
		600.77	1.493E-02	% P	1.888E-01	5.49E-02	G
		636.15	5.294E-02	& P	3.178E-01	9.31E-02	G
		463.51	4.976E-01	(P	3.101E-01	1.03E-01	G
		176.29	1.058E-02	%	5.509E-01	1.64E-01	G
I-131	-8.2059E-03						
		364.48	-8.206E-03	&(P	9.646E-02	2.83E-02	G K
		636.97	1.544E-01	%	1.202E+00	3.51E-01	G
		284.29	-2.076E-02	% P	1.518E+00	4.48E-01	G
CS-134	1.6611E-02						
		604.66	-5.575E-03	%(	3.776E-02	1.11E-02	G K
		795.76	4.197E-02	(P	3.422E-02	1.15E-02	G
		569.29	-7.092E-03	& P	2.324E-01	6.69E-02	G
		801.84	-5.222E-03	% P	4.532E-01	1.29E-01	G
CS-137	9.1593E-02						
		661.62	9.159E-02	(P	3.972E-02	1.61E-02	G
CE-139	-1.0282E-03						
		165.85	-1.028E-03	%(	4.597E-02	1.37E-02	G
EU-152	6.7517E-02						
		121.78	-1.479E-02	%(P	1.318E-01	3.93E-02	G K
		344.30	-5.097E-03	% P	1.137E-01	3.34E-02	G
		1408.08	6.761E-02	%	1.321E-01	4.05E-02	G
		964.00	2.326E-01	(P	2.852E-01	8.98E-02	G
		1112.07	1.023E-01	&	2.747E-01	8.20E-02	G
		778.90	1.848E-02	&	2.500E-01	7.17E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
EU-154	-1.7204E-02						
		123.10	-1.720E-02	&(	1.091E-01	3.27E-02	G K
		1274.80	-1.428E-03	%	1.310E-01	3.72E-02	G
		723.30	3.950E-03	%	3.162E-01	9.30E-02	G
		1004.80	-1.805E-02	%	1.796E-01	5.11E-02	G
EU-155	2.0844E-01						
		86.45	2.084E-01	(	2.361E-01	7.27E-02	G K
		105.31	3.235E-04	&	2.264E-01	6.73E-02	G
HG-203	-8.9457E-03						
		279.17	-8.946E-03	&(P	5.284E-02	1.58E-02	G K
		72.87	-1.606E-01	% P	2.455E+00	7.33E-01	G
		70.83	1.076E-01	%	4.888E+00	1.46E+00	G
		82.50	-6.648E-01	&	4.581E+00	1.37E+00	G
TL-208	2.7934E-01						
		583.14	2.756E-01	(P	4.367E-02	2.08E-02	G
		510.72	2.938E-01	*(P	1.643E-01	6.19E-02	G
PB-212	7.3862E-01						
		238.63	7.386E-01	(P	1.025E-01	4.22E-02	G K
							Energy duplication
		77.11	6.809E-01	} P	3.839E-01	1.03E-01	G
		74.81	1.190E+00	+ P	8.017E-01	2.56E-01	G
PB-214	5.3568E-01						
		351.99	5.359E-01	(P	8.352E-02	3.76E-02	G K
		295.22	5.352E-01	(P	1.414E-01	5.36E-02	G
							Energy duplication
		77.11	4.387E-01	} P	9.409E-01	2.29E-01	G
		241.92	3.220E-01	-	4.134E-01	1.24E-01	G
BI-212	6.0135E-01						
		727.17	6.014E-01	*(P	2.836E-01	1.14E-01	G K
		1620.56	3.666E-01	% P	9.154E-01	2.73E-01	G
		785.42	1.306E+00	+	1.685E+00	5.30E-01	G
BI-214	4.9204E-01						
		609.32	4.920E-01	(P	6.807E-02	3.38E-02	G K
		1764.51	7.544E-01	+ P	1.290E-01	8.94E-02	G
		1120.28	9.580E-01	+ P	3.083E-01	1.43E-01	G
RA-224	1.6262E+00						
		241.00	1.626E+00	(	1.013E+00	3.22E-01	G
RA-226	1.3226E+00						
		185.99	1.323E+00	(P	1.148E+00	3.56E-01	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments

AC-228       8.2138E-01
                          911.07 8.309E-01  (P 1.467E-01 7.59E-02 G K
                          968.90 1.225E+00 + P 2.440E-01 1.25E-01 G
                          338.40 7.984E-01  (P 2.308E-01 8.98E-02 G

TH-227       7.2608E-02
                          236.00 7.261E-02 %(  2.589E-01 7.76E-02 G K
                          256.25-6.873E-03 % P 4.852E-01 1.43E-01 G

PA-234       1.1126E-01
                           98.44-3.652E-02 %(P 2.337E-01 7.00E-02 G K
                          946.00 2.065E-02 % P 1.808E-01 5.21E-02 G
                          131.28-5.256E-02 % P 2.268E-01 6.82E-02 G
                           94.67 3.506E-01 &(P 3.577E-01 1.11E-01 G
                          883.24 1.232E-02 &   2.683E-01 7.62E-02 G
                          926.70-3.453E-02 &   3.061E-01 8.79E-02 G
                          569.26-1.057E-02 & P 3.519E-01 1.01E-01 G

TH-234       9.3707E-01
                           63.29-2.568E-01 &(P 6.261E+00 1.85E+00 G K
                           92.80 1.643E+00 *(P 2.208E+00 6.73E-01 G
                           92.38 1.924E+00 &(P 2.546E+00 7.77E-01 G

AM-241       1.2537E-01
                           59.54 1.254E-01 &(P 1.123E+00 3.35E-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
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	1.1809E-01	1.3631E-01	2.9588E-01	2.9599E-01	2.835E-01
K-40		1.4399E+01	1.4399E+01	1.2900E+00	1.5372E+00	
MN-54	#A	-2.9107E-04	-2.9830E-04	2.4135E-02	2.4135E-02	3.843E-02
CO-57	#B	-2.4438E-03	-2.5141E-03	4.8450E-02	4.8450E-02	4.639E-02
CO-60	#B	4.6874E-03	4.7061E-03	3.1596E-02	3.1597E-02	3.738E-02
Sr-85	#A	-1.9520E-02	-2.1968E-02	4.4061E-02	4.4079E-02	4.312E-02
Kr-85	#A	-4.5062E+02	-4.5066E+02	9.0389E+02	9.0427E+02	9.954E+02
Y-88	#B	-3.6259E-03	-3.8960E-03	2.7300E-02	2.7300E-02	2.948E-02
NB-94	#B	0.0000E+00	0.0000E+00	3.8020E-02	3.8020E-02	4.404E-02
Ag-108M	#B	-1.5139E-02	-1.5142E-02	4.3809E-02	4.3817E-02	4.890E-02
CD-109	#A	1.7024E+00	1.7314E+00	1.7473E+00	1.7500E+00	1.857E+00
SN-113	#B	-6.4227E-03	-6.8647E-03	5.1348E-02	5.1349E-02	5.419E-02
SB-125	#F	1.2480E-01	1.2574E-01	7.8081E-02	7.8422E-02	1.007E-01
I-131	#B	-3.1645E-03	-8.2059E-03	1.0639E-01	1.0639E-01	3.720E-02
CS-134	#B	1.6443E-02	1.6611E-02	1.3616E-02	1.3650E-02	3.737E-02
CS-137	#	9.1529E-02	9.1593E-02	4.8390E-02	4.8681E-02	
CE-139	#A	-9.7247E-04	-1.0282E-03	4.0982E-02	4.0982E-02	4.348E-02
EU-152	#B	6.7406E-02	6.7517E-02	7.8182E-02	7.8271E-02	1.316E-01
EU-154	#B	-1.7162E-02	-1.7204E-02	9.8011E-02	9.8016E-02	1.088E-01
EU-155	#A	2.0756E-01	2.0844E-01	2.1798E-01	2.1828E-01	2.351E-01
HG-203	#B	-7.5893E-03	-8.9457E-03	4.7503E-02	4.7506E-02	4.483E-02
TL-208		2.7934E-01	2.7934E-01	6.3324E-02	6.5367E-02	
PB-212		7.3862E-01	7.3862E-01	1.2674E-01	1.3380E-01	
PB-214		5.3568E-01	5.3568E-01	9.8254E-02	1.0306E-01	
BI-212		6.0135E-01	6.0135E-01	3.4037E-01	3.4216E-01	
BI-214		4.9204E-01	4.9204E-01	1.0123E-01	1.0519E-01	
RA-224		1.6262E+00	1.6262E+00	9.6572E-01	9.7032E-01	1.013E+00
RA-226	#	1.3226E+00	1.3226E+00	1.0689E+00	1.0717E+00	1.148E+00
AC-228		8.2138E-01	8.2138E-01	1.7857E-01	1.8483E-01	
TH-227	#B	7.2608E-02	7.2608E-02	2.3275E-01	2.3279E-01	2.589E-01
PA-234	#B	1.1126E-01	1.1126E-01	1.0543E-01	1.0561E-01	2.337E-01
TH-234	#B	9.3707E-01	9.3707E-01	1.1347E+00	1.1359E+00	6.261E+00
AM-241	#A	1.2536E-01	1.2537E-01	1.0050E+00	1.0050E+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) 1.9585621E+01 pCi/gm
Total Decayed Activity (86.9 to 2000.7 keV) 1.9585686E+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_31JULY2006_1633.An1

Sample description
OOL-10-04-011-F

Spectrum Filename: C:\GammaVision\Spectra\103F_31JULY2006_1633.An1

Acquisition information
Start time: 31-Jul-2006 16:34:55
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: 1.9840E+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	27-Jul-2006 08:28:00
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: 0.1742

***** 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	114.	22.87	0.99	9.100E-03	74.81	9.600	8.696E-01	PB212
77.42	176.	16.58	0.99	1.039E-02	77.11	17.500	6.653E-01	PB212
					77.11	10.700	1.088E+00	PB214
92.12	124.	34.09	1.57	1.622E-02				
92.12	124.	34.09	1.57	1.622E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
186.15	127.	24.23	1.33	2.566E-02	185.99	3.280	PBC<MDA	RA226
210.07	117.	24.45	1.17	2.468E-02				
238.92	1053.	3.66	1.09	2.319E-02	238.63	43.100	7.088E-01	PB212
242.20	147.	16.20	1.10	2.301E-02	241.92	7.470	5.821E-01	PB214
270.50	125.	24.87	1.21	2.150E-02				
295.22	238.	12.78	0.84	2.025E-02	295.22	19.200	4.106E-01	PB214
327.90	83.	22.83	1.19	1.875E-02				
338.28	206.	15.64	1.13	1.831E-02	338.40	12.010	6.356E-01	AC228
351.98	407.	8.11	1.06	1.775E-02	351.99	37.100	4.155E-01	PB214
462.74	62.	24.28	1.34	1.427E-02				
462.74	62.	24.28	1.34	1.427E-02	463.51	10.000	2.907E-01	SB125
510.78	164.	16.85	1.43	1.317E-02	510.72	22.500	3.167E-01	TL208
583.31	350.	8.54	1.27	1.184E-02	583.14	86.000	2.312E-01	TL208
609.48	327.	7.09	1.39	1.144E-02	609.32	46.090	4.141E-01	BI214
662.06	64.	27.92	0.77	1.072E-02	661.62	84.620	4.717E-02	CS137
727.76	67.	24.96	1.17	9.959E-03	727.17	11.800	3.841E-01	BI212
795.33	35.	36.00	1.50	9.301E-03	795.76	85.400	PBC<MDA	CS134
860.97	55.	29.26	1.10	8.764E-03				
911.54	243.	8.85	1.95	8.398E-03	911.07	29.000	6.708E-01	AC228
965.13	29.	36.33	1.54	8.048E-03				
969.16	112.	12.28	1.54	8.023E-03	968.90	17.460	5.417E-01	AC228

1121.02	93.	17.61	1.97	7.208E-03	1120.28	15.040	5.734E-01	BI214
1461.27	1078.	3.11	1.94	5.930E-03	1460.75	10.700	1.137E+01	K40
1764.93	50.	13.74	1.18	5.142E-03	1764.51	15.920	4.138E-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	
183.41	92.12	693.	124.	0.062	102.28	1.568	PB-214	l
419.30	210.07	337.	117.	0.059	73.36	1.171	NP-239	s
540.15	270.50	311.	125.	0.062	74.61	1.210	AC-228	s
654.95	327.90	138.	83.	0.041	68.48	1.186	AC-228	
1720.97	860.97	68.	55.	0.028	75.38	1.101	TL-208	
1929.99	965.26	40.	26.	0.013	118.38	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	327.	125.	0.062	65.33	0.993D
PB-212	153.39	77.11	340.	135.	0.067	52.26	0.995A
RA-226	371.47	186.15	652.	121.	0.061	84.02	1.500s
PB-212	476.91	238.88	649.	999.	0.499	15.52	0.898
PB-214	483.37	242.11	305.	79.	0.040	94.91	0.616s
PB-214	589.58	295.22	270.	234.	0.117	38.35	0.842
AC-228	675.70	338.28	270.	205.	0.103	46.91	1.133
PB-214	703.09	351.98	241.	402.	0.201	24.32	1.057
SB-125	925.00	462.94	111.	64.	0.032	77.89	1.500s
TL-208	1020.68	510.78	199.	138.	0.069	50.55	1.431s
TL-208	1165.71	583.31	159.	346.	0.173	25.61	1.267
BI-214	1218.05	609.48	90.	321.	0.160	21.26	1.394
CS-137	1323.21	662.06	93.	63.	0.031	83.75	0.766s
BI-212	1453.87	727.40	111.	94.	0.047	71.41	1.209s
CS-134	1589.73	795.33	61.	35.	0.017	108.01	1.500
AC-228	1822.12	911.54	70.	240.	0.120	26.54	1.947s
AC-228	1936.81	968.90	35.	111.	0.056	36.19	1.541D
BI-214	2241.02	1121.02	63.	91.	0.046	52.84	1.974s
K-40	2921.41	1461.27	32.	1060.	0.530	9.34	1.939
BI-214	3528.62	1764.93	3.	50.	0.025	41.21	1.185s

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		7.0661E-02					
			477.56	7.066E-02	%(	2.942E-01 8.72E-02	G
K-40		1.1373E+01					
			1460.75	1.137E+01	(P	3.129E-01 3.61E-01	G
MN-54		1.1833E-04					
			834.81	1.183E-04	%(P	3.086E-02 8.73E-03	G
CO-57		-7.1298E-04					
			122.07	-7.130E-04	&(P	4.333E-02 1.29E-02	G K
			136.43	0.000E+00	%	3.561E-01 1.06E-01	G
CO-60		1.3062E-02					
			1332.51	1.306E-02	%(P	2.999E-02 8.86E-03	G K
			1173.23	9.121E-03	% P	4.373E-02 1.27E-02	G K
Sr-85		-2.0604E-02					
			514.00	-2.060E-02	%(	4.059E-02 1.23E-02	G
Kr-85		-4.4813E+02					
			513.99	-4.481E+02	%(	8.841E+02 2.69E+02	G
Y-88		-8.9067E-05					
			1836.01	-8.907E-05	%(P	2.315E-02 5.84E-03	G K
			898.02	-5.543E-04	% P	3.723E-02 1.05E-02	G
NB-94		-5.9901E-03					
			871.10	-5.990E-03	%(	2.987E-02 8.69E-03	G K
			702.50	-3.151E-04	&	3.221E-02 9.24E-03	G K
Ag-108M		4.2111E-03					
			722.95	4.211E-03	%(	3.611E-02 1.05E-02	G K
			614.37	-2.522E-03	% P	3.688E-02 1.07E-02	G
			433.93	-1.805E-04	%	3.011E-02 8.73E-03	G
CD-109		3.9243E-02					
			88.04	3.924E-02	%(	1.835E+00 5.47E-01	G
SN-113		-4.1635E-03					
			391.71	-4.164E-03	&(	4.414E-02 1.30E-02	G K
			255.04	-2.227E-01	&	1.434E+00 4.27E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	6.2759E-02						
		427.95	-1.903E-02	&(P	9.005E-02	2.66E-02	G K
		600.77	-1.992E-02	& P	1.782E-01	5.21E-02	G
		636.15	-2.849E-02	% P	2.482E-01	7.15E-02	G
		463.51	3.049E-01	(P	2.480E-01	8.07E-02	G
		176.29	1.778E-01	&	4.489E-01	1.36E-01	G
I-131	3.6300E-03						
		364.48	3.630E-03	%(P	4.244E-02	1.24E-02	G K
		636.97	-1.163E-01	%	5.810E-01	1.70E-01	G
		284.29	-1.593E-01	% P	6.805E-01	2.03E-01	G
CS-134	-1.7595E-02						
		604.66	-1.760E-02	&(	3.799E-02	1.15E-02	G K
		795.76	2.978E-02	+ P	3.358E-02	1.07E-02	G
		569.29	-1.788E-02	& P	2.030E-01	5.86E-02	G
		801.84	1.513E-01	% P	2.848E-01	8.65E-02	G
CS-137	4.7166E-02						
		661.62	4.717E-02	(P	3.581E-02	1.35E-02	G
CE-139	9.1854E-04						
		165.85	9.185E-04	%(	3.397E-02	1.00E-02	G
EU-152	-9.7616E-04						
		121.78	-9.762E-04	%(P	1.345E-01	4.00E-02	G K
		344.30	-1.695E-02	% P	1.049E-01	3.11E-02	G
		1408.08	5.704E-02	%	1.258E-01	3.80E-02	G
		964.00	1.950E-03	% P	2.515E-01	7.15E-02	G
		1112.07	2.679E-03	%	2.310E-01	6.46E-02	G
		778.90	-9.624E-03	%	2.368E-01	6.77E-02	G
EU-154	-2.0466E-02						
		123.10	-2.047E-02	%(	1.039E-01	3.12E-02	G K
		1274.80	2.598E-02	&	1.046E-01	3.06E-02	G
		723.30	-8.706E-04	%	1.671E-01	4.79E-02	G
		1004.80	-1.729E-02	&	2.159E-01	6.22E-02	G
EU-155	1.4910E-01						
		86.45	1.491E-01	%(	2.054E-01	6.29E-02	G K
		105.31	3.394E-02	%	2.122E-01	6.35E-02	G
HG-203	1.5889E-02						
		279.17	1.589E-02	&(P	3.310E-02	1.00E-02	G K
		72.87	-6.843E-01	% P	2.000E+00	6.03E-01	G
		70.83	6.607E-01	%	3.910E+00	1.17E+00	G
		82.50	-6.274E-01	%	3.667E+00	1.10E+00	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments

TL-208       2.3115E-01
                          583.14 2.312E-01  (P 4.114E-02 2.00E-02 G
                          510.72 3.167E-01 + P 1.574E-01 6.37E-02 G

PB-212       6.8821E-01
                          238.63 6.802E-01  (P 8.275E-02 3.56E-02 G K
                                                          Energy duplication
                           77.11 5.186E-01 } P 3.411E-01 9.03E-02 G
                           74.81 9.789E-01 + P 6.822E-01 2.18E-01 G

PB-214       4.1381E-01
                          351.99 4.155E-01  (P 7.765E-02 3.42E-02 G K
                          295.22 4.106E-01  (P 1.388E-01 5.34E-02 G
                                                          Energy duplication
                           77.11 2.904E-01 } P 8.366E-01 1.99E-01 G
                          241.92 3.137E-01 -   3.330E-01 9.93E-02 G

BI-212       5.4338E-01
                          727.17 5.434E-01 @(P 3.003E-01 1.30E-01 G K
                         1620.56 1.723E-01 % P 8.087E-01 2.26E-01 G
                          785.42 4.913E-01 %   1.726E+00 5.12E-01 G

BI-214       4.1401E-01
                          609.32 4.141E-01  (P 6.076E-02 2.99E-02 G K
                         1764.51 4.138E-01  (P 9.269E-02 6.06E-02 G
                         1120.28 5.734E-01 + P 2.487E-01 1.03E-01 G

RA-224      -6.2810E-01
                          241.00-6.281E-01 %(  8.780E-01 2.69E-01 G

RA-226       9.8056E-01
                          185.99 9.806E-01  (P 9.844E-01 3.04E-01 G

AC-228       6.6047E-01
                          911.07 6.708E-01  (P 1.166E-01 6.02E-02 G K
                          968.90 5.414E-01 - P 1.470E-01 6.54E-02 G
                          338.40 6.356E-01  (P 2.456E-01 9.99E-02 G

TH-227      -1.5210E-01
                          236.00-1.521E-01 %(  3.509E-01 1.06E-01 G K
                          256.25 7.677E-02 % P 4.369E-01 1.30E-01 G

PA-234      -2.1482E-02
                           98.44-2.148E-02 &(P 1.913E-01 5.71E-02 G K
                          946.00 1.178E-03 % P 1.585E-01 4.47E-02 G
                          131.28-3.897E-02 % P 1.890E-01 5.67E-02 G
                           94.67-8.883E-02 % P 3.854E-01 1.16E-01 G
                          883.24 6.151E-02 &   1.971E-01 5.80E-02 G
                          926.70-1.730E-02 %   2.618E-01 7.42E-02 G
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 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          569.26-2.704E-02 & P 3.000E-01 8.66E-02 G

TH-234       3.3396E-01
                           63.29 3.340E-01 &(P 5.537E+00 1.64E+00 G K
                           92.80 9.624E-01 % P 1.997E+00 6.03E-01 G
                           92.38 1.170E+00 % P 2.345E+00 7.08E-01 G

AM-241      -4.5096E-03
                           59.54-4.510E-03 &(P 9.995E-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	6.6792E-02	7.0661E-02	2.6166E-01	2.6169E-01	2.781E-01
K-40		1.1373E+01	1.1373E+01	1.0814E+00	1.2671E+00	
MN-54	#A	1.1720E-04	1.1833E-04	2.6187E-02	2.6187E-02	3.057E-02
CO-57	#B	-7.0508E-04	-7.1298E-04	5.8834E-02	5.8834E-02	4.285E-02
CO-60	#B	1.3042E-02	1.3062E-02	2.6583E-02	2.6593E-02	2.994E-02

Sr-85	#A	-1.9670E-02	-2.0604E-02	3.7004E-02	3.7024E-02	3.875E-02
Kr-85	#A	-4.4812E+02	-4.4813E+02	8.0597E+02	8.0639E+02	8.841E+02
Y-88	#B	-8.6590E-05	-8.9067E-05	2.2072E-03	2.2072E-03	2.251E-02
NB-94	#B	-5.9901E-03	-5.9901E-03	2.6084E-02	2.6086E-02	2.987E-02
Ag-108M	#B	4.2109E-03	4.2111E-03	3.1472E-02	3.1473E-02	3.610E-02
CD-109	#A	3.8984E-02	3.9243E-02	1.6417E+00	1.6417E+00	1.823E+00
SN-113	#B	-4.0562E-03	-4.1635E-03	3.8863E-02	3.8864E-02	4.300E-02
SB-125	#B	6.2573E-02	6.2759E-02	4.9860E-02	4.9993E-02	8.979E-02
I-131	#B	2.4973E-03	3.6300E-03	3.7166E-02	3.7167E-02	2.920E-02
CS-134	#B	-1.7525E-02	-1.7595E-02	3.4510E-02	3.4525E-02	3.784E-02
CS-137		4.7153E-02	4.7166E-02	4.0376E-02	4.0469E-02	
CE-139	#A	8.9868E-04	9.1854E-04	3.0147E-02	3.0147E-02	3.323E-02
EU-152	#B	-9.7553E-04	-9.7616E-04	9.1841E+00	9.1841E+00	1.344E-01
EU-154	#B	-2.0446E-02	-2.0466E-02	9.3534E-02	9.3541E-02	1.038E-01
EU-155	#B	1.4886E-01	1.4910E-01	1.8868E-01	1.8886E-01	2.050E-01
HG-203	#B	1.4896E-02	1.5889E-02	3.0111E-02	3.0125E-02	3.103E-02
TL-208		2.3115E-01	2.3115E-01	5.9928E-02	6.1412E-02	
PB-212		6.8821E-01	6.8821E-01	1.0807E-01	1.1522E-01	
PB-214		4.1381E-01	4.1381E-01	9.5502E-02	9.8477E-02	
BI-212	#	5.4338E-01	5.4338E-01	3.9009E-01	3.9137E-01	
BI-214		4.1401E-01	4.1401E-01	8.9795E-02	9.2956E-02	
RA-224	#A	-6.2810E-01	-6.2810E-01	8.0762E-01	8.0844E-01	8.780E-01
RA-226	#A	9.8056E-01	9.8056E-01	9.1194E-01	9.1371E-01	9.844E-01
AC-228		6.6047E-01	6.6047E-01	1.7777E-01	1.8186E-01	
TH-227	#B	-1.5210E-01	-1.5210E-01	3.1865E-01	3.1877E-01	3.509E-01
PA-234	#B	-2.1482E-02	-2.1482E-02	1.9634E-01	1.9634E-01	1.913E-01
TH-234	#B	3.3396E-01	3.3396E-01	4.9295E+00	4.9295E+00	5.537E+00
AM-241	#A	-4.5095E-03	-4.5096E-03	1.9238E+00	1.9238E+00	9.995E-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 (1073.0 to 2000.7 keV) 1.4370708E+01 pCi/gm
Total Decayed Activity (1073.0 to 2000.7 keV) 1.4370721E+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_1AUG2006_0820.An1

Sample description
FSS-OOL-10-04-009-F

Spectrum Filename: C:\GammaVision\Spectra\107F_1AUG2006_0820.An1

Acquisition information
Start time: 01-Aug-2006 08:22:01
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: 1.9670E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.9670E+03) =
5.0839E+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	27-Jul-2006 08:40:00
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. 21 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.2562

***** 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	392.	11.99	1.18	2.849E-02	74.81	9.600	9.840E-01	PB212
77.08	397.	10.33	1.18	2.957E-02	77.11	17.500	7.901E-01	PB212
					77.11	10.700	1.282E+00	PB214
77.31	179.	30.67	1.50	2.957E-02	77.11	17.500	PBC<MDA	PB212
					77.11	10.700	PBC<MDA	PB214
86.99	249.	16.78	1.19	3.293E-02	86.45	32.740	1.596E-01	EU155
					88.04	3.790	1.367E+00	CD109
93.33	286.	14.31	1.19	3.445E-02	92.38	2.570	2.165E+00	TH234
					92.80	3.000	1.771E+00	TH234
127.72	171.	32.96	0.80	3.814E-02				
185.52	282.	17.49	1.83	3.614E-02	185.99	3.280	1.637E+00	RA226
209.39	141.	24.60	1.63	3.428E-02				
231.96	174.	16.75	1.50	3.211E-02	236.00	11.200	3.321E-01	TH227
238.80	1658.	3.12	1.30	3.188E-02	238.63	43.100	8.205E-01	PB212
241.97	271.	14.36	1.30	3.163E-02	241.00	3.900	1.496E+00	RA224
					241.92	7.470	7.851E-01	PB214
270.41	151.	26.79	1.85	2.943E-02				
277.48	90.	35.63	1.53	2.891E-02				
295.33	370.	7.84	1.34	2.767E-02	295.22	19.200	4.722E-01	PB214
300.47	118.	19.56	1.34	2.732E-02				
328.07	100.	29.59	1.42	2.560E-02				
338.59	358.	10.53	1.67	2.499E-02	338.40	12.010	8.117E-01	AC228
351.94	664.	6.40	1.67	2.426E-02	351.99	37.100	5.027E-01	PB214
463.38	167.	19.33	1.84	1.953E-02				
463.38	167.	19.33	1.84	1.953E-02	463.51	10.000	5.796E-01	SB125
510.93	286.	13.22	2.47	1.808E-02	510.72	22.500	4.261E-01	TL208
					513.99	0.004	2.514E+03	Kr85

					514.00	99.270	1.161E-01	Sr85
583.44	619.	6.62	1.74	1.628E-02	583.14	86.000	3.014E-01	TL208
609.62	493.	7.68	1.60	1.574E-02	609.32	46.090	4.627E-01	BI214
727.20	222.	15.14	2.11	1.374E-02	727.17	11.800	9.334E-01	BI212
785.63	63.	33.46	1.16	1.297E-02	785.42	2.000	1.673E+00	BI212
795.13	57.	28.63	1.68	1.284E-02	795.76	85.400	3.561E-02	CS134

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
911.68	492.	6.69	1.60	1.160E-02	911.07	29.000	9.959E-01	AC228
964.87	73.	20.70	1.80	1.113E-02				
969.27	216.	9.23	1.80	1.109E-02	968.90	17.460	7.570E-01	AC228
1120.29	140.	17.96	2.01	9.970E-03	1120.28	15.040	6.360E-01	BI214
1461.25	1845.	2.36	2.38	8.189E-03	1460.75	10.700	1.442E+01	K40
1622.08	29.	20.37	0.68	7.569E-03	1620.56	2.750	9.670E-01	BI212
1765.03	118.	10.30	2.00	7.082E-03	1764.51	15.920	7.146E-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	
185.96	93.13	728.	261.	0.130	47.63	1.191	U-235	D
255.09	127.72	1117.	216.	0.108	68.90	0.799	AC-228	s
418.42	209.39	506.	141.	0.071	73.81	1.632	AC-228	s
540.45	270.41	529.	151.	0.075	80.38	1.849	AC-228	s
554.59	277.48	391.	88.	0.044	100.95	1.534	NP-239	
600.60	300.49	304.	117.	0.058	73.39	0.949	PB-212	M
655.75	328.07	314.	100.	0.050	88.77	1.423	AC-228	s
1930.02	964.90	76.	73.	0.037	61.44	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	932.	392.	0.196	35.98	1.178D
PB-212	153.89	77.11	995.	397.	0.199	30.98	1.179A
PB-214	153.89	77.11	1787.	179.	0.089	92.01	1.500A
EU-155	174.22	87.28	1839.	200.	0.100	93.59	1.500
CD-109	174.09	87.21	1703.	192.	0.096	93.62	1.500
TH-234	185.94	93.14	1691.	267.	0.134	65.77	1.500
TH-234	185.91	93.12	1630.	256.	0.128	64.27	1.500
PA-234	191.09	95.72	1741.	-154.	-0.077	117.69	1.500s
RA-226	370.68	185.52	829.	282.	0.141	52.48	1.826s
TH-227	463.56	231.96	339.	174.	0.087	50.26	1.500s
PB-212	476.89	238.63	452.	1641.	0.820	9.11	1.297D
PB-214	483.47	241.92	636.	260.	0.130	44.80	1.299D
PB-214	590.33	295.36	289.	375.	0.188	25.06	1.554s
AC-228	676.80	338.59	357.	355.	0.177	31.58	1.666s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
PB-214	703.50	351.94	362.	658.	0.329	19.20	1.669s
SB-125	926.42	463.41	205.	103.	0.051	64.09	1.500s
TL-208	1021.45	510.93	313.	252.	0.126	39.67	2.472s
TL-208	1166.47	583.44	257.	615.	0.307	19.86	1.741
BI-214	1218.83	609.62	228.	489.	0.244	23.04	1.597s
BI-212	1453.97	727.20	194.	220.	0.110	45.43	2.109s
BI-212	1570.82	785.63	119.	63.	0.032	100.37	1.160s
CS-134	1589.82	795.13	106.	57.	0.028	85.89	1.684s
AC-228	1822.91	911.68	145.	488.	0.244	20.06	1.598
AC-228	1937.36	968.90	108.	213.	0.107	28.72	1.799D
BI-214	2240.14	1120.29	133.	139.	0.069	53.87	2.006s
K-40	2922.10	1461.25	21.	1840.	0.920	7.08	2.383s
BI-212	3243.77	1622.08	3.	29.	0.015	61.10	0.679s
BI-214	3529.71	1765.03	8.	117.	0.059	30.89	1.995

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		1.1046E-01					
			477.56	1.105E-01	%(	2.364E-01 7.16E-02	G
K-40		1.4425E+01					
			1460.75	1.442E+01	@(P	1.880E-01 3.42E-01	G
MN-54		1.5197E-02					
			834.81	1.520E-02	&(P	2.974E-02 9.04E-03	G
CO-57		-1.0335E-02					
			122.07	-1.034E-02	%(P	3.752E-02 1.13E-02	G K
			136.43	-5.944E-02	& P	2.675E-01 8.04E-02	G
CO-60		-2.0260E-03					
			1332.51	-2.026E-03	%(P	2.597E-02 6.96E-03	G K
			1173.23	-3.022E-03	% P	4.045E-02 1.15E-02	G K
Sr-85		-2.7775E-02					
			514.00	-2.778E-02	%(	3.806E-02 1.17E-02	G
Kr-85		-6.3451E+02					
			513.99	-6.345E+02	%(P	8.362E+02 2.56E+02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
Y-88	-5.3519E-03						
		1836.01	-5.352E-03	%(P	2.966E-02	8.32E-03	G K
		898.02	-7.586E-03	& P	3.415E-02	9.98E-03	G
NB-94	5.6048E-04						
		871.10	5.605E-04	&(P	2.863E-02	8.24E-03	G K
		702.50	9.377E-03	% P	2.964E-02	8.85E-03	G K
Ag-108M	-6.3824E-04						
		722.95	-6.382E-04	&(	5.698E-02	1.68E-02	G K
		614.37	-1.671E-02	&	3.727E-02	1.13E-02	G
		433.93	2.584E-04	% P	1.965E-02	5.65E-03	G
CD-109	1.0537E+00						
		88.04	1.054E+00	(P	1.071E+00	3.29E-01	G
SN-113	6.4630E-03						
		391.71	6.463E-03	&(P	3.684E-02	1.09E-02	G K
		255.04	-1.817E-01	&	1.249E+00	3.73E-01	G
SB-125	1.0074E-01						
		427.95	1.206E-02	&(P	7.519E-02	2.22E-02	G K
		600.77	-1.525E-02	% P	1.371E-01	3.98E-02	G
		636.15	4.327E-02	% P	2.257E-01	6.64E-02	G
		463.51	3.632E-01	(P	2.451E-01	7.97E-02	G
		176.29	-3.406E-02	& P	4.584E-01	1.37E-01	G
I-131	-6.0808E-03						
		364.48	-6.081E-03	%(	4.276E-02	1.27E-02	G K
		636.97	6.083E-02	%	4.937E-01	1.44E-01	G
		284.29	1.885E-01	%	6.075E-01	1.83E-01	G
CS-134	1.5965E-02						
		604.66	-1.219E-03	&(P	5.899E-02	1.75E-02	G K
		795.76	3.561E-02	*(P	3.185E-02	1.03E-02	G
		569.29	4.885E-02	&	1.743E-01	5.20E-02	G
		801.84	-8.566E-02	% P	3.097E-01	9.17E-02	G
CS-137	-1.4421E-03						
		661.62	-1.442E-03	&(P	3.279E-02	9.40E-03	G
CE-139	-2.4674E-04						
		165.85	-2.467E-04	&(P	3.676E-02	1.10E-02	G
EU-152	-3.3412E-02						
		121.78	-3.341E-02	%(P	1.087E-01	3.28E-02	G K
		344.30	-2.778E-02	% P	9.399E-02	2.81E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
		1408.08	1.771E-02	% P	1.329E-01	3.79E-02	G
		964.00	-2.121E-02	& P	2.953E-01	8.66E-02	G
		1112.07	4.936E-02	& P	2.594E-01	7.61E-02	G
		778.90	-6.196E-02	% P	2.193E-01	6.50E-02	G
EU-154	-1.8370E-02						
		123.10	-1.837E-02	&(P	7.355E-02	2.21E-02	G K
		1274.80	-3.985E-02	% P	1.165E-01	3.48E-02	G
		723.30	-7.572E-02	& P	1.889E-01	5.69E-02	G
		1004.80	2.036E-02	& P	1.745E-01	5.07E-02	G
EU-155	1.2780E-01						
		86.45	1.278E-01	(	1.297E-01	3.99E-02	G K
		105.31	4.791E-02	% P	1.541E-01	4.65E-02	G
HG-203	2.6294E-04						
		279.17	2.629E-04	&(P	3.290E-02	9.72E-03	G K
		72.87	-7.408E-01	% P	1.053E+00	3.21E-01	G
		70.83	-3.635E-02	&	1.734E+00	5.20E-01	G
		82.50	-7.389E-01	%	2.097E+00	6.34E-01	G
TL-208	3.0143E-01						
		583.14	3.014E-01	(P	3.799E-02	2.01E-02	G
		510.72	4.261E-01	+ P	1.437E-01	6.39E-02	G
PB-212	8.1130E-01						
		238.63	8.199E-01	(P	5.089E-02	2.51E-02	G K
							Energy duplication
		77.11	5.276E-01	}	1.987E-01	5.45E-02	G
		74.81	9.840E-01	+ P	3.641E-01	1.19E-01	G
PB-214	4.9661E-01						
		351.99	5.027E-01	@(P	6.970E-02	3.24E-02	G K
		295.22	4.849E-01	(P	1.059E-01	4.10E-02	G
							Energy duplication
		77.11	3.878E-01	} P	4.336E-01	1.19E-01	G
		241.92	7.574E-01	+ P	3.495E-01	1.14E-01	G
BI-212	9.3972E-01						
		727.17	9.334E-01	*(P	2.862E-01	1.42E-01	G K
		1620.56	9.670E-01	*(P	3.423E-01	2.00E-01	G
		785.42	1.673E+00	+ P	1.418E+00	5.71E-01	G
BI-214	4.6272E-01						
		609.32	4.627E-01	*(P	6.924E-02	3.59E-02	G K
		1764.51	7.146E-01	+ P	9.527E-02	7.42E-02	G
		1120.28	6.360E-01	+ P	2.588E-01	1.15E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
RA-224	-2.4233E-02						
		241.00	-2.423E-02	&(P	8.371E-01	2.49E-01	G
RA-226	1.6373E+00						
		185.99	1.637E+00	*(	7.941E-01	2.86E-01	G
AC-228	9.9587E-01						
		911.07	9.959E-01	(P	1.201E-01	6.72E-02	G K
		968.90	7.571E-01	- P	1.811E-01	7.32E-02	G
		338.40	8.117E-01	- P	2.077E-01	8.62E-02	G
TH-227	3.3210E-01						
		236.00	3.321E-01	?(P	1.690E-01	5.57E-02	G K
		256.25	5.387E-02	& P	3.540E-01	1.05E-01	G
PA-234	1.9187E-02						
		98.44	1.919E-02	%(	1.333E-01	4.00E-02	G K
		946.00	1.520E-02	&	1.479E-01	4.29E-02	G
		131.28	-4.194E-02	%	1.542E-01	4.65E-02	G
		94.67	-1.960E-01	+	2.514E-01	7.69E-02	G
		883.24	-5.960E-02	%	2.560E-01	7.57E-02	G
		926.70	1.938E-02	%	2.035E-01	5.82E-02	G
		569.26	7.201E-02	&	2.574E-01	7.67E-02	G
TH-234	1.3126E+00						
		63.29	5.012E-01	%(P	1.620E+00	4.88E-01	G K
		92.80	1.707E+00	(P	1.271E+00	3.94E-01	G
		92.38	2.084E+00	(P	1.515E+00	4.70E-01	G
AM-241	2.6794E-02						
		59.54	2.679E-02	%(P	1.838E-01	5.51E-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	1.0354E-01	1.1046E-01	2.1482E-01	2.1492E-01	2.216E-01
K-40	#	1.4425E+01	1.4425E+01	1.0245E+00	1.3324E+00	
MN-54	#A	1.5029E-02	1.5197E-02	2.7125E-02	2.7140E-02	2.942E-02
CO-57	#B	-1.0204E-02	-1.0335E-02	3.4312E-02	3.4317E-02	3.704E-02
CO-60	#B	-2.0224E-03	-2.0260E-03	1.1228E-01	1.1228E-01	2.593E-02
Sr-85	#A	-2.6333E-02	-2.7775E-02	3.5122E-02	3.5161E-02	3.608E-02
Kr-85	#A	-6.3449E+02	-6.3451E+02	8.3596E+02	8.3679E+02	8.361E+02
Y-88	#B	-5.1811E-03	-5.3519E-03	3.4356E-02	3.4357E-02	2.872E-02
NB-94	#B	5.6048E-04	5.6048E-04	2.4705E-02	2.4705E-02	2.863E-02
Ag-108M	#B	-6.3819E-04	-6.3824E-04	5.0548E-02	5.0548E-02	5.697E-02
CD-109	#A	1.0457E+00	1.0537E+00	9.8812E-01	9.8984E-01	1.063E+00
SN-113	#B	6.2718E-03	6.4630E-03	3.2701E-02	3.2703E-02	3.575E-02
SB-125	#F	1.0040E-01	1.0074E-01	6.6334E-02	6.6600E-02	7.493E-02
I-131	#B	-3.9557E-03	-6.0808E-03	3.7966E-02	3.7968E-02	2.781E-02
CS-134	#B	1.5892E-02	1.5965E-02	1.3842E-02	1.3874E-02	5.872E-02
CS-137	#A	-1.4417E-03	-1.4421E-03	1.9087E-01	1.9087E-01	3.278E-02
CE-139	#A	-2.4061E-04	-2.4674E-04	6.4641E-02	6.4641E-02	3.585E-02
EU-152	#B	-3.3388E-02	-3.3412E-02	9.8900E-02	9.8917E-02	1.086E-01
EU-154	#B	-1.8350E-02	-1.8370E-02	6.8172E-02	6.8179E-02	7.347E-02
EU-155	#A	1.2755E-01	1.2780E-01	1.1961E-01	1.1982E-01	1.294E-01
HG-203	#B	2.4414E-04	2.6294E-04	2.9172E-02	2.9172E-02	3.055E-02
TL-208		3.0143E-01	3.0143E-01	6.0318E-02	6.2890E-02	
PB-212		8.1130E-01	8.1130E-01	7.4616E-02	8.8676E-02	
PB-214		4.9661E-01	4.9661E-01	7.9210E-02	8.4466E-02	
BI-212	#	9.3972E-01	9.3972E-01	3.6244E-01	3.6667E-01	
BI-214		4.6272E-01	4.6272E-01	1.0756E-01	1.1098E-01	
RA-224	#A	-2.4233E-02	-2.4233E-02	2.3168E+00	2.3168E+00	8.371E-01
RA-226	#	1.6373E+00	1.6373E+00	8.5925E-01	8.6468E-01	
AC-228		9.9587E-01	9.9587E-01	2.0154E-01	2.0995E-01	
TH-227	#	3.3210E-01	3.3210E-01	1.6716E-01	1.6831E-01	1.690E-01

PA-234 #B	1.9187E-02	1.9187E-02	1.2005E-01	1.2005E-01	1.333E-01

TH-234 #B	1.3126E+00	1.3126E+00	8.8904E-01	8.9202E-01	1.620E+00
AM-241 #A	2.6794E-02	2.6794E-02	1.6528E-01	1.6529E-01	1.838E-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) 2.0069496E+01 pCi/gm
Total Decayed Activity (1120.2 to 2000.1 keV) 2.0069506E+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_1aug2006_1158.An1

Sample description
FSS-OOL-10-04-014-F

Spectrum Filename: C:\GammaVision\Spectra\107f_1aug.An1

Acquisition information

Start time:	01-Aug-2006 11:58:39
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:	2.1100E+03
Activity scaling factor:	1.0000E+06/(1.0000E+00* 2.1100E+03) = 4.7393E+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	27-Jul-2006 07:50:00
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. 19 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.2766

***** 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
74.99	349.	13.86	1.18	2.862E-02	74.81	9.600	8.087E-01	PB212
77.10	561.	8.83	1.18	2.960E-02	77.11	17.500	6.946E-01	PB212
					77.11	10.700	1.126E+00	PB214
86.99	202.	20.09	1.19	3.304E-02	86.45	32.740	1.208E-01	EU155
					88.04	3.790	1.035E+00	CD109
93.72	171.	24.74	1.19	3.462E-02	92.80	3.000	PBC<MDA	TH234
					94.67	15.500	2.026E-01	PA234
185.85	271.	20.63	1.62	3.611E-02	185.99	3.280	1.466E+00	RA226
209.55	198.	24.69	0.88	3.426E-02				
238.80	1411.	3.38	1.30	3.187E-02	238.63	43.100	6.499E-01	PB212
242.03	209.	14.69	1.30	3.161E-02	241.00	3.900	1.073E+00	RA224
					241.92	7.470	5.637E-01	PB214
295.46	355.	7.65	1.34	2.766E-02	295.22	19.200	4.222E-01	PB214
300.45	90.	24.60	1.34	2.732E-02				
328.31	93.	25.88	1.40	2.559E-02				
338.39	350.	13.86	1.41	2.500E-02	338.40	12.010	7.396E-01	AC228
352.03	631.	6.73	1.47	2.426E-02	351.99	37.100	4.454E-01	PB214
409.06	88.	31.06	1.60	2.156E-02				
463.04	127.	22.08	2.14	1.954E-02				
463.04	127.	22.08	2.14	1.954E-02	463.51	10.000	4.094E-01	SB125
511.07	251.	13.16	1.56	1.807E-02	510.72	22.500	3.422E-01	TL208
583.42	521.	6.89	1.76	1.628E-02	583.14	86.000	2.361E-01	TL208
609.72	426.	5.99	1.52	1.573E-02	609.32	46.090	3.718E-01	BI214
727.89	132.	20.32	1.58	1.373E-02	727.17	11.800	5.170E-01	BI212
769.50	82.	26.81	1.44	1.317E-02				
795.63	48.	35.75	1.69	1.284E-02				
795.63	48.	35.75	1.69	1.284E-02	795.76	85.400	2.763E-02	CS134

860.61	67.	26.12	0.68	1.211E-02				
911.65	373.	6.73	1.66	1.160E-02	911.07	29.000	7.016E-01	AC228
968.89	275.	11.47	1.58	1.109E-02	968.90	17.460	9.013E-01	AC228
1121.23	103.	20.09	1.01	9.970E-03	1120.28	15.040	4.404E-01	BI214
1461.37	1687.	2.50	2.21	8.188E-03	1460.75	10.700	1.230E+01	K40
1621.41	31.	20.14	1.11	7.569E-03	1620.56	2.750	9.538E-01	BI212
1765.46	94.	11.18	1.99	7.081E-03	1764.51	15.920	5.259E-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
174.04	87.20	750.	199.	0.099	62.15	1.187	PB-214 D
418.73	209.55	783.	198.	0.099	74.08	0.879	AC-228 s
600.56	300.47	354.	80.	0.040	117.98	1.396	PB-212 sM
656.23	328.31	212.	93.	0.047	77.64	1.403	RH-106M s
817.73	409.06	238.	88.	0.044	93.17	1.600	CS-138
1538.58	769.50	122.	82.	0.041	66.12	1.442	BI-214 sM
1720.78	860.61	84.	67.	0.034	78.35	0.683	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	149.29	74.81	864.	344.	0.172	39.28	1.178D
PB-212	153.89	77.11	948.	401.	0.201	29.31	1.179A
EU-155	174.09	87.21	1635.	222.	0.111	80.00	1.500
CD-109	174.07	87.20	1486.	207.	0.103	81.61	1.500
TH-234	186.09	93.21	1532.	198.	0.099	78.36	1.500s
RA-226	371.35	185.85	952.	271.	0.135	61.90	1.618s
PB-212	476.89	238.63	378.	1386.	0.693	9.87	1.297D
PB-214	483.47	241.92	570.	200.	0.100	54.46	1.299D
PB-214	590.56	295.47	550.	443.	0.222	32.50	1.440
AC-228	676.39	338.39	504.	347.	0.173	41.59	1.415s
PB-214	703.67	352.03	340.	626.	0.313	20.19	1.475s
SB-125	926.26	463.33	206.	70.	0.035	89.98	1.500s
TL-208	1021.73	511.07	274.	217.	0.109	39.48	1.564s
TL-208	1166.41	583.42	197.	516.	0.258	20.67	1.759
BI-214	1219.01	609.72	102.	421.	0.211	17.97	1.518
Ag-108M	1224.13	612.28	247.	-66.	-0.033	108.28	1.561s
BI-212	1455.36	727.89	165.	131.	0.065	60.97	1.584
CS-134	1590.05	795.24	80.	44.	0.022	96.06	1.684
AC-228	1822.86	911.65	90.	369.	0.184	20.20	1.661
AC-228	1937.35	968.89	165.	273.	0.136	34.40	1.583
BI-214	2242.02	1121.23	96.	103.	0.052	60.27	1.010s
K-40	2922.35	1461.37	26.	1683.	0.841	7.49	2.210

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
BI-212	3242.45	1621.41	3.	31.	0.015	60.42	1.110s
BI-214	3530.56	1765.46	4.	93.	0.046	33.54	1.989

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		-1.2544E-03					
			477.56	-1.254E-03	%(	1.706E-01 4.90E-02	G
K-40		1.2295E+01					
			1460.75	1.230E+01	(P	1.949E-01 3.08E-01	G
MN-54		-5.8666E-03					
			834.81	-5.867E-03	%(P	2.477E-02 7.27E-03	G
CO-57		-9.5508E-03					
			122.07	-9.551E-03	%(P	3.468E-02 1.04E-02	G K
			136.43	-4.502E-03	& P	2.506E-01 7.48E-02	G
CO-60		1.3378E-04					
			1332.51	1.338E-04	%(P	2.540E-02 6.97E-03	G K
			1173.23	-5.874E-03	% P	3.519E-02 1.01E-02	G K
Sr-85		-9.6851E-03					
			514.00	-9.685E-03	&(	3.224E-02 9.67E-03	G
Kr-85		-2.3540E+02					
			513.99	-2.354E+02	&(P	7.072E+02 2.11E+02	G
Y-88		5.5628E-04					
			1836.01	5.563E-04	&(P	2.046E-02 5.39E-03	G K
			898.02	-4.785E-03	% P	3.220E-02 9.34E-03	G
NB-94		3.0186E-03					
			871.10	3.019E-03	%(P	2.367E-02 6.86E-03	G K
			702.50	6.509E-03	% P	2.441E-02 7.23E-03	G K
Ag-108M		-5.9499E-04					
			722.95	-5.950E-04	&(	5.135E-02 1.52E-02	G K
			614.37	-2.968E-02	&	3.439E-02 1.07E-02	G
			433.93	-5.995E-04	% P	1.937E-02 5.56E-03	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CD-109	1.0596E+00						
		88.04	1.060E+00	(P	9.337E-01	2.89E-01	G
SN-113	-4.4339E-03						
		391.71	-4.434E-03	%(P	3.462E-02	1.02E-02	G K
		255.04	-2.100E-01	%	1.131E+00	3.38E-01	G
SB-125	7.5953E-02						
		427.95	2.351E-02	%(P	6.813E-02	2.04E-02	G K
		600.77	-5.468E-02	& P	1.482E-01	4.43E-02	G
		636.15	-2.253E-03	% P	2.230E-01	6.44E-02	G
		463.51	2.312E-01	*(P	2.292E-01	7.21E-02	G
		176.29	-1.599E-03	& P	3.331E-01	9.87E-02	G
I-131	-3.7731E-04						
		364.48	-3.773E-04	&(	4.087E-02	1.20E-02	G K
		636.97	-9.908E-02	%	5.050E-01	1.49E-01	G
		284.29	-4.280E-02	%	5.833E-01	1.73E-01	G
CS-134	1.5617E-02						
		604.66	6.729E-03	%(P	2.470E-02	7.34E-03	G K
		795.76	2.578E-02	(P	2.599E-02	8.35E-03	G
		569.29	2.205E-02	&	1.522E-01	4.47E-02	G
		801.84	-2.881E-02	& P	2.814E-01	8.15E-02	G
CS-137	4.5018E-03						
		661.62	4.502E-03	%(P	3.126E-02	9.14E-03	G
CE-139	3.9279E-03						
		165.85	3.928E-03	&(P	2.662E-02	7.95E-03	G
EU-152	-2.7437E-02						
		121.78	-2.744E-02	%(P	9.992E-02	3.01E-02	G K
		344.30	-6.933E-03	% P	8.032E-02	2.37E-02	G
		1408.08	-1.527E-02	& P	1.047E-01	2.93E-02	G
		964.00	-2.892E-02	% P	2.516E-01	7.38E-02	G
		1112.07	6.938E-02	% P	1.794E-01	5.36E-02	G
		778.90	2.152E-02	% P	1.753E-01	5.08E-02	G
EU-154	-7.6986E-03						
		123.10	-7.699E-03	%(P	5.847E-02	1.75E-02	G K
		1274.80	-3.488E-03	% P	1.060E-01	3.06E-02	G
		723.30	6.048E-02	& P	8.996E-02	2.80E-02	G
		1004.80	-5.597E-03	% P	1.695E-01	4.88E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
EU-155	1.3225E-01						
		86.45	1.322E-01	(	1.141E-01	3.53E-02	G K
		105.31	4.674E-02	% P	1.353E-01	4.09E-02	G
HG-203	1.6951E-02						
		279.17	1.695E-02	%(P	2.786E-02	8.51E-03	G K
		72.87	-5.245E-01	& P	9.487E-01	2.88E-01	G
		70.83	1.826E-01	%	1.280E+00	3.84E-01	G
		82.50	-3.415E-01	%	1.958E+00	5.89E-01	G
TL-208	2.3610E-01						
		583.14	2.361E-01	(P	3.111E-02	1.64E-02	G
		510.72	3.422E-01	+ P	1.256E-01	5.20E-02	G
PB-212	6.6010E-01						
		238.63	6.455E-01	(P	4.350E-02	2.15E-02	G K
							Energy duplication
		77.11	4.965E-01	}	1.809E-01	4.85E-02	G
		74.81	8.043E-01	+ P	3.271E-01	1.06E-01	G
PB-214	4.8358E-01						
		351.99	4.454E-01	*(P	6.309E-02	3.02E-02	G K
		295.22	5.345E-01	(P	1.349E-01	5.85E-02	G
							Energy duplication
		77.11	1.786E-01	} P	3.945E-01	1.05E-01	G
		241.92	5.424E-01	(P	3.089E-01	9.92E-02	G
BI-212	5.1702E-01						
		727.17	5.170E-01	(P	2.472E-01	1.06E-01	G K
		1620.56	9.538E-01	+ P	3.318E-01	1.95E-01	G
		785.42	6.986E-01	% P	1.325E+00	4.03E-01	G
BI-214	3.8866E-01						
		609.32	3.718E-01	(P	4.390E-02	2.25E-02	G K
		1764.51	5.259E-01	+ P	7.088E-02	5.94E-02	G
		1120.28	4.404E-01	@(P	2.065E-01	8.93E-02	G
RA-224	5.6705E-01						
		241.00	5.670E-01	%(P	8.354E-01	2.55E-01	G
RA-226	1.4657E+00						
		185.99	1.466E+00	*(	7.923E-01	3.02E-01	G
AC-228	7.1272E-01						
		911.07	7.016E-01	(P	8.937E-02	4.78E-02	G K
		968.90	9.013E-01	+ P	2.072E-01	1.04E-01	G
		338.40	7.396E-01	*(P	2.290E-01	1.03E-01	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments

TH-227      -4.8696E-04
                          236.00-4.870E-04 &(P 3.075E-01 9.18E-02 G K
                          256.25-5.749E-02 % P 3.440E-01 1.02E-01 G

PA-234      -4.6230E-02
                           98.44-4.623E-02 %(  1.152E-01 3.48E-02 G K
                          946.00 0.000E+00 &   1.662E-01 4.81E-02 G
                          131.28 1.779E-02 %   1.441E-01 4.32E-02 G
                           94.67 6.989E-04 %   2.236E-01 6.69E-02 G
                          883.24-3.727E-02 %   1.932E-01 5.64E-02 G
                          926.70-7.284E-02 %   2.719E-01 8.07E-02 G
                          569.26 3.259E-02 &   2.247E-01 6.61E-02 G

TH-234       8.1644E-01
                           63.29 4.975E-01 %(P 1.409E+00 4.24E-01 G K
                           92.80 1.231E+00  (P 1.149E+00 3.54E-01 G
                           92.38-1.825E-02 & P 1.327E+00 3.96E-01 G

AM-241       3.5061E-02
                           59.54 3.506E-02 %(P 1.664E-01 5.00E-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	-1.1730E-03	-1.2544E-03	1.4689E-01	1.4689E-01	1.596E-01
K-40		1.2295E+01	1.2295E+01	9.2394E-01	1.1752E+00	
MN-54	#A	-5.7996E-03	-5.8666E-03	2.3560E-02	2.3563E-02	2.448E-02
CO-57	#B	-9.4249E-03	-9.5508E-03	3.1713E-02	3.1718E-02	3.422E-02
CO-60	#B	1.3353E-04	1.3378E-04	2.0912E-02	2.0912E-02	2.535E-02
Sr-85	#A	-9.1641E-03	-9.6851E-03	2.8996E-02	2.9002E-02	3.051E-02
Kr-85	#A	-2.3539E+02	-2.3540E+02	7.8185E+02	7.8198E+02	7.072E+02
Y-88	#B	5.3788E-04	5.5628E-04	1.6171E-02	1.6171E-02	1.979E-02
NB-94	#B	3.0186E-03	3.0186E-03	2.0582E-02	2.0583E-02	2.367E-02
Ag-108M	#B	-5.9494E-04	-5.9499E-04	4.5513E-02	4.5513E-02	5.134E-02
CD-109	#	1.0513E+00	1.0596E+00	8.6607E-01	8.6806E-01	9.263E-01
SN-113	#B	-4.2979E-03	-4.4339E-03	4.4705E-02	4.4705E-02	3.356E-02
SB-125	#F	7.5684E-02	7.5953E-02	7.1078E-02	7.1220E-02	6.789E-02
I-131	#B	-2.4156E-04	-3.7731E-04	3.5947E-02	3.5947E-02	2.617E-02
CS-134	#B	1.5543E-02	1.5617E-02	1.5183E-02	1.5211E-02	2.458E-02
CS-137	#A	4.5003E-03	4.5018E-03	2.7423E-02	2.7425E-02	3.125E-02
CE-139	#A	3.8268E-03	3.9279E-03	2.3854E-02	2.3856E-02	2.594E-02
EU-152	#B	-2.7416E-02	-2.7437E-02	9.0855E-02	9.0868E-02	9.984E-02
EU-154	#B	-7.6897E-03	-7.6986E-03	5.5622E-02	5.5624E-02	5.840E-02
EU-155	#	1.3198E-01	1.3225E-01	1.0580E-01	1.0606E-01	1.139E-01
HG-203	#B	1.5696E-02	1.6951E-02	2.5515E-02	2.5535E-02	2.580E-02
TL-208		2.3610E-01	2.3610E-01	4.9240E-02	5.1176E-02	
PB-212		6.6010E-01	6.6010E-01	6.5910E-02	7.6577E-02	
PB-214		4.8358E-01	4.8358E-01	9.8436E-02	1.0250E-01	
BI-212		5.1702E-01	5.1702E-01	3.1833E-01	3.1980E-01	
BI-214		3.8866E-01	3.8866E-01	7.0569E-02	7.4208E-02	
RA-224	#A	5.6705E-01	5.6705E-01	7.6494E-01	7.6567E-01	8.354E-01
RA-226	#	1.4657E+00	1.4657E+00	9.0735E-01	9.1147E-01	
AC-228		7.1272E-01	7.1272E-01	1.4565E-01	1.5161E-01	
TH-227	#B	-4.8696E-04	-4.8696E-04	1.5066E-01	1.5066E-01	3.075E-01
PA-234	#B	-4.6230E-02	-4.6230E-02	1.0451E-01	1.0454E-01	1.152E-01
TH-234	#B	8.1644E-01	8.1644E-01	7.0344E-01	7.0490E-01	1.409E+00
AM-241	#A	3.5060E-02	3.5061E-02	1.4990E-01	1.4992E-01	1.664E-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) 1.6759270E+01 pCi/gm
Total Decayed Activity (295.2 to 2000.1 keV) 1.6759279E+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_8AUG2006_1903.An1

Sample description
FSS-OOL-10-04-020-F

Spectrum Filename: C:\GammaVision\Spectra\107F_8AUG2006_1903.An1

Acquisition information
Start time: 08-Aug-2006 19:04:02
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: 2.1550E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 2.1550E+03) =
4.6404E+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	27-Jul-2006 08:15:00
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. 21 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.1334

***** 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	346.	13.54	1.18	2.842E-02	74.81	9.600	7.837E-01	PB212
77.24	631.	8.28	1.18	2.971E-02	77.11	17.500	7.644E-01	PB212
					77.11	10.700	1.241E+00	PB214
87.21	166.	33.61	1.04	3.305E-02	86.45	32.740	9.746E-02	EU155
					88.04	3.790	PBC<MDA	CD109
92.67	250.	24.47	1.92	3.436E-02	92.38	2.570	1.726E+00	TH234
					92.80	3.000	1.403E+00	TH234
185.77	249.	21.32	1.94	3.612E-02	185.99	3.280	1.319E+00	RA226
238.74	1348.	3.51	1.30	3.189E-02	238.63	43.100	6.077E-01	PB212
241.70	247.	18.75	1.30	3.166E-02	241.00	3.900	1.242E+00	RA224
					241.92	7.470	6.518E-01	PB214
270.49	137.	18.05	1.32	2.942E-02				
277.27	81.	34.56	1.56	2.893E-02				
295.33	337.	8.44	1.34	2.768E-02	295.22	19.200	3.925E-01	PB214
300.30	93.	24.75	1.34	2.734E-02				
328.42	153.	23.64	1.26	2.558E-02				
338.65	356.	10.97	1.50	2.499E-02	338.40	12.010	7.363E-01	AC228
352.08	679.	5.63	1.46	2.425E-02	351.99	37.100	4.695E-01	PB214
463.25	116.	22.04	1.05	1.954E-02				
463.25	116.	22.04	1.05	1.954E-02	463.51	10.000	3.656E-01	SB125
510.82	259.	12.54	1.90	1.808E-02	510.72	22.500	3.474E-01	TL208
583.41	520.	6.40	1.93	1.628E-02	583.14	86.000	2.308E-01	TL208
609.54	491.	6.77	1.61	1.574E-02	609.32	46.090	4.206E-01	BI214
727.58	159.	16.00	1.41	1.374E-02	727.17	11.800	6.091E-01	BI212
785.05	86.	25.13	1.72	1.297E-02	785.42	2.000	2.037E+00	BI212
794.87	128.	18.68	1.41	1.285E-02				
794.87	128.	18.68	1.41	1.285E-02	795.76	85.400	7.374E-02	CS134

911.53	387.	6.86	2.02	1.160E-02	911.07	29.000	7.138E-01	AC228
964.72	62.	21.51	1.80	1.113E-02				
969.19	220.	8.46	1.80	1.109E-02	968.90	17.460	7.035E-01	AC228
1120.40	128.	14.27	2.03	9.969E-03	1120.28	15.040	5.324E-01	BI214
1461.05	1770.	2.42	2.29	8.190E-03	1460.75	10.700	1.263E+01	K40
1620.69	20.	31.93	1.63	7.569E-03	1620.56	2.750	5.995E-01	BI212

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
1764.61	107.	11.36	2.51	7.084E-03	1764.51	15.920	5.961E-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
540.83	270.60	304.	147.	0.074	58.11	1.371	AC-228 s
599.98	300.18	376.	80.	0.040	120.56	0.799	PB-212 sM
656.46	328.42	374.	153.	0.077	70.93	1.262	RH-106M s
1589.30	794.87	182.	57.	0.028	108.57	1.411	AC-228 s
1929.66	964.79	55.	64.	0.032	61.96	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
HG-203	145.43	72.88	2756.	-194.	-0.097	118.09	1.500s
PB-212	149.29	74.81	884.	384.	0.192	35.89	1.178D
PB-212	153.89	77.11	956.	424.	0.212	29.10	1.179A
PB-214	153.89	77.11	1710.	205.	0.102	80.13	1.500A
EU-155	174.07	87.20	1743.	208.	0.104	87.72	1.500
TH-234	185.72	93.03	1739.	204.	0.102	85.77	1.500s
TH-234	185.70	93.02	1688.	199.	0.099	81.91	1.500s
RA-226	371.18	185.77	918.	249.	0.124	63.97	1.944s
TH-227	471.63	236.00	1548.	-181.	-0.091	94.78	1.500s
PB-212	476.89	238.63	460.	1332.	0.666	10.52	1.297D
RA-224	482.86	241.61	1279.	136.	0.068	112.67	1.500
PB-214	483.47	241.92	639.	223.	0.111	51.78	1.299D
PB-214	590.03	295.20	455.	328.	0.164	35.51	1.493
AC-228	676.92	338.65	368.	353.	0.176	32.92	1.496s
PB-214	703.77	352.08	284.	674.	0.337	16.88	1.457
SB-125	925.93	463.17	166.	87.	0.043	68.41	1.500s
TL-208	1021.23	510.82	255.	225.	0.113	37.62	1.898s
TL-208	1166.41	583.41	177.	516.	0.258	19.19	1.935s
BI-214	1218.66	609.54	179.	487.	0.243	20.30	1.611s
BI-212	1454.73	727.58	136.	158.	0.079	48.00	1.414s
BI-212	1569.67	785.05	109.	84.	0.042	75.40	1.719
CS-134	1590.02	795.23	87.	71.	0.035	65.87	1.684s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
AC-228	1822.62	911.53	98.	383.	0.192	20.57	2.025
EU-152	1933.55	966.99	354.	-71.	-0.036	117.93	1.796s
AC-228	1937.36	968.90	75.	217.	0.109	26.09	1.799D
BI-214	2240.37	1120.40	75.	127.	0.064	42.82	2.028s
K-40	2921.71	1461.05	20.	1765.	0.882	7.26	2.286
BI-212	3240.99	1620.69	8.	20.	0.010	95.80	1.631
BI-214	3528.86	1764.61	11.	107.	0.054	34.07	2.506s

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		5.1770E-02					
			477.56	5.177E-02	%(	2.655E-01 7.87E-02	G
K-40		1.2627E+01					
			1460.75	1.263E+01	(P	1.694E-01 3.06E-01	G
MN-54		1.1341E-02					
			834.81	1.134E-02	%(P	1.839E-02 5.69E-03	G
CO-57		-3.1991E-03					
			122.07	-3.199E-03	&(P	3.410E-02 1.02E-02	G K
			136.43	2.309E-02	% P	2.029E-01 6.06E-02	G
CO-60		-3.7126E-03					
			1332.51	-3.713E-03	&(P	2.944E-02 8.15E-03	G K
			1173.23	-9.868E-03	& P	4.009E-02 1.17E-02	G K
Sr-85		-2.0808E-02					
			514.00	-2.081E-02	%(	3.564E-02 1.09E-02	G
Kr-85		-4.4493E+02					
			513.99	-4.449E+02	%(P	7.234E+02 2.20E+02	G
Y-88		1.2285E-03					
			1836.01	1.229E-03	&(P	2.243E-02 6.02E-03	G K
			898.02	-2.213E-03	% P	3.161E-02 9.06E-03	G
NB-94		-1.3919E-03					
			871.10	-1.392E-03	&(P	2.115E-02 6.04E-03	G K
			702.50	3.124E-03	% P	2.620E-02 7.67E-03	G K

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
Ag-108M	-4.3759E-05						
		722.95	-4.376E-05	%(	2.927E-02	8.47E-03	G K
		614.37	-1.763E-02	%	3.206E-02	9.77E-03	G
		433.93	-3.576E-04	% P	1.957E-02	5.63E-03	G
CD-109	-2.3207E-02						
		88.04	-2.321E-02	%(P	1.063E+00	3.19E-01	G
SN-113	8.6074E-03						
		391.71	8.607E-03	%(P	3.682E-02	1.10E-02	G K
		255.04	2.958E-02	&	8.420E-01	2.47E-01	G
SB-125	9.7594E-02						
		427.95	3.577E-02	&(P	5.382E-02	1.66E-02	G K
		600.77	2.872E-02	& P	1.175E-01	3.47E-02	G
		636.15	-7.325E-03	% P	2.104E-01	6.08E-02	G
		463.51	2.806E-01	@(P	2.033E-01	6.61E-02	G
		176.29	-6.190E-02	& P	4.034E-01	1.21E-01	G
I-131	-7.0656E-03						
		364.48	-7.066E-03	&(	7.613E-02	2.25E-02	G K
		636.97	2.458E-01	&	8.578E-01	2.55E-01	G
		284.29	-1.619E-02	%	9.727E-01	2.87E-01	G
CS-134	-1.8915E-02						
		604.66	-1.891E-02	%(P	3.117E-02	9.52E-03	G K
		795.76	4.093E-02	+ P	2.677E-02	9.06E-03	G
		569.29	2.472E-02	%	1.493E-01	4.40E-02	G
		801.84	-1.163E-02	% P	2.442E-01	6.97E-02	G
CS-137	4.0472E-03						
		661.62	4.047E-03	&(P	2.949E-02	8.60E-03	G
CE-139	-3.1361E-04						
		165.85	-3.136E-04	&(P	3.238E-02	9.64E-03	G
EU-152	-3.6753E-04						
		121.78	-3.675E-04	&(P	8.814E-02	2.63E-02	G K
		344.30	-1.960E-02	% P	7.624E-02	2.27E-02	G
		1408.08	4.191E-02	% P	1.100E-01	3.27E-02	G
		964.00	-2.753E-01	+ P	3.499E-01	1.08E-01	G
		1112.07	-4.397E-02	% P	2.516E-01	7.37E-02	G
		778.90	1.005E-02	& P	1.932E-01	5.59E-02	G
EU-154	6.5528E-03						
		123.10	6.553E-03	&(P	6.952E-02	2.08E-02	G K
		1274.80	1.098E-02	& P	8.133E-02	2.35E-02	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          723.30-8.567E-02 % P 1.689E-01 5.13E-02 G
                         1004.80-5.233E-02 & P 1.566E-01 4.66E-02 G

EU-155       1.2182E-01
                           86.45 1.218E-01  (  1.156E-01 3.56E-02 G K
                          105.31 2.632E-02 & P 1.408E-01 4.23E-02 G

HG-203      -6.4075E-03
                          279.17-6.408E-03 &(P 3.556E-02 1.06E-02 G K
                           72.87-8.308E-01 + P 1.062E+00 3.24E-01 G
                           70.83 5.749E-01 %   1.550E+00 4.69E-01 G
                           82.50-7.559E-01 %   2.170E+00 6.56E-01 G

TL-208       2.3082E-01
                          583.14 2.308E-01  (P 2.899E-02 1.49E-02 G
                          510.72 3.474E-01 + P 1.188E-01 5.01E-02 G

PB-212       6.0770E-01
                          238.63 6.077E-01  (P 4.682E-02 2.16E-02 G K
                                                          Energy duplication
                           77.11 5.141E-01 }   1.778E-01 4.99E-02 G
                           74.81 8.793E-01 + P 3.239E-01 1.06E-01 G

PB-214       4.6954E-01
                          351.99 4.695E-01  (P 5.662E-02 2.66E-02 G K
                          295.22 3.870E-01 - P 1.205E-01 4.64E-02 G
                                                          Energy duplication
                           77.11 4.053E-01 } P 3.872E-01 1.08E-01 G
                          241.92 5.916E-01 + P 3.198E-01 1.03E-01 G

BI-212       6.0727E-01
                          727.17 6.091E-01 *(P 2.210E-01 9.83E-02 G K
                         1620.56 5.995E-01  (P 4.813E-01 1.96E-01 G
                          785.42 2.037E+00 + P 1.241E+00 5.20E-01 G

BI-214       4.2062E-01
                          609.32 4.206E-01  (P 5.628E-02 2.87E-02 G K
                         1764.51 5.961E-01 + P 1.002E-01 6.83E-02 G
                         1120.28 5.324E-01 + P 1.798E-01 7.65E-02 G

RA-224       6.8933E-01
                          241.00 6.893E-01  (P 8.591E-01 2.63E-01 G

RA-226       1.3186E+00
                          185.99 1.319E+00 *(  7.621E-01 2.81E-01 G

AC-228       7.1534E-01
                          911.07 7.138E-01  (P 9.091E-02 4.95E-02 G K
                          968.90 7.036E-01  (P 1.392E-01 6.18E-02 G
                          338.40 7.363E-01 *(P 1.924E-01 8.16E-02 G
```

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 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments

TH-227      -3.1638E-01
                          236.00-3.164E-01 &(P 3.244E-01 9.98E-02 G K
                          256.25 5.162E-02 % P 3.404E-01 1.01E-01 G

PA-234      -1.6293E-02
                           98.44-1.629E-02 %(  1.272E-01 3.82E-02 G K
                          946.00 2.386E-02 &   1.168E-01 3.41E-02 G
                          131.28-3.149E-04 &   1.194E-01 3.56E-02 G
                           94.67-6.717E-02 %   2.251E-01 6.79E-02 G
                          883.24-2.572E-02 &   2.005E-01 5.82E-02 G
                          926.70 1.197E-01 &   1.846E-01 5.74E-02 G
                          569.26 3.628E-02 %   2.189E-01 6.45E-02 G

TH-234       9.4711E-01
                           63.29 4.142E-01 %(P 1.486E+00 4.47E-01 G K
                           92.80 1.208E+00  (P 1.180E+00 3.62E-01 G
                           92.38 1.452E+00  (P 1.402E+00 4.31E-01 G

AM-241      -3.4456E-02
                           59.54-3.446E-02 %(P 1.987E-01 5.97E-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

- -

***** 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	4.4044E-02	5.1770E-02	2.3623E-01	2.3625E-01	2.259E-01
K-40		1.2627E+01	1.2627E+01	9.1899E-01	1.1835E+00	
MN-54	#A	1.1032E-02	1.1341E-02	1.7063E-02	1.7076E-02	1.789E-02
CO-57	#B	-3.0985E-03	-3.1991E-03	3.1718E-02	3.1719E-02	3.303E-02
CO-60	#B	-3.6960E-03	-3.7126E-03	1.5519E-01	1.5519E-01	2.931E-02
Sr-85	#A	-1.8215E-02	-2.0808E-02	3.2633E-02	3.2657E-02	3.120E-02
Kr-85	#A	-4.4489E+02	-4.4493E+02	7.3562E+02	7.3609E+02	7.234E+02
Y-88	#B	1.1330E-03	1.2285E-03	1.8065E-02	1.8065E-02	2.069E-02
NB-94	#B	-1.3919E-03	-1.3919E-03	2.0072E-02	2.0072E-02	2.115E-02
Ag-108M	#B	-4.3751E-05	-4.3759E-05	2.5411E-02	2.5411E-02	2.926E-02
CD-109	#A	-2.2769E-02	-2.3207E-02	1.0994E+00	1.0994E+00	1.043E+00
SN-113	#B	7.9856E-03	8.6074E-03	3.2859E-02	3.2863E-02	3.416E-02
SB-125	#F	9.6765E-02	9.7594E-02	6.8936E-02	6.9177E-02	5.336E-02
I-131	#B	-2.4153E-03	-7.0656E-03	6.7404E-02	6.7405E-02	2.602E-02
CS-134	#B	-1.8699E-02	-1.8915E-02	2.9228E-02	2.9249E-02	3.081E-02
CS-137	#A	4.0440E-03	4.0472E-03	2.5811E-02	2.5812E-02	2.947E-02
CE-139	#A	-2.9453E-04	-3.1361E-04	4.7483E-02	4.7483E-02	3.041E-02
EU-152	#B	-3.6685E-04	-3.6753E-04	1.2153E-01	1.2153E-01	8.797E-02
EU-154	#B	6.5346E-03	6.5528E-03	6.2467E-02	6.2468E-02	6.932E-02
EU-155	#	1.2124E-01	1.2182E-01	1.0686E-01	1.0707E-01	1.151E-01
HG-203	#B	-5.3241E-03	-6.4075E-03	3.6238E-02	3.6240E-02	2.954E-02
TL-208		2.3082E-01	2.3082E-01	4.4693E-02	4.6726E-02	
PB-212		6.0770E-01	6.0770E-01	6.4713E-02	7.3999E-02	
PB-214		4.6954E-01	4.6954E-01	7.9875E-02	8.4552E-02	
BI-212		6.0727E-01	6.0727E-01	2.9386E-01	2.9604E-01	
BI-214	#	4.2062E-01	4.2062E-01	8.6132E-02	8.9643E-02	
RA-224	#A	6.8933E-01	6.8933E-01	7.8945E-01	7.9050E-01	8.591E-01
RA-226	#	1.3186E+00	1.3186E+00	8.4358E-01	8.4717E-01	
AC-228		7.1534E-01	7.1534E-01	1.1263E-01	1.2029E-01	
TH-227	#A	-3.1638E-01	-3.1638E-01	3.0032E-01	3.0091E-01	3.244E-01
PA-234	#B	-1.6293E-02	-1.6293E-02	1.1455E-01	1.1455E-01	1.272E-01
TH-234	#B	9.4711E-01	9.4711E-01	8.4404E-01	8.4567E-01	1.486E+00
AM-241	#A	-3.4454E-02	-3.4456E-02	1.8641E-01	1.8642E-01	1.987E-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 (1120.2 to 2000.1 keV) 1.6996637E+01 pCi/gm
Total Decayed Activity (1120.2 to 2000.1 keV) 1.6996656E+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_8AUG2006_1940.An1

Sample description
FSS-OOL-10-04-006-F

Spectrum Filename: C:\GammaVision\Spectra\107F_8AUG2006_1940.An1

Acquisition information
Start time: 08-Aug-2006 19:40:56
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: 2.1730E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 2.1730E+03) =
4.6019E+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	27-Jul-2006 08:33:00
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: 0.1614

***** 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	342.	13.62	1.18	2.849E-02	74.81	9.600	7.772E-01	PB212
77.13	536.	7.39	1.18	2.957E-02	77.11	10.700	1.108E+00	PB214
					77.11	17.500	6.833E-01	PB212
87.08	156.	40.41	1.50	3.284E-02	86.45	32.740	PBC<MDA	EU155
					88.04	3.790	PBC<MDA	CD109
87.10	145.	40.47	1.50	3.327E-02	86.45	32.740	PBC<MDA	EU155
					88.04	3.790	PBC<MDA	CD109
129.20	170.	32.93	1.28	3.818E-02				
186.24	228.	20.95	1.45	3.608E-02	185.99	3.280	1.195E+00	RA226
209.29	163.	28.06	1.71	3.429E-02				
238.76	1414.	3.47	1.30	3.187E-02	238.63	43.100	6.326E-01	PB212
241.53	287.	12.89	1.30	3.165E-02	241.00	3.900	1.435E+00	RA224
					241.92	7.470	7.529E-01	PB214
277.36	106.	29.78	1.63	2.892E-02				
277.36	106.	29.78	1.63	2.892E-02	279.17	81.500	3.340E-02	HG203
295.39	342.	8.37	1.34	2.766E-02	295.22	19.200	3.945E-01	PB214
300.23	73.	32.21	1.34	2.734E-02				
328.26	78.	39.82	1.58	2.559E-02				
338.62	339.	11.34	1.54	2.499E-02	338.40	12.010	6.954E-01	AC228
352.03	772.	6.30	1.63	2.426E-02	351.99	37.100	5.297E-01	PB214
463.60	125.	21.43	2.04	1.952E-02	463.51	10.000	3.915E-01	SB125
510.96	223.	14.29	1.93	1.807E-02	510.72	22.500	2.901E-01	TL208
583.29	464.	7.45	1.77	1.629E-02	583.14	86.000	2.039E-01	TL208
609.39	521.	6.66	1.72	1.574E-02	609.32	46.090	4.429E-01	BI214
661.85	185.	19.45	2.22	1.477E-02	661.62	84.620	9.056E-02	CS137
727.56	118.	16.18	1.96	1.374E-02	727.17	11.800	4.457E-01	BI212
795.21	42.	38.51	1.68	1.284E-02	795.76	85.400	PBC<MDA	CS134

860.75	102.	22.54	1.75	1.211E-02				
911.48	365.	7.66	1.70	1.160E-02	911.07	29.000	6.657E-01	AC228
968.98	256.	10.52	1.93	1.109E-02	968.90	17.460	8.151E-01	AC228
1121.23	160.	13.80	2.83	9.970E-03	1120.28	15.040	6.624E-01	BI214
1461.07	2009.	2.32	2.24	8.190E-03	1460.75	10.700	1.422E+01	K40

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
1621.00	18.	32.28	0.65	7.569E-03	1620.56	2.750	5.288E-01	BI212
1764.60	111.	9.49	2.54	7.083E-03	1764.51	15.920	6.072E-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
258.06	129.20	1118.	186.	0.093	79.22	1.284	AC-228
418.22	209.29	746.	163.	0.082	84.17	1.710	AC-228 s
600.07	300.24	244.	73.	0.037	96.64	1.341	PB-212 lD
656.14	328.26	339.	78.	0.039	119.46	1.578	RH-106M s
1721.06	860.75	120.	102.	0.051	54.15	1.749	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	149.29	74.81	939.	342.	0.171	40.85	1.178D
PB-212	153.89	77.11	1019.	536.	0.268	22.17	1.179A
EU-155	173.83	87.08	1913.	156.	0.078	121.24	1.500
CD-109	173.87	87.10	1654.	145.	0.072	121.42	1.500
RA-226	372.12	186.24	818.	228.	0.114	62.85	1.451s
TH-227	471.72	236.04	1488.	-174.	-0.087	96.96	1.500s
PB-212	476.89	238.63	442.	1391.	0.696	10.14	1.297D
PB-214	483.47	241.92	616.	267.	0.133	43.31	1.299D
HG-203	553.94	277.16	349.	89.	0.045	92.65	1.500s
PB-214	590.45	295.41	353.	333.	0.167	29.99	1.440
AC-228	676.86	338.62	383.	336.	0.168	34.03	1.539
PB-214	703.67	352.03	434.	767.	0.383	18.89	1.629s
SB-125	926.59	463.50	213.	75.	0.038	85.59	1.500s
TL-208	1021.03	510.72	367.	213.	0.107	48.26	1.950s
TL-208	1166.15	583.29	202.	459.	0.230	22.34	1.774
BI-214	1218.37	609.39	199.	517.	0.258	19.98	1.720
Ag-108M	1222.69	611.56	319.	-124.	-0.062	66.61	1.561s
CS-137	1323.27	661.85	269.	182.	0.091	58.36	2.217s
BI-212	1454.69	727.56	99.	116.	0.058	48.53	1.957s
CS-134	1589.99	795.21	115.	42.	0.021	115.54	1.684s
AC-228	1822.53	911.48	127.	360.	0.180	22.99	1.700
AC-228	1937.52	968.98	129.	254.	0.127	31.56	1.934

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
BI-214	2242.02	1121.23	104.	160.	0.080	41.41	2.833s
K-40	2921.74	1461.07	34.	2004.	1.002	6.97	2.245
BI-212	3241.62	1621.00	5.	18.	0.009	96.85	0.652s
BI-214	3528.85	1764.60	1.	110.	0.055	28.47	2.540

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		9.5823E-02					
			477.56	9.582E-02	%(	2.231E-01 6.74E-02	G
K-40		1.4223E+01					
			1460.75	1.422E+01	(P	2.107E-01 3.31E-01	G
MN-54		-5.1093E-03					
			834.81	-5.109E-03	&(P	2.982E-02 8.76E-03	G
CO-57		-5.9386E-03					
			122.07	-5.939E-03	%(P	3.316E-02 9.96E-03	G K
			136.43	9.726E-05	% P	2.734E-01 8.17E-02	G
CO-60		-2.8161E-03					
			1332.51	-2.816E-03	%(P	2.183E-02 5.72E-03	G K
			1173.23	-1.793E-03	% P	3.717E-02 1.06E-02	G K
Sr-85		-1.9653E-02					
			514.00	-1.965E-02	%(	3.683E-02 1.12E-02	G
Kr-85		-4.2117E+02					
			513.99	-4.212E+02	%(P	7.472E+02 2.26E+02	G
Y-88		1.6013E-03					
			1836.01	1.601E-03	%(P	1.861E-02 4.92E-03	G K
			898.02	-5.296E-03	% P	2.964E-02 8.58E-03	G
NB-94		-3.7583E-05					
			871.10	-3.758E-05	%(P	2.488E-02 7.12E-03	G K
			702.50	4.973E-03	% P	2.445E-02 7.20E-03	G K
Ag-108M		-1.3844E-02					
			722.95	-1.384E-02	&(	3.666E-02 1.10E-02	G K
			614.37	-5.470E-02	+	3.781E-02 1.21E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
		433.93	-2.447E-03	% P	2.511E-02	7.36E-03	G
CD-109	7.2837E-01						
		88.04	7.284E-01	&(P	9.666E-01	2.95E-01	G
SN-113	-1.2137E-03						
		391.71	-1.214E-03	&(P	3.949E-02	1.16E-02	G K
		255.04	3.773E-01	&	1.173E+00	3.53E-01	G
SB-125	8.1036E-02						
		427.95	2.649E-02	%(P	7.385E-02	2.22E-02	G K
		600.77	-5.724E-04	& P	1.421E-01	4.13E-02	G
		636.15	2.443E-02	% P	1.690E-01	4.91E-02	G
		463.51	2.425E-01	*(P	2.273E-01	7.18E-02	G
		176.29	8.188E-02	% P	3.505E-01	1.05E-01	G
I-131	1.2805E-02						
		364.48	1.280E-02	%(	7.315E-02	2.17E-02	G K
		636.97	3.437E-01	%	7.858E-01	2.37E-01	G
		284.29	-1.204E-02	&	1.110E+00	3.28E-01	G
CS-134	1.2411E-02						
		604.66	2.032E-03	%(P	5.735E-02	1.71E-02	G K
		795.76	2.427E-02	*(P	3.025E-02	9.46E-03	G
		569.29	-6.417E-03	&	1.538E-01	4.48E-02	G
		801.84	-1.515E-02	& P	3.056E-01	8.85E-02	G
CS-137	9.0556E-02						
		661.62	9.056E-02	*(P	3.941E-02	1.80E-02	G
CE-139	-1.0176E-03						
		165.85	-1.018E-03	&(P	3.502E-02	1.05E-02	G
EU-152	-1.5620E-02						
		121.78	-1.562E-02	%(P	9.691E-02	2.91E-02	G K
		344.30	-1.669E-02	% P	7.538E-02	2.24E-02	G
		1408.08	5.154E-02	% P	9.170E-02	2.82E-02	G
		964.00	5.224E-02	% P	2.604E-01	7.72E-02	G
		1112.07	-1.917E-02	% P	2.345E-01	6.78E-02	G
		778.90	4.029E-03	% P	1.498E-01	4.25E-02	G
EU-154	1.7089E-02						
		123.10	1.709E-02	&(P	5.541E-02	1.67E-02	G K
		1274.80	-4.925E-04	% P	8.845E-02	2.52E-02	G
		723.30	6.973E-03	& P	2.281E-01	6.75E-02	G
		1004.80	1.924E-02	% P	1.502E-01	4.36E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
EU-155	9.0749E-02						
		86.45	9.075E-02	(	1.200E-01	3.67E-02	G K
		105.31	2.903E-02	% P	1.247E-01	3.75E-02	G
HG-203	2.8534E-02						
		279.17	2.853E-02	&(P	2.862E-02	8.94E-03	G K
		72.87	-7.260E-01	% P	1.060E+00	3.23E-01	G
		70.83	5.838E-01	%	1.485E+00	4.49E-01	G
		82.50	-8.190E-01	%	2.159E+00	6.53E-01	G
TL-208	2.0391E-01						
		583.14	2.039E-01	(P	3.058E-02	1.53E-02	G
		510.72	3.261E-01	+ P	1.405E-01	6.08E-02	G
PB-212	6.4490E-01						
		238.63	6.293E-01	(P	4.554E-02	2.15E-02	G K
							Energy duplication
		77.11	6.439E-01	}	1.820E-01	4.76E-02	G
		74.81	7.772E-01	+ P	3.308E-01	1.07E-01	G
PB-214	5.2971E-01						
		351.99	5.297E-01	*(P	6.899E-02	3.36E-02	G K
		295.22	3.898E-01	- P	1.056E-01	3.95E-02	G
							Energy duplication
		77.11	5.166E-02	} P	3.883E-01	1.10E-01	G
		241.92	7.018E-01	+ P	3.116E-01	1.02E-01	G
BI-212	4.6137E-01						
		727.17	4.457E-01	*(P	1.880E-01	7.29E-02	G K
		1620.56	5.288E-01	(P	4.016E-01	1.76E-01	G
		785.42	5.595E-01	% P	1.191E+00	3.60E-01	G
BI-214	4.4285E-01						
		609.32	4.429E-01	(P	5.871E-02	2.97E-02	G K
		1764.51	6.072E-01	+ P	4.064E-02	5.81E-02	G
		1120.28	6.624E-01	+ P	2.086E-01	9.20E-02	G
RA-224	6.4107E-01						
		241.00	6.411E-01	%(P	8.778E-01	2.68E-01	G
RA-226	1.1948E+00						
		185.99	1.195E+00	(	7.140E-01	2.50E-01	G
AC-228	7.1643E-01						
		911.07	6.657E-01	(P	1.019E-01	5.16E-02	G K
		968.90	8.151E-01	(P	1.787E-01	8.65E-02	G
		338.40	6.954E-01	(P	1.945E-01	7.97E-02	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments

TH-227      -3.0075E-01
                          236.00-3.007E-01 &(P 3.156E-01 9.70E-02 G K
                          256.25-6.249E-02 & P 3.662E-01 1.09E-01 G

PA-234      -5.6167E-02
                           98.44-5.617E-02 &(  1.150E-01 3.49E-02 G K
                          946.00 1.150E-02 &   1.253E-01 3.62E-02 G
                          131.28-1.393E-02 &   1.452E-01 4.35E-02 G
                           94.67-2.212E-03 %   2.163E-01 6.47E-02 G
                          883.24-7.051E-02 %   2.335E-01 6.95E-02 G
                          926.70-5.464E-02 %   2.623E-01 7.73E-02 G
                          569.26-6.778E-03 &   2.187E-01 6.36E-02 G

TH-234       5.0201E-01
                           63.29 5.020E-01 %(P 1.401E+00 4.22E-01 G K
                           92.80 7.413E-01 % P 1.196E+00 3.63E-01 G
                           92.38 7.130E-01 % P 1.435E+00 4.35E-01 G

AM-241      -1.0056E-03
                           59.54-1.006E-03 %(P 1.552E-01 4.62E-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	8.1509E-02	9.5823E-02	2.0206E-01	2.0214E-01	1.898E-01
K-40		1.4223E+01	1.4223E+01	9.9304E-01	1.3007E+00	
MN-54	#A	-4.9699E-03	-5.1093E-03	2.8654E-02	2.8656E-02	2.901E-02
CO-57	#B	-5.7516E-03	-5.9386E-03	3.0431E-02	3.0433E-02	3.212E-02
CO-60	#B	-2.8035E-03	-2.8161E-03	6.9025E-01	6.9025E-01	2.173E-02
Sr-85	#A	-1.7201E-02	-1.9653E-02	3.3615E-02	3.3635E-02	3.224E-02
Kr-85	#A	-4.2113E+02	-4.2117E+02	7.6157E+02	7.6198E+02	7.471E+02
Y-88	#B	1.4767E-03	1.6013E-03	1.4745E-02	1.4746E-02	1.716E-02
NB-94	#B	-3.7583E-05	-3.7583E-05	7.0162E-02	7.0162E-02	2.488E-02
Ag-108M	#B	-1.3842E-02	-1.3844E-02	3.3100E-02	3.3110E-02	3.665E-02
CD-109	#A	7.1462E-01	7.2837E-01	8.8636E-01	8.8728E-01	9.483E-01
SN-113	#B	-1.1259E-03	-1.2137E-03	1.9633E-01	1.9633E-01	3.664E-02
SB-125	#F	8.0347E-02	8.1036E-02	7.1944E-02	7.2103E-02	7.322E-02
I-131	#B	4.3723E-03	1.2805E-02	6.5103E-02	6.5107E-02	2.498E-02
CS-134	#B	1.2269E-02	1.2411E-02	1.4518E-02	1.4537E-02	5.669E-02
CS-137	#	9.0485E-02	9.0556E-02	5.3878E-02	5.4143E-02	
CE-139	#A	-9.5563E-04	-1.0176E-03	3.6391E-02	3.6391E-02	3.289E-02
EU-152	#B	-1.5591E-02	-1.5620E-02	8.8165E-02	8.8169E-02	9.673E-02
EU-154	#B	1.7042E-02	1.7089E-02	5.0063E-02	5.0072E-02	5.525E-02
EU-155	#A	9.0318E-02	9.0749E-02	1.1003E-01	1.1014E-01	1.195E-01
HG-203	#A	2.3704E-02	2.8534E-02	2.6821E-02	2.6874E-02	2.378E-02
TL-208		2.0391E-01	2.0391E-01	4.6001E-02	4.7551E-02	
PB-212		6.4490E-01	6.4490E-01	6.6105E-02	7.6292E-02	
PB-214		5.2971E-01	5.2971E-01	1.0071E-01	1.0545E-01	
BI-212		4.6137E-01	4.6137E-01	2.2637E-01	2.2800E-01	
BI-214		4.4285E-01	4.4285E-01	8.9205E-02	9.2960E-02	
RA-224	#A	6.4107E-01	6.4107E-01	8.0469E-01	8.0558E-01	8.778E-01
RA-226	#	1.1948E+00	1.1948E+00	7.5088E-01	7.5418E-01	
AC-228		7.1643E-01	7.1643E-01	1.2489E-01	1.3187E-01	
TH-227	#A	-3.0075E-01	-3.0075E-01	2.9205E-01	2.9259E-01	3.156E-01
PA-234	#B	-5.6167E-02	-5.6167E-02	1.0466E-01	1.0470E-01	1.150E-01
TH-234	#B	5.0201E-01	5.0201E-01	1.2664E+00	1.2667E+00	1.401E+00
AM-241	#A	-1.0056E-03	-1.0056E-03	7.2266E-01	7.2266E-01	1.552E-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) 1.8507387E+01 pCi/gm
Total Decayed Activity (277.2 to 2000.1 keV) 1.8507477E+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_14AUG2006_0927.An1

Sample description
FSS-OOL-10-04-018-F

Spectrum Filename: C:\GammaVision\Spectra\107F_14AUG2006_0927.An1

Acquisition information
Start time: 07-Aug-2006 09:28:22
Live time: 2000
Real time: 2003
Dead time: 0.16 %
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: 2.1310E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 2.1310E+03) =
4.6926E+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	27-Jul-2006 08:07:00
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. 23 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.1571

***** 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
63.65	166.	38.67	0.82	2.050E-02	63.29	3.900	PBC<MDA	TH234
74.79	428.	11.47	1.18	2.849E-02	74.81	9.600	9.915E-01	PB212
77.09	607.	6.98	1.18	2.957E-02	77.11	10.700	1.420E+00	PB214
					77.11	17.500	8.743E-01	PB212
87.16	216.	30.79	1.50	3.284E-02	86.45	32.740	PBC<MDA	EU155
					88.04	3.790	1.106E+00	CD109
87.67	223.	20.69	1.19	3.327E-02	86.45	32.740	PBC<MDA	EU155
					88.04	3.790	1.140E+00	CD109
89.55	152.	31.01	1.19	3.373E-02				
92.76	281.	15.76	1.19	3.445E-02	92.38	2.570	1.965E+00	TH234
					92.80	3.000	1.607E+00	TH234
92.91	236.	25.39	1.50	3.438E-02	92.38	2.570	1.696E+00	TH234
					92.80	3.000	1.449E+00	TH234
92.92	240.	26.62	1.50	3.429E-02	92.38	2.570	1.725E+00	TH234
					92.80	3.000	PBC<MDA	TH234
128.73	177.	33.07	1.57	3.817E-02				
185.81	243.	22.80	1.34	3.611E-02	185.99	3.280	1.303E+00	RA226
209.26	166.	27.85	1.28	3.429E-02				
238.69	1633.	3.04	1.30	3.189E-02	238.63	43.100	7.463E-01	PB212
242.00	240.	15.55	1.30	3.162E-02	241.00	3.900	1.221E+00	RA224
					241.92	7.470	6.413E-01	PB214
270.00	178.	26.83	1.72	2.946E-02				
295.32	480.	6.44	1.34	2.768E-02	295.22	19.200	5.678E-01	PB214
300.37	152.	15.98	1.34	2.734E-02				
327.96	102.	35.51	1.56	2.561E-02				
338.61	395.	10.54	1.41	2.499E-02	338.40	12.010	8.282E-01	AC228
351.93	860.	4.99	1.55	2.426E-02	351.99	37.100	6.022E-01	PB214

462.81	115.	23.37	1.38	1.955E-02				
462.81	115.	23.37	1.38	1.955E-02	463.51	10.000	3.677E-01	SB125
510.32	292.	12.61	2.07	1.809E-02	510.72	22.500	4.027E-01	TL208
583.28	662.	6.22	1.60	1.629E-02	583.14	86.000	2.976E-01	TL208
609.34	549.	6.23	1.58	1.574E-02	609.32	46.090	4.764E-01	BI214
662.92	125.	21.53	1.58	1.475E-02	661.62	84.620	6.187E-02	CS137

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
727.39	191.	16.33	1.70	1.374E-02	727.17	11.800	7.415E-01	BI212
784.42	88.	26.23	1.13	1.298E-02	785.42	2.000	2.111E+00	BI212
795.12	48.	37.05	1.68	1.284E-02	795.76	85.400	PBC<MDA	CS134
835.10	44.	39.61	1.31	1.238E-02	834.81	99.978	PBC<MDA	MN54
860.24	96.	16.87	1.94	1.211E-02				
911.29	423.	6.47	1.77	1.161E-02	911.07	29.000	7.889E-01	AC228
964.92	73.	19.02	1.80	1.113E-02				
969.03	273.	7.30	1.80	1.109E-02	968.90	17.460	8.864E-01	AC228
1120.37	174.	16.20	1.66	9.969E-03	1120.28	15.040	7.304E-01	BI214
1460.76	2104.	2.26	2.35	8.191E-03	1460.75	10.700	1.519E+01	K40
1620.56	33.	27.42	0.67	7.569E-03	1620.56	2.750	9.962E-01	BI212
1764.57	135.	9.69	1.07	7.083E-03	1764.51	15.920	7.541E-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	
126.98	63.65	1525.	166.	0.083	116.01	0.817	PA-234	l
178.76	89.92	1042.	152.	0.076	93.02	1.189	PB-214	D
185.19	93.13	840.	281.	0.141	47.27	1.191	U-235	D
418.16	209.26	794.	166.	0.083	83.55	1.285	AC-228	
539.62	270.00	682.	178.	0.089	80.50	1.725	AC-228	s
600.18	300.28	378.	132.	0.066	74.59	1.203	PB-212	M
655.54	327.96	434.	102.	0.051	106.52	1.561	AC-228	s
1669.76	835.10	106.	44.	0.022	118.84	1.315	KR-88	l
1720.05	860.24	64.	96.	0.048	50.62	1.939	TL-208	s
1929.83	965.01	61.	73.	0.036	57.65	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	1013.	428.	0.214	34.41	1.178D
PB-212	153.89	77.11	1069.	607.	0.304	20.93	1.179A
EU-155	173.99	87.16	2113.	216.	0.108	92.37	1.500
CD-109	175.74	88.04	954.	223.	0.111	62.06	1.187D
TH-234	185.50	92.92	2058.	240.	0.120	79.87	1.500s
TH-234	185.48	92.91	1995.	236.	0.118	76.17	1.500s
RA-226	371.27	185.81	1051.	243.	0.122	68.40	1.340s
PB-212	476.89	238.63	437.	1613.	0.807	9.15	1.297D

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
PB-214	483.47	241.92	579.	240.	0.120	46.39	1.299D
PB-214	590.10	295.24	735.	658.	0.329	26.57	1.228
AC-228	676.83	338.61	436.	392.	0.196	31.62	1.410
PB-214	703.47	351.93	343.	855.	0.427	14.97	1.554
SB-125	925.78	463.09	207.	101.	0.051	65.21	1.500
TL-208	1020.23	510.32	314.	258.	0.129	37.83	2.070s
TL-208	1166.14	583.28	263.	657.	0.329	18.65	1.604
BI-214	1218.25	609.34	193.	545.	0.273	18.69	1.583
CS-137	1325.42	662.92	181.	122.	0.061	64.60	1.581s
BI-212	1454.36	727.39	201.	190.	0.095	48.98	1.702
BI-212	1568.40	784.42	135.	86.	0.043	78.68	1.127s
CS-134	1589.80	795.12	139.	48.	0.024	111.16	1.684s
AC-228	1822.15	911.29	109.	419.	0.209	19.40	1.769
AC-228	1937.36	968.90	75.	271.	0.135	22.51	1.799D
BI-214	2240.31	1120.37	163.	173.	0.086	48.59	1.662s
K-40	2921.12	1460.76	41.	2099.	1.050	6.79	2.349
BI-212	3240.74	1620.56	11.	33.	0.016	82.26	0.675s
BI-214	3528.79	1764.57	10.	134.	0.067	29.06	1.073s

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		-1.9164E-02					
			477.56	-1.916E-02	%(	2.796E-01 8.22E-02	G
K-40		1.5189E+01					
			1460.75	1.519E+01	(P	2.348E-01 3.45E-01	G
MN-54		1.1088E-02					
			834.81	1.109E-02	%(P	3.101E-02 9.29E-03	G
CO-57		-1.0936E-02					
			122.07	-1.094E-02	%(P	3.491E-02 1.05E-02	G K
			136.43	-2.599E-02	% P	2.895E-01 8.68E-02	G
CO-60		1.2726E-02					
			1332.51	1.273E-02	%(P	2.702E-02 8.07E-03	G K
			1173.23	-2.328E-03	& P	4.240E-02 1.22E-02	G K
Sr-85		-6.1336E-03					
			514.00	-6.134E-03	&(	3.638E-02 1.08E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
Kr-85	-1.5044E+02						
		513.99	-1.504E+02	&(P	7.493E+02	2.22E+02	G
Y-88	-7.7009E-04						
		1836.01	-7.701E-04	%(P	2.158E-02	5.59E-03	G K
		898.02	5.330E-03	% P	3.230E-02	9.44E-03	G
NB-94	-3.2799E-03						
		871.10	-3.280E-03	%(P	2.876E-02	8.39E-03	G K
		702.50	5.260E-03	& P	2.792E-02	8.24E-03	G K
Ag-108M	-1.9125E-02						
		722.95	-1.912E-02	&(	4.016E-02	1.22E-02	G K
		614.37	-2.497E-02	%	3.384E-02	1.05E-02	G
		433.93	8.745E-03	% P	2.436E-02	7.30E-03	G
CD-109	1.1398E+00						
		88.04	1.140E+00	(P	7.502E-01	2.36E-01	G
SN-113	7.3251E-03						
		391.71	7.325E-03	%(P	3.153E-02	9.34E-03	G K
		255.04	-2.883E-01	%	1.361E+00	4.08E-01	G
SB-125	8.2726E-02						
		427.95	-1.456E-03	%(P	8.298E-02	2.43E-02	G K
		600.77	-2.481E-02	% P	1.401E-01	4.11E-02	G
		636.15	3.088E-02	% P	2.251E-01	6.60E-02	G
		463.51	3.319E-01	(P	2.285E-01	7.41E-02	G
		176.29	1.270E-01	% P	4.314E-01	1.30E-01	G
I-131	1.6972E-03						
		364.48	1.697E-03	%(	6.931E-02	2.04E-02	G K
		636.97	-2.230E-01	&	9.959E-01	2.96E-01	G
		284.29	1.452E-01	%	1.036E+00	3.09E-01	G
CS-134	1.1315E-02						
		604.66	-3.418E-03	%(P	6.383E-02	1.91E-02	G K
		795.76	2.815E-02	*(P	3.369E-02	1.05E-02	G
		569.29	-1.209E-02	&	1.472E-01	4.30E-02	G
		801.84	5.351E-03	% P	3.709E-01	1.08E-01	G
CS-137	6.1871E-02						
		661.62	6.187E-02	*(P	3.322E-02	1.37E-02	G
CE-139	-5.4514E-03						
		165.85	-5.451E-03	&(P	3.737E-02	1.12E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
EU-152	-2.5303E-02						
		121.78	-2.530E-02	%(P	1.021E-01	3.08E-02	G K
		344.30	-1.321E-02	% P	7.978E-02	2.36E-02	G
		1408.08	5.934E-02	% P	1.106E-01	3.38E-02	G
		964.00	1.889E-03	% P	1.780E-01	5.08E-02	G
		1112.07	-3.073E-03	% P	2.141E-01	6.10E-02	G
		778.90	-3.431E-02	% P	2.113E-01	6.19E-02	G
EU-154	-4.1425E-04						
		123.10	-4.142E-04	%(P	7.778E-02	2.33E-02	G K
		1274.80	-5.219E-04	% P	9.497E-02	2.72E-02	G
		723.30	-4.230E-02	& P	1.858E-01	5.53E-02	G
		1004.80	4.402E-02	& P	1.569E-01	4.65E-02	G
EU-155	1.2821E-01						
		86.45	1.282E-01	(	1.285E-01	3.95E-02	G K
		105.31	3.700E-02	& P	1.478E-01	4.45E-02	G
HG-203	1.9218E-02						
		279.17	1.922E-02	%(P	3.136E-02	9.57E-03	G K
		72.87	-5.895E-01	% P	1.108E+00	3.36E-01	G
		70.83	-1.181E+00	%	1.774E+00	5.41E-01	G
		82.50	-7.252E-02	&	2.199E+00	6.59E-01	G
TL-208	2.9760E-01						
		583.14	2.976E-01	(P	3.540E-02	1.86E-02	G
		510.72	4.027E-01	+ P	1.329E-01	5.74E-02	G
PB-212	7.4418E-01						
		238.63	7.442E-01	(P	4.618E-02	2.29E-02	G K
							Energy duplication
		77.11	7.442E-01	}	1.900E-01	5.19E-02	G
		74.81	9.915E-01	+ P	3.502E-01	1.15E-01	G
PB-214	6.0934E-01						
		351.99	6.022E-01	(P	6.275E-02	3.02E-02	G K
		295.22	7.849E-01	+ P	1.540E-01	7.00E-02	G
							Energy duplication
		77.11	1.478E-01	} P	4.193E-01	1.13E-01	G
		241.92	6.447E-01	(P	3.082E-01	1.00E-01	G
BI-212	7.8961E-01						
		727.17	7.415E-01	(P	2.692E-01	1.22E-01	G K
		1620.56	9.962E-01	(P	5.599E-01	2.77E-01	G
		785.42	2.111E+00	+ P	1.389E+00	5.61E-01	G
BI-214	4.7640E-01						
		609.32	4.764E-01	(P	5.894E-02	2.99E-02	G K
		1764.51	7.541E-01	+ P	9.767E-02	7.35E-02	G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                         1120.28 7.304E-01 + P 2.633E-01 1.19E-01 G

RA-224       3.2225E-02
                          241.00 3.222E-02 %(P 8.376E-01 2.50E-01 G

RA-226       1.3035E+00
                          185.99 1.303E+00 *(  8.234E-01 2.97E-01 G

AC-228       8.2599E-01
                          911.07 7.889E-01  (P 9.685E-02 5.15E-02 G K
                          968.90 8.861E-01  (P 1.413E-01 6.70E-02 G
                          338.40 8.282E-01  (P 2.112E-01 8.80E-02 G

TH-227      -2.3353E-01
                          236.00-2.335E-01 &(P 3.460E-01 1.06E-01 G K
                          256.25-1.328E-02 & P 3.870E-01 1.15E-01 G

PA-234       7.5851E-04
                           98.44 7.585E-04 &(  1.371E-01 4.10E-02 G K
                          946.00-3.240E-02 %   1.460E-01 4.31E-02 G
                          131.28-1.619E-02 %   1.601E-01 4.80E-02 G
                           94.67-7.560E-02 %   2.543E-01 7.68E-02 G
                          883.24-2.938E-04 &   2.242E-01 6.44E-02 G
                          926.70-3.464E-02 %   2.669E-01 7.80E-02 G
                          569.26-1.849E-02 &   2.215E-01 6.47E-02 G

TH-234       1.2861E+00
                           63.29 8.718E-01 %(P 1.592E+00 4.83E-01 G K
                           92.80 1.449E+00  (P 1.296E+00 3.99E-01 G
                           92.38 1.725E+00  (P 1.541E+00 4.74E-01 G

AM-241      -3.3908E-02
                           59.54-3.391E-02 %(P 2.069E-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	

- -

***** 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	-1.6601E-02	-1.9164E-02	2.4665E-01	2.4665E-01	2.422E-01
K-40		1.5189E+01	1.5189E+01	1.0341E+00	1.3690E+00	
MN-54	#A	1.0819E-02	1.1088E-02	2.7876E-02	2.7884E-02	3.026E-02
CO-57	#B	-1.0630E-02	-1.0936E-02	3.1921E-02	3.1927E-02	3.393E-02
CO-60	#B	1.2675E-02	1.2726E-02	2.4196E-02	2.4208E-02	2.691E-02
Sr-85	#A	-5.4498E-03	-6.1336E-03	3.2476E-02	3.2478E-02	3.232E-02
Kr-85	#A	-1.5042E+02	-1.5044E+02	9.2578E+02	9.2582E+02	7.492E+02
Y-88	#B	-7.1667E-04	-7.7009E-04	6.2326E-01	6.2326E-01	2.008E-02
NB-94	#B	-3.2799E-03	-3.2799E-03	2.6299E-02	2.6300E-02	2.876E-02
Ag-108M	#B	-1.9121E-02	-1.9125E-02	3.6524E-02	3.6542E-02	4.015E-02
CD-109		1.1207E+00	1.1398E+00	7.0843E-01	7.1124E-01	
SN-113	#B	6.8532E-03	7.3251E-03	2.8032E-02	2.8035E-02	2.950E-02
SB-125	#B	8.2102E-02	8.2726E-02	5.5438E-02	5.5653E-02	8.235E-02
I-131	#B	6.5427E-04	1.6972E-03	6.1098E-02	6.1098E-02	2.672E-02
CS-134	#B	1.1201E-02	1.1315E-02	1.2716E-02	1.2733E-02	6.319E-02
CS-137	#	6.1828E-02	6.1871E-02	4.1130E-02	4.1292E-02	
CE-139	#A	-5.1559E-03	-5.4514E-03	3.4587E-02	3.4589E-02	3.535E-02
EU-152	#B	-2.5261E-02	-2.5303E-02	9.2865E-02	9.2876E-02	1.020E-01
EU-154	#B	-4.1323E-04	-4.1425E-04	2.3357E-01	2.3357E-01	7.758E-02
EU-155	#A	1.2767E-01	1.2821E-01	1.1843E-01	1.1864E-01	1.279E-01
HG-203	#B	1.6303E-02	1.9218E-02	2.8718E-02	2.8740E-02	2.660E-02
TL-208		2.9760E-01	2.9760E-01	5.5891E-02	5.8590E-02	
PB-212		7.4418E-01	7.4418E-01	6.8794E-02	8.1636E-02	
PB-214		6.0934E-01	6.0934E-01	9.1759E-02	9.8564E-02	
BI-212		7.8961E-01	7.8961E-01	3.8295E-01	3.8577E-01	
BI-214		4.7640E-01	4.7640E-01	8.9756E-02	9.4063E-02	
RA-224	#A	3.2225E-02	3.2225E-02	7.5059E-01	7.5059E-01	8.376E-01
RA-226	#	1.3035E+00	1.3035E+00	8.9164E-01	8.9495E-01	
AC-228		8.2599E-01	8.2599E-01	1.2049E-01	1.3000E-01	

TH-227 #B	-2.3353E-01	-2.3353E-01	3.1784E-01	3.1814E-01	3.460E-01

PA-234 #B	7.5851E-04	7.5851E-04	1.2308E-01	1.2308E-01	1.371E-01
TH-234 #B	1.2861E+00	1.2861E+00	8.7050E-01	8.7342E-01	1.592E+00
AM-241 #A	-3.3906E-02	-3.3908E-02	1.9432E-01	1.9433E-01	2.069E-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) 2.1418339E+01 pCi/gm
Total Decayed Activity (1120.2 to 2000.1 keV) 2.1437508E+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_27JUL2006_1708.An1

Sample description
FSS-OOL-10-04-017-F-S WET

Spectrum Filename: C:\GammaVision\Spectra\107F_27JUL2006_1708.An1

Acquisition information
Start time: 27-Jul-2006 17:08:10
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: 2.3450E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 2.3450E+03) =
4.2644E+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	27-Jul-2006 08:00:00
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. 22 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.2662

***** 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	459.	9.91	1.18	2.850E-02	74.81	9.600	9.596E-01	PB212
77.13	720.	6.81	1.18	2.959E-02	77.11	17.500	8.018E-01	PB212
					77.11	10.700	1.303E+00	PB214
84.54	114.	34.23	1.18	3.228E-02				
87.13	242.	16.51	1.19	3.302E-02	86.45	32.740	1.298E-01	EU155
					88.04	3.790	1.106E+00	CD109
89.53	156.	25.75	1.19	3.363E-02				
93.12	244.	16.37	1.19	3.444E-02	92.38	2.570	1.541E+00	TH234
					92.80	3.000	1.251E+00	TH234
186.07	212.	19.79	1.00	3.610E-02	185.99	3.280	1.031E+00	RA226
209.30	97.	30.64	1.14	3.428E-02				
238.80	1496.	3.07	1.30	3.188E-02	238.63	43.100	6.206E-01	PB212
241.63	277.	11.85	1.30	3.165E-02	241.00	3.900	1.279E+00	RA224
					241.92	7.470	6.713E-01	PB214
270.63	116.	26.89	1.86	2.942E-02				
295.38	321.	8.32	1.34	2.766E-02	295.22	19.200	3.429E-01	PB214
300.66	93.	22.94	1.34	2.731E-02				
328.57	120.	30.90	1.80	2.557E-02				
338.75	358.	10.45	1.17	2.498E-02	338.40	12.010	6.808E-01	AC228
352.13	615.	6.90	1.14	2.425E-02	351.99	37.100	3.905E-01	PB214
409.83	53.	31.22	1.33	2.153E-02				
463.09	121.	23.39	1.17	1.954E-02				
463.09	121.	23.39	1.17	1.954E-02	463.51	10.000	3.483E-01	SB125
511.05	190.	10.42	1.49	1.808E-02	510.72	22.500	2.221E-01	TL208
583.51	574.	5.82	1.40	1.628E-02	583.14	86.000	2.342E-01	TL208
609.70	460.	5.84	1.46	1.573E-02	609.32	46.090	3.621E-01	BI214
727.79	120.	21.34	1.31	1.373E-02	727.17	11.800	4.211E-01	BI212

786.08	44.	40.89	1.25	1.296E-02	785.42	2.000	PBC<MDA	BI212
795.25	77.	17.89	1.55	1.285E-02				
795.25	77.	17.89	1.55	1.285E-02	795.76	85.400	4.042E-02	CS134
911.55	399.	6.96	1.73	1.160E-02	911.07	29.000	6.763E-01	AC228
968.70	295.	8.89	1.59	1.109E-02	968.90	17.460	8.723E-01	AC228
1109.80	32.	37.20	1.89	1.002E-02	1112.07	13.580	PBC<MDA	EU152
1121.05	124.	18.14	2.05	9.965E-03	1120.28	15.040	4.739E-01	BI214
1461.42	1624.	2.56	2.06	8.188E-03	1460.75	10.700	1.064E+01	K40

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
1621.39	32.	28.66	1.43	7.569E-03	1620.56	2.750	8.886E-01	BI212
1765.12	95.	10.26	1.12	7.082E-03	1764.51	15.920	4.809E-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	
149.28	74.82	806.	459.	0.230	29.72	1.178	BI-207	D
153.93	77.14	841.	720.	0.360	20.42	1.179	PB-214	D
168.75	84.51	708.	114.	0.057	102.69	1.185	TA-182	lD
178.72	89.50	733.	156.	0.078	77.25	1.189	PB-214	lD
418.23	209.30	413.	97.	0.048	91.93	1.142	AC-228	
477.25	238.86	309.	1492.	0.746	9.24	1.297	PB-212	D
540.90	270.63	357.	116.	0.058	80.66	1.862	AC-228	s
601.05	300.71	188.	71.	0.035	87.57	1.140	PB-212	
656.77	328.57	389.	120.	0.060	92.70	1.798	RH-106M	s
819.27	409.83	115.	53.	0.026	93.65	1.332	AC-228	
1571.72	786.08	97.	44.	0.022	122.66	1.254	PB-214	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	149.29	74.81	2027.	370.	0.185	53.40	1.500D
PB-212	153.89	77.11	1784.	584.	0.292	33.09	1.500D
PB-214	153.89	77.11	1789.	580.	0.290	33.09	1.500D
EU-155	174.15	87.24	1806.	149.	0.075	123.08	1.500
TH-234	185.46	92.90	1647.	223.	0.112	76.81	1.500s
TH-234	185.43	92.88	1616.	212.	0.106	75.64	1.500s
RA-226	371.78	186.07	672.	212.	0.106	59.36	1.004
PB-212	477.24	238.80	819.	1233.	0.617	12.84	1.500
RA-224	481.63	241.00	1517.	188.	0.094	89.39	1.299D
PB-214	590.34	295.36	374.	319.	0.159	30.24	1.500
AC-228	677.11	338.75	339.	355.	0.177	31.35	1.174s
PB-214	703.95	352.17	282.	518.	0.259	18.82	1.500
SB-125	925.98	463.19	148.	82.	0.041	68.40	1.500s
TL-208	1022.41	511.41	263.	235.	0.117	38.84	1.356s
TL-208	1166.60	583.51	160.	569.	0.285	17.46	1.405
BI-214	1218.99	609.70	105.	456.	0.228	17.52	1.459

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
BI-212	1455.14	727.79	149.	119.	0.059	64.01	1.310
CS-134	1590.34	795.39	45.	79.	0.039	48.95	1.684
AC-228	1822.67	911.55	100.	395.	0.198	20.88	1.725
AC-228	1936.96	968.70	106.	293.	0.147	26.66	1.590
EU-152	2219.16	1109.80	56.	32.	0.016	111.61	1.892s
BI-214	2241.66	1121.05	114.	123.	0.062	54.43	2.054s
K-40	2922.44	1461.42	29.	1619.	0.809	7.69	2.059
BI-212	3242.40	1621.39	12.	32.	0.016	85.99	1.432s
BI-214	3529.89	1765.12	1.	94.	0.047	30.78	1.125s

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	&(	1.827E-01	5.30E-02	G
K-40		1.0644E+01						
			1460.75	1.064E+01	(P	1.835E-01	2.74E-01	G
MN-54		1.3462E-02						
			834.81	1.346E-02	%(P	2.282E-02	7.00E-03	G
CO-57		2.2462E-03						
			122.07	2.246E-03	&(P	2.923E-02	8.75E-03	G K
			136.43	1.698E-02	% P	2.367E-01	7.08E-02	G
CO-60		4.9590E-03						
			1332.51	4.959E-03	%(P	2.038E-02	5.79E-03	G K
			1173.23	-3.789E-04	& P	2.978E-02	8.45E-03	G K
Sr-85		-1.9519E-02						
			514.00	-1.952E-02	&(	2.827E-02	8.68E-03	G
Kr-85		-4.7116E+02						
			513.99	-4.712E+02	&(P	6.528E+02	2.00E+02	G
Y-88		-2.3677E-03						
			1836.01	-2.368E-03	%(P	1.995E-02	5.38E-03	G K
			898.02	-1.462E-03	% P	2.689E-02	7.70E-03	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
NB-94	-2.1530E-03						
		871.10	-2.153E-03	%(P	1.922E-02	5.52E-03	G K
		702.50	-7.324E-03	% P	2.414E-02	7.18E-03	G K
Ag-108M	-1.0964E-02						
		722.95	-1.096E-02	&(	3.079E-02	9.24E-03	G K
		614.37	-1.019E-02	%	2.631E-02	7.92E-03	G
		433.93	4.690E-03	% P	2.197E-02	6.51E-03	G
CD-109	-3.1807E-02						
		88.04	-3.181E-02	%(P	9.169E-01	2.75E-01	G
SN-113	-1.7511E-03						
		391.71	-1.751E-03	%(P	3.205E-02	9.39E-03	G K
		255.04	-1.814E-01	%	1.036E+00	3.09E-01	G
SB-125	6.4811E-02						
		427.95	4.867E-03	%(P	6.202E-02	1.81E-02	G K
		600.77	1.508E-02	% P	1.064E-01	3.11E-02	G
		636.15	-6.368E-04	% P	1.850E-01	5.33E-02	G
		463.51	2.422E-01	(P	1.751E-01	5.71E-02	G
		176.29	-1.909E-03	% P	3.629E-01	1.08E-01	G
I-131	6.5258E-03						
		364.48	6.526E-03	&(	2.192E-02	6.55E-03	G K
		636.97	-9.911E-02	%	3.298E-01	9.84E-02	G
		284.29	-3.551E-02	%	3.361E-01	9.98E-02	G
CS-134	1.9229E-02						
		604.66	-1.954E-04	&(P	4.576E-02	1.36E-02	G K
		795.76	4.143E-02	(P	1.779E-02	6.81E-03	G
		569.29	4.945E-02	&	1.239E-01	3.73E-02	G
		801.84	9.684E-02	% P	2.099E-01	6.35E-02	G
CS-137	-4.3776E-03						
		661.62	-4.378E-03	%(P	2.905E-02	8.42E-03	G
CE-139	3.1440E-03						
		165.85	3.144E-03	%(P	2.473E-02	7.39E-03	G
EU-152	3.6417E-02						
		121.78	-9.129E-03	%(P	8.180E-02	2.45E-02	G K
		344.30	-2.350E-02	% P	7.512E-02	2.25E-02	G
		1408.08	2.574E-02	% P	1.048E-01	3.04E-02	G
		964.00	-9.087E-03	& P	2.643E-01	7.75E-02	G
		1112.07	1.345E-01	*(P	1.597E-01	5.08E-02	G
		778.90	-3.196E-03	% P	1.510E-01	4.29E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
EU-154	9.6970E-05						
		123.10	9.697E-05	&(P	5.981E-02	1.78E-02	G K
		1274.80	7.044E-04	% P	7.371E-02	2.09E-02	G
		723.30	-8.320E-03	% P	2.237E-01	6.62E-02	G
		1004.80	1.826E-02	& P	1.188E-01	3.44E-02	G
EU-155	8.0143E-02						
		86.45	8.014E-02	(	1.076E-01	3.29E-02	G K
		105.31	-2.129E-02	% P	1.174E-01	3.52E-02	G
HG-203	1.2254E-02						
		279.17	1.225E-02	&(P	2.153E-02	6.56E-03	G K
		72.87	-2.466E-01	% P	7.939E-01	2.40E-01	G
		70.83	-1.326E-01	&	1.354E+00	4.07E-01	G
		82.50	-1.844E-01	&	1.517E+00	4.55E-01	G
TL-208	2.3425E-01						
		583.14	2.342E-01	(P	2.533E-02	1.38E-02	G
		510.72	3.328E-01	+ P	1.109E-01	4.93E-02	G
PB-212	5.1695E-01						
		238.63	5.169E-01	(P	5.704E-02	2.24E-02	G K
							Energy duplication
		77.11	6.506E-01	+	2.222E-01	7.18E-02	G
							Energy duplication
		74.81	7.785E-01	+ P	4.476E-01	1.40E-01	G
PB-214	3.3660E-01						
		351.99	3.318E-01	(P	5.186E-02	2.10E-02	G K
		295.22	3.459E-01	(P	1.007E-01	3.54E-02	G
							Energy duplication
		77.11	1.055E+00	+ P	3.639E-01	1.17E-01	G
		241.92	1.032E-01	% P	3.970E-01	1.19E-01	G
BI-212	4.2115E-01						
		727.17	4.211E-01	(P	2.121E-01	9.09E-02	G K
		1620.56	8.886E-01	+ P	5.201E-01	2.59E-01	G
		785.42	6.456E-01	% P	1.127E+00	3.44E-01	G
BI-214	3.6208E-01						
		609.32	3.621E-01	(P	4.010E-02	2.14E-02	G K
		1764.51	4.809E-01	+ P	3.766E-02	4.98E-02	G
		1120.28	4.739E-01	+ P	2.014E-01	8.66E-02	G
RA-224	8.7713E-01						
		241.00	8.771E-01	(P	8.585E-01	2.64E-01	G
RA-226	1.0312E+00						
		185.99	1.031E+00	(	6.011E-01	2.04E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
AC-228	6.7763E-01						
		911.07	6.763E-01	(P	8.439E-02	4.76E-02	G K
		968.90	8.723E-01	+ P	1.507E-01	7.81E-02	G
		338.40	6.808E-01	@(P	1.699E-01	7.19E-02	G
TH-227	-3.8499E-03						
		236.00	-3.850E-03	&(P	2.488E-01	7.42E-02	G K
		256.25	2.673E-02	& P	3.108E-01	9.23E-02	G
PA-234	2.1751E-02						
		98.44	2.175E-02	%(	1.112E-01	3.34E-02	G K
		946.00	-4.339E-02	%	1.419E-01	4.23E-02	G
		131.28	1.664E-02	&	1.177E-01	3.53E-02	G
		94.67	-1.029E-01	%	2.130E-01	6.46E-02	G
		883.24	-4.174E-02	&	2.049E-01	6.03E-02	G
		926.70	4.455E-02	&	2.017E-01	5.92E-02	G
		569.26	7.337E-02	&	1.837E-01	5.53E-02	G
TH-234	9.0177E-01						
		63.29	3.144E-01	%(P	1.396E+00	4.20E-01	G K
		92.80	1.186E+00	(P	1.062E+00	3.27E-01	G
		92.38	1.461E+00	(P	1.254E+00	3.87E-01	G
AM-241	-6.1861E-04						
		59.54	-6.186E-04	%(P	1.482E-01	4.41E-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	0.0000E+00	0.0000E+00	1.5909E-01	1.5910E-01	1.818E-01
K-40		1.0644E+01	1.0644E+01	8.2134E-01	1.0343E+00	
MN-54	#A	1.3451E-02	1.3462E-02	2.0996E-02	2.1011E-02	2.280E-02
CO-57	#B	2.2440E-03	2.2462E-03	2.6237E-02	2.6237E-02	2.920E-02
CO-60	#B	4.9584E-03	4.9590E-03	1.7359E-02	1.7361E-02	2.037E-02
Sr-85	#A	-1.9440E-02	-1.9519E-02	2.6054E-02	2.6080E-02	2.815E-02
Kr-85	#A	-4.7116E+02	-4.7116E+02	6.5854E+02	6.5913E+02	6.528E+02
Y-88	#B	-2.3619E-03	-2.3677E-03	2.9392E-02	2.9392E-02	1.990E-02
NB-94	#B	-2.1530E-03	-2.1530E-03	1.7604E-02	1.7605E-02	1.922E-02
Ag-108M	#B	-1.0964E-02	-1.0964E-02	2.7732E-02	2.7739E-02	3.079E-02
CD-109	#A	-3.1789E-02	-3.1807E-02	9.0368E-01	9.0368E-01	9.164E-01
SN-113	#B	-1.7471E-03	-1.7511E-03	6.8553E-02	6.8553E-02	3.198E-02
SB-125	#F	6.4795E-02	6.4811E-02	4.5850E-02	4.6009E-02	6.201E-02
I-131	#B	6.3151E-03	6.5258E-03	1.9662E-02	1.9665E-02	2.121E-02
CS-134	#B	1.9222E-02	1.9229E-02	9.4761E-03	9.5439E-03	4.574E-02
CS-137	#A	-4.3775E-03	-4.3776E-03	5.5218E-02	5.5219E-02	2.905E-02
CE-139	#A	3.1380E-03	3.1440E-03	2.2159E-02	2.2160E-02	2.468E-02
EU-152	#B	3.6415E-02	3.6417E-02	4.1301E-02	4.1351E-02	8.180E-02
EU-154	#B	9.6961E-05	9.6970E-05	5.3522E-02	5.3522E-02	5.980E-02
EU-155	#A	8.0131E-02	8.0143E-02	9.8638E-02	9.8738E-02	1.076E-01
HG-203	#B	1.2185E-02	1.2254E-02	1.9678E-02	1.9692E-02	2.141E-02
TL-208		2.3425E-01	2.3425E-01	4.1234E-02	4.3493E-02	
PB-212	#	5.1695E-01	5.1695E-01	6.7198E-02	7.3809E-02	5.704E-02
PB-214	#	3.3660E-01	3.3660E-01	6.0721E-02	6.3892E-02	5.186E-02
BI-212		4.2115E-01	4.2115E-01	2.7249E-01	2.7362E-01	
BI-214		3.6208E-01	3.6208E-01	6.4037E-02	6.7514E-02	
RA-224		8.7713E-01	8.7713E-01	7.9334E-01	7.9503E-01	
RA-226		1.0312E+00	1.0312E+00	6.1210E-01	6.1512E-01	
AC-228		6.7763E-01	6.7763E-01	1.2885E-01	1.3492E-01	
TH-227	#B	-3.8499E-03	-3.8499E-03	2.7978E-01	2.7978E-01	2.488E-01
PA-234	#B	2.1751E-02	2.1751E-02	1.0028E-01	1.0029E-01	1.112E-01
TH-234	#B	9.0177E-01	9.0177E-01	7.1740E-01	7.1914E-01	1.396E+00
AM-241	#A	-6.1861E-04	-6.1861E-04	1.2477E+01	1.2477E+01	1.482E-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) 1.4247151E+01 pCi/gm
Total Decayed Activity (270.2 to 2000.1 keV) 1.4247152E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
DAT

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

Sample description
OOL-10-04-005-F

Spectrum Filename: C:\GammaVision\Spectra\FSS-OOL-10-04-005-F.An1

Acquisition information

Start time:	31-Jul-2006 16:39:18
Live time:	2000
Real time:	2003
Dead time:	0.16 %
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:	2.0250E+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	27-Jul-2006 08:35:00
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. 22 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.3103

***** 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	316.	20.56	1.50	2.849E-02				
74.85	316.	20.56	1.50	2.849E-02	74.81	9.600	7.701E-01	PB212
77.04	488.	12.93	1.50	2.957E-02	77.11	10.700	1.029E+00	PB214
					77.11	17.500	6.292E-01	PB212
77.04	493.	12.93	1.50	2.957E-02	77.11	10.700	1.029E+00	PB214
					77.11	17.500	6.354E-01	PB212
87.37	223.	26.14	1.16	3.309E-02	86.45	32.740	1.386E-01	EU155
					88.04	3.790	1.187E+00	CD109
92.93	206.	25.47	1.97	3.441E-02	92.38	2.570	1.500E+00	TH234
					92.80	3.000	1.206E+00	TH234
128.87	128.	31.80	1.06	3.818E-02				
185.98	227.	21.27	1.36	3.610E-02	185.99	3.280	1.277E+00	RA226
209.78	160.	25.13	2.08	3.425E-02				
238.85	1472.	3.19	1.30	3.188E-02	238.63	43.100	7.071E-01	PB212
241.55	214.	21.51	1.30	3.166E-02	241.00	3.900	1.143E+00	RA224
					241.92	7.470	6.001E-01	PB214
270.15	126.	18.42	1.32	2.945E-02				
277.02	89.	40.03	0.82	2.895E-02				
287.24	50.	40.73	1.33	2.822E-02				
295.46	310.	8.90	1.34	2.766E-02	295.22	19.200	3.839E-01	PB214
300.62	80.	28.07	1.34	2.732E-02				
328.32	120.	23.46	1.32	2.558E-02				
338.75	346.	10.37	1.53	2.498E-02	338.40	12.010	7.618E-01	AC228
352.15	590.	7.44	1.23	2.425E-02	351.99	37.100	4.341E-01	PB214
409.61	61.	34.34	1.25	2.154E-02				
463.46	141.	19.95	1.61	1.953E-02				
463.46	141.	19.95	1.61	1.953E-02	463.51	10.000	4.750E-01	SB125

511.05	229.	12.96	1.89	1.807E-02	510.72	22.500	3.211E-01	TL208
583.42	497.	6.23	1.53	1.628E-02	583.14	86.000	2.346E-01	TL208
609.70	455.	6.82	1.53	1.573E-02	609.32	46.090	4.145E-01	BI214
661.63	131.	15.50	1.30	1.477E-02	661.62	84.620	6.818E-02	CS137
727.69	157.	15.53	1.49	1.374E-02	727.17	11.800	6.408E-01	BI212
769.02	69.	30.55	0.97	1.317E-02				
795.28	81.	18.57	1.89	1.284E-02				
795.28	81.	18.57	1.89	1.284E-02	795.76	85.400	4.936E-02	CS134
835.76	39.	37.86	1.71	1.239E-02	834.81	99.978	PBC<MDA	MN54
860.26	102.	22.62	1.83	1.211E-02				
911.56	356.	6.39	2.08	1.160E-02	911.07	29.000	6.963E-01	AC228
964.55	58.	22.53	1.80	1.113E-02				
969.48	196.	9.46	1.80	1.109E-02	968.90	17.460	6.693E-01	AC228

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
1121.01	130.	18.32	1.67	9.965E-03	1120.28	15.040	5.746E-01	BI214
1461.42	1816.	2.42	2.15	8.188E-03	1460.75	10.700	1.379E+01	K40
1621.85	18.	32.25	0.65	7.569E-03	1620.56	2.750	5.706E-01	BI212
1765.22	70.	13.22	1.83	7.081E-03	1764.51	15.920	4.066E-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	
257.39	128.87	707.	154.	0.077	77.38	1.064	AC-228	
419.21	209.78	586.	160.	0.080	75.39	2.077	NP-239	s
477.34	238.87	369.	1472.	0.736	9.58	1.297	PB-212	D
482.74	241.57	952.	214.	0.107	64.54	1.299	PB-214	D
539.92	270.17	207.	126.	0.063	55.25	1.320	AC-228	D
553.66	277.02	418.	106.	0.053	87.03	0.816	TL-208	s
600.87	300.60	215.	80.	0.040	84.21	1.341	PB-212	lD
656.26	328.32	272.	120.	0.060	70.38	1.323	RH-106M	
818.82	409.61	160.	61.	0.031	103.01	1.248	AC-228	
1537.61	769.02	122.	69.	0.035	76.52	0.965	BI-214	sM
1720.09	860.26	116.	102.	0.051	67.87	1.832	TL-208	s
1929.77	964.60	54.	62.	0.031	63.14	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	149.36	74.85	2001.	316.	0.158	61.67	1.500s
PB-214	153.89	77.11	1789.	488.	0.244	38.80	1.500D
PB-212	153.89	77.11	1785.	493.	0.246	38.80	1.500D
EU-155	174.08	87.21	1619.	222.	0.111	79.39	1.500
CD-109	174.40	87.37	1323.	223.	0.111	78.42	1.164
TH-234	185.71	93.02	1577.	215.	0.107	78.10	1.500s
TH-234	185.67	93.00	1528.	209.	0.105	74.60	1.500s
RA-226	371.60	185.98	806.	227.	0.113	63.81	1.362
PB-212	477.29	238.83	860.	1392.	0.696	11.86	1.500s
PB-214	590.52	295.45	419.	324.	0.162	31.08	1.500s
AC-228	677.11	338.75	317.	343.	0.171	31.12	1.532s
PB-214	703.92	352.15	293.	520.	0.260	18.94	1.500

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
SB-125	926.37	463.39	188.	94.	0.047	66.95	1.500s
TL-208	1021.70	511.05	238.	196.	0.098	38.89	1.894s
TL-208	1166.43	583.42	159.	492.	0.246	18.69	1.526
BI-214	1218.98	609.70	149.	451.	0.225	20.46	1.530
CS-137	1322.84	661.63	104.	128.	0.064	46.49	1.299s
BI-212	1454.94	727.69	126.	156.	0.078	46.59	1.494s
CS-134	1590.76	795.60	81.	78.	0.039	59.53	1.684
MN-54	1671.09	835.76	93.	39.	0.020	113.58	1.711
AC-228	1822.68	911.56	69.	351.	0.176	19.18	2.082
AC-228	1937.36	968.90	94.	194.	0.097	29.72	1.799D
BI-214	2241.59	1121.01	126.	129.	0.065	54.97	1.674
K-40	2922.43	1461.42	31.	1811.	0.905	7.26	2.151
BI-212	3243.32	1621.85	6.	18.	0.009	96.75	0.645s
BI-214	3530.09	1765.22	6.	69.	0.034	39.67	1.828s

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		-1.2308E-02					
			477.56	-1.231E-02	%(	2.338E-01	6.83E-02 G
K-40		1.3788E+01					
			1460.75	1.379E+01	(P	2.186E-01	3.35E-01 G
MN-54		2.1281E-02					
			834.81	2.128E-02	(P	2.589E-02	8.15E-03 G
CO-57		1.1848E-02					
			122.07	1.185E-02	%(P	3.219E-02	9.72E-03 G K
			136.43	4.864E-02	% P	2.626E-01	7.88E-02 G
CO-60		-1.7685E-03					
			1332.51	-1.769E-03	&(P	3.770E-02	1.07E-02 G K
			1173.23	1.399E-02	% P	3.524E-02	1.05E-02 G K
Sr-85		-1.6337E-02					
			514.00	-1.634E-02	%(	3.366E-02	1.02E-02 G
Kr-85		-3.8622E+02					
			513.99	-3.862E+02	%(P	7.454E+02	2.25E+02 G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
Y-88	1.3238E-03						
		1836.01	1.324E-03	%(P	1.763E-02	4.58E-03	G K
		898.02	-7.428E-03	% P	3.174E-02	9.27E-03	G
NB-94	-1.7400E-03						
		871.10	-1.740E-03	%(P	2.420E-02	6.95E-03	G K
		702.50	-5.461E-03	% P	3.067E-02	9.04E-03	G K
Ag-108M	0.0000E+00						
		722.95	0.000E+00	&(	5.578E-02	1.65E-02	G K
		614.37	-5.948E-03	%	3.192E-02	9.45E-03	G
		433.93	1.752E-03	% P	2.307E-02	6.73E-03	G
CD-109	1.1865E+00						
		88.04	1.187E+00	(P	9.177E-01	3.12E-01	G
SN-113	-1.2603E-02						
		391.71	-1.260E-02	%(P	3.879E-02	1.16E-02	G K
		255.04	3.089E-01	%	1.217E+00	3.65E-01	G
SB-125	8.8991E-02						
		427.95	1.009E-02	%(P	7.699E-02	2.27E-02	G K
		600.77	-3.128E-03	& P	1.392E-01	4.02E-02	G
		636.15	-2.444E-02	% P	2.201E-01	6.41E-02	G
		463.51	3.225E-01	*(P	2.284E-01	7.41E-02	G
		176.29	5.140E-03	& P	3.775E-01	1.12E-01	G
I-131	-1.2522E-02						
		364.48	-1.252E-02	%(	4.205E-02	1.26E-02	G K
		636.97	9.136E-02	%	3.689E-01	1.08E-01	G
		284.29	-1.446E-01	%	5.629E-01	1.69E-01	G
CS-134	2.1223E-02						
		604.66	-1.662E-03	%(P	5.251E-02	1.56E-02	G K
		795.76	4.738E-02	(P	2.736E-02	9.47E-03	G
		569.29	-3.255E-02	&	1.662E-01	4.91E-02	G
		801.84	-2.397E-03	& P	2.708E-01	7.71E-02	G
CS-137	6.8180E-02						
		661.62	6.818E-02	*(P	2.687E-02	1.09E-02	G
CE-139	-7.9327E-04						
		165.85	-7.933E-04	%(P	3.291E-02	9.81E-03	G
EU-152	3.5417E-02						
		121.78	3.542E-02	%(P	9.843E-02	2.97E-02	G K
		344.30	-2.572E-02	% P	9.178E-02	2.75E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
		1408.08	4.791E-03	% P	1.190E-01	3.31E-02	G
		964.00	-4.776E-03	& P	2.090E-01	6.01E-02	G
		1112.07	7.889E-02	% P	2.261E-01	6.74E-02	G
		778.90	-3.243E-02	% P	2.091E-01	6.11E-02	G
EU-154	-7.3343E-03						
		123.10	-7.334E-03	&(P	7.346E-02	2.20E-02	G K
		1274.80	-6.952E-04	% P	1.037E-01	2.97E-02	G
		723.30	-8.911E-02	% P	1.754E-01	5.32E-02	G
		1004.80	1.781E-02	% P	1.708E-01	4.96E-02	G
EU-155	1.3820E-01						
		86.45	1.382E-01	(	1.183E-01	3.66E-02	G K
		105.31	3.889E-02	& P	1.426E-01	4.30E-02	G
HG-203	-5.5528E-03						
		279.17	-5.553E-03	&(P	3.206E-02	9.55E-03	G K
		72.87	-5.604E-01	% P	9.581E-01	2.91E-01	G
		70.83	-1.120E+00	%	1.535E+00	4.69E-01	G
		82.50	-4.587E-01	&	1.938E+00	5.84E-01	G
TL-208	2.3458E-01						
		583.14	2.346E-01	(P	2.924E-02	1.48E-02	G
		510.72	3.211E-01	+ P	1.224E-01	4.88E-02	G
PB-212	6.6407E-01						
		238.63	6.757E-01	@(P	6.764E-02	2.70E-02	G K
							Energy duplication
		77.11	6.354E-01	*(	2.573E-01	8.22E-02	G
		74.81	7.701E-01	+ P	5.152E-01	1.60E-01	G
PB-214	3.9294E-01						
		351.99	3.858E-01	(P	6.112E-02	2.46E-02	G K
		295.22	4.067E-01	*(P	1.232E-01	4.27E-02	G
							Energy duplication
		77.11	1.029E+00	+ P	4.214E-01	1.34E-01	G
		241.92	8.119E-02	% P	4.758E-01	1.43E-01	G
BI-212	6.2752E-01						
		727.17	6.408E-01	*(P	2.267E-01	1.00E-01	G K
		1620.56	5.706E-01	(P	4.590E-01	1.89E-01	G
		785.42	3.573E-01	% P	1.374E+00	4.06E-01	G
BI-214	4.1247E-01						
		609.32	4.145E-01	(P	5.487E-02	2.85E-02	G K
		1764.51	4.066E-01	@(P	8.523E-02	5.45E-02	G
		1120.28	5.746E-01	+ P	2.448E-01	1.06E-01	G

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 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments

RA-224       5.6119E-01
                          241.00 5.612E-01 %(P 8.400E-01 2.56E-01 G

RA-226       1.2770E+00
                          185.99 1.277E+00  (  7.610E-01 2.72E-01 G

AC-228       7.0183E-01
                          911.07 6.963E-01  (P 8.196E-02 4.51E-02 G K
                          968.90 6.697E-01  (P 1.647E-01 6.71E-02 G
                          338.40 7.618E-01 @(P 1.905E-01 7.98E-02 G

TH-227      -2.1492E-01
                          236.00-2.149E-01 &(P 3.095E-01 9.45E-02 G K
                          256.25-1.055E-02 & P 3.776E-01 1.12E-01 G

PA-234       4.4871E-02
                           98.44 4.487E-02 %(  1.249E-01 3.77E-02 G K
                          946.00-5.729E-02 %   1.714E-01 5.13E-02 G
                          131.28-2.653E-02 %   1.490E-01 4.48E-02 G
                           94.67-8.405E-02 %   2.406E-01 7.27E-02 G
                          883.24 5.471E-02 %   1.966E-01 5.81E-02 G
                          926.70-2.950E-02 %   2.402E-01 6.97E-02 G
                          569.26-4.804E-02 &   2.456E-01 7.26E-02 G

TH-234       1.0922E+00
                           63.29 5.391E-01 %(P 1.494E+00 4.50E-01 G K
                           92.80 1.355E+00  (P 1.196E+00 3.69E-01 G
                           92.38 1.625E+00  (P 1.422E+00 4.39E-01 G

AM-241      -5.4185E-02
                           59.54-5.419E-02 %(P 1.887E-01 5.68E-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	-1.1634E-02	-1.2308E-02	2.0493E-01	2.0493E-01	2.210E-01
K-40		1.3788E+01	1.3788E+01	1.0033E+00	1.2922E+00	
MN-54	#A	2.1077E-02	2.1281E-02	2.4436E-02	2.4468E-02	2.564E-02
CO-57	#B	1.1716E-02	1.1848E-02	2.9175E-02	2.9182E-02	3.183E-02
CO-60	#B	-1.7658E-03	-1.7685E-03	1.3484E-01	1.3484E-01	3.764E-02
Sr-85	#A	-1.5597E-02	-1.6337E-02	3.0637E-02	3.0652E-02	3.214E-02
Kr-85	#A	-3.8621E+02	-3.8622E+02	7.7204E+02	7.7238E+02	7.453E+02
Y-88	#B	1.2870E-03	1.3238E-03	1.3734E-02	1.3735E-02	1.714E-02
NB-94	#B	-1.7400E-03	-1.7400E-03	2.2736E-02	2.2737E-02	2.420E-02
Ag-108M	#B	0.0000E+00	0.0000E+00	4.9465E-02	4.9465E-02	5.578E-02
CD-109		1.1787E+00	1.1865E+00	9.3183E-01	9.3415E-01	
SN-113	#B	-1.2278E-02	-1.2603E-02	3.9894E-02	3.9901E-02	3.779E-02
SB-125	#F	8.8727E-02	8.8991E-02	6.1361E-02	6.1586E-02	7.676E-02
I-131	#B	-8.6162E-03	-1.2522E-02	3.7799E-02	3.7806E-02	2.893E-02
CS-134	#B	2.1138E-02	2.1223E-02	1.2721E-02	1.2782E-02	5.230E-02
CS-137	#	6.8161E-02	6.8180E-02	3.2576E-02	3.2824E-02	
CE-139	#A	-7.7612E-04	-7.9327E-04	3.5816E-02	3.5816E-02	3.220E-02
EU-152	#B	3.5394E-02	3.5417E-02	8.9208E-02	8.9230E-02	9.837E-02
EU-154	#B	-7.3272E-03	-7.3343E-03	7.0374E-02	7.0375E-02	7.339E-02
EU-155	#	1.3797E-01	1.3820E-01	1.0972E-01	1.0999E-01	1.181E-01
HG-203	#B	-5.2059E-03	-5.5528E-03	3.3015E-02	3.3017E-02	3.006E-02
TL-208		2.3458E-01	2.3458E-01	4.4254E-02	4.6372E-02	
PB-212	#	6.6407E-01	6.6407E-01	7.9628E-02	8.8763E-02	6.764E-02
PB-214	#	3.9294E-01	3.9294E-01	7.2434E-02	7.6060E-02	6.112E-02
BI-212		6.2752E-01	6.2752E-01	2.9478E-01	2.9710E-01	
BI-214		4.1247E-01	4.1247E-01	8.5184E-02	8.8599E-02	
RA-224	#A	5.6119E-01	5.6119E-01	7.6898E-01	7.6970E-01	8.400E-01
RA-226		1.2770E+00	1.2770E+00	8.1492E-01	8.1840E-01	
AC-228		7.0183E-01	7.0183E-01	1.1140E-01	1.1886E-01	
TH-227	#B	-2.1492E-01	-2.1492E-01	2.8493E-01	2.8521E-01	3.095E-01

PA-234 #B	4.4871E-02	4.4871E-02	1.1323E-01	1.1326E-01	1.249E-01

TH-234 #B	1.0922E+00	1.0922E+00	8.8476E-01	8.8683E-01	1.494E+00
AM-241 #A	-5.4184E-02	-5.4185E-02	1.7518E-01	1.7521E-01	1.887E-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 (1120.2 to 2000.1 keV) 1.8288616E+01 pCi/gm
Total Decayed Activity (1120.2 to 2000.1 keV) 1.8296484E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
JPK

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab