

Sample description
FSS-OOL-13-01-004-F

Spectrum Filename: C:\GammaVision\Spectra\101F_19JUL2006_1914.An1

Acquisition information

Start time: 19-Jul-2006 19:14:09
Live time: 2000
Real time: 2002
Dead time: 0.09 %
Detector ID: 1

Detector system

Det 101- DSPE-633

Calibration

Filename: D1_1LSa.Clb
Detector 101 1.0 Liter Marinelli Sand

Energy Calibration

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

Efficiency Calibration

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

Library Files

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

Analysis parameters

Analysis engine: Env32 G53W4.20
Start channel: 100 (50.23keV)
Stop channel: 4000 (1999.11keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 1.9690E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.9690E+03) =
 5.0787E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	17-Jul-2006 11:00:00
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. 19 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.2660

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

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
74.85	194.	24.62	1.50	1.654E-02				
74.85	194.	24.62	1.50	1.654E-02	74.81	9.600	8.391E-01	PB212
77.16	312.	15.09	1.50	1.720E-02	77.11	10.700	1.162E+00	PB214
					77.11	17.500	7.104E-01	PB212
77.16	315.	15.09	1.50	1.720E-02	77.11	10.700	1.162E+00	PB214
					77.11	17.500	7.189E-01	PB212
87.50	107.	27.95	1.01	1.926E-02				
87.50	107.	27.95	1.01	1.926E-02	88.04	3.790	PBC<MDA	CD109
89.49	79.	37.08	1.02	1.952E-02				
93.19	184.	15.81	1.02	1.994E-02	92.80	3.000	2.049E+00	TH234
186.31	149.	23.65	1.29	1.856E-02	185.99	3.280	1.675E+00	RA226
209.58	74.	41.17	0.82	1.720E-02				
238.92	772.	4.20	1.12	1.556E-02	238.63	43.100	7.832E-01	PB212
242.10	102.	21.12	1.12	1.539E-02	241.00	3.900	PBC<MDA	RA224
					241.92	7.470	PBC<MDA	PB214
270.19	59.	35.19	1.97	1.401E-02				
295.36	183.	13.58	1.28	1.291E-02	295.22	19.200	5.014E-01	PB214
300.65	53.	35.22	1.10	1.270E-02				
328.62	42.	36.42	1.09	1.167E-02				
338.75	171.	15.62	1.50	1.134E-02	338.40	12.010	8.485E-01	AC228
352.20	290.	10.50	1.32	1.092E-02	351.99	37.100	4.874E-01	PB214
511.11	120.	17.40	1.90	7.585E-03	510.72	22.500	4.194E-01	TL208
583.48	279.	8.08	1.29	6.681E-03	583.14	86.000	3.300E-01	TL208
609.79	190.	11.28	1.64	6.408E-03	609.32	46.090	4.398E-01	BI214
662.08	46.	36.60	1.06	5.934E-03				
727.59	60.	24.70	1.13	5.440E-03	727.17	11.800	6.392E-01	BI212
911.84	164.	11.87	1.21	4.443E-03	911.07	29.000	8.624E-01	AC228

968.91	91.	19.99	1.42	4.212E-03	968.90	17.460	8.425E-01	AC228
1120.20	48.	27.00	1.58	3.711E-03	1120.28	15.040	5.856E-01	BI214
1461.67	697.	3.86	2.14	2.941E-03	1460.75	10.700	1.515E+01	K40
1765.64	24.	20.41	1.01	2.481E-03	1764.51	15.920	4.094E-01	BI214

***** U N I D E N T I F I E D P E A K S U M M A R Y *****									
Channel	Peak Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide		
174.58	87.58	396.	107.	0.054	83.86	1.014	PB-214	1D	
178.55	89.57	385.	79.	0.039	111.23	1.015	PB-214	1D	
418.83	209.58	346.	74.	0.037	123.51	0.823	NP-239	s	
477.53	238.87	140.	772.	0.386	12.60	1.122	PB-212	D	
483.89	242.05	181.	102.	0.051	63.35	1.124	PB-214	D	
540.10	270.19	172.	59.	0.030	105.57	1.974	AC-228	s	
601.06	300.65	133.	53.	0.026	105.66	1.105	PB-212		
657.02	328.62	96.	42.	0.021	109.26	1.091	RH-106M		
1324.24	662.08	77.	47.	0.024	89.74	1.059	CS-137		

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

This section based on library: FSS_Rev_1.Lib

***** I D E N T I F I E D P E A K S U M M A R Y *****								
Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	
PB-212	149.26	74.85	1110.	194.	0.097	73.86	1.499	
PB-214	153.79	77.11	978.	312.	0.156	45.27	1.499D	
PB-212	153.79	77.11	975.	315.	0.158	45.27	1.499D	
TH-234	185.96	93.19	878.	188.	0.094	67.86	1.499s	
RA-226	372.10	186.22	478.	141.	0.071	70.32	1.499s	
PB-212	477.54	238.92	413.	583.	0.291	19.08	1.499	
RA-224	483.45	241.87	474.	87.	0.043	110.15	1.499s	
PB-214	590.93	295.59	195.	167.	0.083	41.95	1.499s	
AC-228	677.29	338.75	176.	169.	0.084	46.86	1.502s	
PB-214	704.48	352.34	155.	258.	0.129	27.45	1.499s	
TL-208	1022.16	511.11	110.	104.	0.052	52.19	1.900s	
TL-208	1166.96	583.48	70.	276.	0.138	24.24	1.294	
BI-214	1219.62	609.79	79.	189.	0.095	33.84	1.637s	
BI-212	1455.33	727.59	53.	60.	0.030	74.09	1.127	
AC-228	1824.02	911.84	57.	162.	0.081	35.62	1.209s	
AC-228	1938.23	968.91	61.	90.	0.045	59.98	1.424	
BI-214	2240.99	1120.20	40.	48.	0.024	81.01	1.581	
K-40	2924.35	1461.67	9.	695.	0.348	11.59	2.143	
BI-214	3532.71	1765.64	0.	24.	0.012	61.24	1.008s	

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

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****							
- Nuclide -		Average	----- Peak -----				
Name	Code	Activity pCi/gm	Energy keV	Activity pCi/gm	Code	MDA Value pCi/gm	COMMENTS
BE-7		3.9801E-02	477.56	3.980E-02	% (	3.912E-01 1.13E-01	G
K-40		1.5153E+01	1460.75	1.515E+01	(P	3.618E-01 5.88E-01	G
MN-54		-1.0425E-02	834.81	-1.043E-02	& (P	5.178E-02 1.50E-02	G
CO-57		-6.4681E-03	122.07	-6.468E-03	% (	4.324E-02 1.29E-02	G K
			136.43	-1.081E-02	%	3.887E-01 1.16E-01	G
CO-60		-3.0095E-03	1332.51	-3.010E-03	& (P	7.615E-02 2.15E-02	G K
			1173.23	2.448E-02	% P	6.706E-02 2.00E-02	G K
Sr-85		-2.0605E-02	514.00	-2.061E-02	% (	5.878E-02 1.76E-02	G
Kr-85		-4.8880E+02	513.99	-4.888E+02	% (P	1.328E+03 3.97E+02	G
Y-88		2.2709E-03	1836.01	2.271E-03	& (	4.429E-02 1.13E-02	G K
			898.02	2.164E-03	& P	4.481E-02 1.24E-02	G
NB-94		-1.9116E-03	871.10	-1.912E-03	& (P	5.245E-02 1.48E-02	G K
			702.50	9.281E-03	& P	4.257E-02 1.24E-02	G K
Ag-108M		-1.6950E-02	722.95	-1.695E-02	& (	6.020E-02 1.78E-02	G K
			614.37	-1.240E-02	% P	5.010E-02 1.47E-02	G
			433.93	5.347E-03	%	3.920E-02 1.14E-02	G
CD-109		-1.7460E-01	88.04	-1.746E-01	% (P	1.512E+00 4.53E-01	G
SN-113		2.1190E-03	391.71	2.119E-03	% (	5.467E-02 1.58E-02	G K
			255.04	4.057E-01	% P	1.796E+00 5.35E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	-6.4035E-03	427.95	6.403E-03	%(P	1.113E-01	3.18E-02	G K
		600.77	2.203E-02	% P	2.207E-01	6.32E-02	G
		636.15	6.505E-02	& P	3.950E-01	1.14E-01	G
		463.51	2.696E-01	% P	3.942E-01	1.22E-01	G
		176.29	1.556E-01	% P	5.991E-01	1.79E-01	G
I-131	-1.6426E-02	364.48	1.643E-02	%(	6.023E-02	1.79E-02	G K
		636.97	2.769E-01	%	6.480E-01	1.95E-01	G
		284.29	1.970E-01	&	7.782E-01	2.32E-01	G
CS-134	-1.8359E-03	604.66	1.836E-03	%(P	7.453E-02	2.17E-02	G K
		795.76	2.947E-02	% P	5.742E-02	1.75E-02	G
		569.29	1.597E-02	% P	2.851E-01	8.17E-02	G
		801.84	4.869E-02	%	5.237E-01	1.49E-01	G
CS-137	-2.8082E-03	661.62	2.808E-03	%(P	5.241E-02	1.47E-02	G
CE-139	-1.2639E-02	165.85	1.264E-02	%(P	5.120E-02	1.54E-02	G
EU-152	-2.6160E-02	121.78	2.616E-02	%(P	1.441E-01	4.31E-02	G K
		344.30	8.009E-03	% P	1.212E-01	3.50E-02	G
		1408.08	2.239E-03	% P	2.305E-01	6.09E-02	G
		964.00	7.250E-02	& P	4.081E-01	1.17E-01	G
		1112.07	8.573E-02	& P	3.728E-01	1.07E-01	G
		778.90	3.429E-02	% P	2.487E-01	6.95E-02	G
EU-154	1.0304E-02	123.10	1.030E-02	%(P	9.575E-02	2.85E-02	G K
		1274.80	1.915E-02	% P	1.537E-01	4.32E-02	G
		723.30	8.866E-02	% P	2.908E-01	8.61E-02	G
		1004.80	6.424E-02	& P	2.180E-01	6.33E-02	G
EU-155	-2.3392E-03	86.45	2.339E-03	%(	1.729E-01	5.16E-02	G K
		105.31	4.742E-02	%	2.007E-01	6.03E-02	G
HG-203	-3.5896E-03	279.17	3.590E-03	%(	4.883E-02	1.44E-02	G K
		72.87	2.140E-01	% P	1.097E+00	3.29E-01	G
		70.83	9.384E-01	&	2.104E+00	6.37E-01	G
		82.50	2.576E-01	&	2.109E+00	6.30E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	3.3001E-01	583.14	3.300E-01	(P	4.964E-02	2.69E-02	G
		510.72	4.194E-01	+ P	2.070E-01	8.42E-02	G
PB-212	5.9577E-01	238.63	5.958E-01	(P	9.960E-02	3.83E-02	G K
		77.11	7.189E-01	+	3.378E-01	1.08E-01	G
		74.81	8.391E-01	& P	6.828E-01	2.12E-01	G
PB-214	4.4527E-01	351.99	4.370E-01	@(P	1.028E-01	4.03E-02	G K
		295.22	4.613E-01	*(P	1.876E-01	6.52E-02	G
		77.11	1.162E+00	+ P	5.535E-01	1.77E-01	G
		241.92	2.684E-02	% P	7.511E-01	2.23E-01	G
BI-212	6.3925E-01	727.17	6.392E-01	(P	3.921E-01	1.60E-01	G K
		1620.56	1.866E-01	%	1.724E+00	4.66E-01	G
		785.42	1.429E-01	% P	2.329E+00	6.56E-01	G
BI-214	4.3197E-01	609.32	4.398E-01	@(P	1.022E-01	4.99E-02	G K
		1764.51	4.094E-01	(P	1.280E-01	8.52E-02	G
		1120.28	5.856E-01	+ P	3.975E-01	1.59E-01	G
RA-224	9.8982E-01	241.00	9.898E-01	&(P	1.187E+00	3.66E-01	G
RA-226	1.5907E+00	185.99	1.591E+00	@(	1.177E+00	3.73E-01	G
AC-228	8.5360E-01	911.07	8.624E-01	*(P	2.016E-01	1.04E-01	G K
		968.90	8.425E-01	(P	3.641E-01	1.70E-01	G
		338.40	8.485E-01	*(P	3.253E-01	1.34E-01	G
TH-227	-6.2494E-02	236.00	6.249E-02	%(P	4.085E-01	1.22E-01	G K
		256.25	1.260E-01	% P	5.094E-01	1.52E-01	G
PA-234	1.9929E-03	98.44	1.993E-03	%(	1.792E-01	5.33E-02	G K
		946.00	3.796E-02	%	2.587E-01	7.40E-02	G
		131.28	2.462E-03	&	2.148E-01	6.39E-02	G
		94.67	1.073E-01	%	3.197E-01	9.65E-02	G
		883.24	1.322E-04	&	3.769E-01	1.04E-01	G
		926.70	7.137E-02	%	4.332E-01	1.24E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
		569.26	3.035E-02	%	4.205E-01	1.21E-01	G
TH-234	1.2847E+00						
		63.29	6.063E-01	%(P	2.152E+00	6.46E-01	G K
		92.80	2.167E+00	(P	1.619E+00	5.06E-01	G
		92.38	5.523E-01	% P	1.554E+00	4.62E-01	G

AM-241 -1.9647E-03
59.54-1.965E-03 %(P 3.033E-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:

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 *****						
Time of Count		Time Corrected		Uncertainty		3 Sigma
Nuclide	Activity	Activity	Counting	Total	MDA	
	pCi/gm	pCi/gm	pCi/gm	pCi/gm	pCi/gm	
BE-7 #A	3.8609E-02	3.9801E-02	3.3974E-01	3.3974E-01	3.795E-01	
K-40	1.5153E+01	1.5153E+01	1.7618E+00	1.9588E+00		
MN-54 #A	-1.0371E-02	-1.0425E-02	5.0335E-02	5.0338E-02	5.151E-02	
CO-57 #B	-6.4293E-03	-6.4681E-03	3.8710E-02	3.8711E-02	4.298E-02	
CO-60 #B	-3.0070E-03	-3.0095E-03	7.2897E-02	7.2897E-02	7.608E-02	

Sr-85	#A	-2.0095E-02	-2.0605E-02	5.2873E-02	5.2886E-02	5.733E-02
Kr-85	#A	-4.8880E+02	-4.8880E+02	1.3182E+03	1.3185E+03	1.328E+03
Y-88	#B	2.2365E-03	2.2709E-03	3.3985E-02	3.3985E-02	4.362E-02
NB-94	#B	-1.9116E-03	-1.9116E-03	5.4512E-02	5.4512E-02	5.245E-02
Ag-108M	#B	-1.6949E-02	-1.6950E-02	5.3407E-02	5.3415E-02	6.020E-02
CD-109	#A	-1.7397E-01	-1.7460E-01	1.4291E+00	1.4291E+00	1.507E+00
SN-113	#B	2.0893E-03	2.1190E-03	4.7277E-02	4.7277E-02	5.390E-02
SB-125	#B	-6.3932E-03	-6.4035E-03	1.2426E-01	1.2426E-01	1.111E-01
I-131	#B	-1.3421E-02	-1.6426E-02	5.3784E-02	5.3792E-02	4.921E-02
CS-134	#B	-1.8320E-03	-1.8359E-03	1.4083E-01	1.4083E-01	7.437E-02
CS-137	#A	-2.8077E-03	-2.8082E-03	1.1100E-01	1.1100E-01	5.240E-02
CE-139	#A	-1.2490E-02	-1.2639E-02	4.7114E-02	4.7120E-02	5.059E-02
EU-152	#B	-2.6150E-02	-2.6160E-02	1.3823E-01	1.3824E-01	1.440E-01
EU-154	#B	1.0299E-02	1.0304E-02	8.5603E-02	8.5605E-02	9.570E-02
EU-155	#B	-2.3371E-03	-2.3392E-03	1.5482E-01	1.5482E-01	1.728E-01
HG-203	#B	-3.4667E-03	-3.5896E-03	4.3115E-02	4.3116E-02	4.716E-02
TL-208		3.3001E-01	3.3001E-01	8.0668E-02	8.2795E-02	
PB-212	#	5.9577E-01	5.9577E-01	1.1487E-01	1.1971E-01	9.960E-02
PB-214	#	4.4527E-01	4.4527E-01	1.1271E-01	1.1548E-01	1.028E-01
BI-212		6.3925E-01	6.3925E-01	4.7899E-01	4.8035E-01	
BI-214		4.3197E-01	4.3197E-01	1.4703E-01	1.4905E-01	
RA-224	#A	9.8982E-01	9.8982E-01	1.0992E+00	1.1006E+00	1.187E+00
RA-226	#	1.5907E+00	1.5907E+00	1.1186E+00	1.1222E+00	1.177E+00
AC-228		8.5360E-01	8.5360E-01	2.4155E-01	2.4632E-01	
TH-227	#B	-6.2494E-02	-6.2494E-02	3.8549E-01	3.8550E-01	4.085E-01
PA-234	#B	1.9929E-03	1.9929E-03	1.5989E-01	1.5989E-01	1.792E-01
TH-234	#B	1.2847E+00	1.2847E+00	9.0042E-01	9.0323E-01	2.152E+00
AM-241	#A	-1.9647E-03	-1.9647E-03	4.8040E-01	4.8040E-01	3.033E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
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) 1.7407461E+01 pCi/gm
Total Decayed Activity (270.1 to 1999.1 keV) 1.7407461E+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-13-01-011-F

Spectrum Filename: C:\GammaVision\Spectra\101F_19JUL2006_1950.An1

Acquisition information

Start time: 19-Jul-2006 19:50:46
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: 1.8780E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.8780E+03) =
 5.3248E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	17-Jul-2006 11:10:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	101_150K_28APR05.Pbc 01-May-2005 05:24:47
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 15 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.4296

***** S U M M A R Y O F P E A K S I N R A N G E *****								
Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
74.38	151.	21.48	1.00	1.651E-02				
74.38	151.	21.48	1.00	1.651E-02	74.81	9.600	PBC<MDA	PB212
77.38	303.	10.79	1.01	1.736E-02	77.11	10.700	1.171E+00	PB214
					77.11	17.500	7.252E-01	PB212
87.83	86.	34.24	1.01	1.931E-02	86.45	32.740	9.901E-02	EU155
					88.04	3.790	PBC<MDA	CD109
90.11	78.	36.80	1.02	1.960E-02				
90.11	78.	36.80	1.02	1.960E-02	92.38	2.570	PBC<MDA	TH234
92.92	118.	22.98	1.02	1.992E-02	92.80	3.000	PBC<MDA	TH234
186.26	60.	39.72	1.26	1.857E-02	185.99	3.280	7.083E-01	RA226
209.54	77.	28.48	0.89	1.720E-02				
238.92	684.	4.47	1.12	1.556E-02	238.63	43.100	7.268E-01	PB212
241.84	88.	34.63	1.50	1.545E-02				
241.84	88.	34.63	1.50	1.545E-02	241.00	3.900	PBC<MDA	RA224
270.84	80.	30.62	1.46	1.398E-02				
278.06	41.	41.64	0.72	1.365E-02				
278.06	41.	41.64	0.72	1.365E-02	279.17	81.500	2.764E-02	HG203
295.62	166.	10.74	1.16	1.290E-02	295.22	19.200	4.777E-01	PB214
327.74	65.	29.09	1.09	1.170E-02				
338.70	138.	15.44	1.44	1.134E-02	338.40	12.010	7.196E-01	AC228
352.29	271.	9.85	1.27	1.092E-02	351.99	37.100	4.769E-01	PB214
462.98	44.	39.55	0.96	8.351E-03				
462.98	44.	39.55	0.96	8.351E-03	463.51	10.000	PBC<MDA	SB125
510.63	88.	19.81	1.51	7.592E-03	510.72	22.500	3.032E-01	TL208
583.72	220.	10.12	1.27	6.678E-03	583.14	86.000	2.729E-01	TL208
609.67	173.	9.96	1.10	6.409E-03	609.32	46.090	4.187E-01	BI214
727.83	65.	20.00	1.96	5.438E-03	727.17	11.800	7.206E-01	BI212

861.03	62.	20.34	1.10	4.675E-03				
911.71	145.	11.44	1.20	4.444E-03	911.07	29.000	7.987E-01	AC228
969.14	111.	17.53	1.63	4.211E-03	968.90	17.460	1.078E+00	AC228
1121.57	43.	30.23	1.34	3.711E-03	1120.28	15.040	5.495E-01	BI214
1461.65	609.	4.05	1.60	2.941E-03	1460.75	10.700	1.387E+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		
148.33	74.72	451.	151.	0.076	64.45	1.005 BI-207	D	
154.33	77.72	385.	303.	0.152	32.38	1.007 PB-214	D	
175.24	87.93	390.	86.	0.043	102.73	1.014 PB-214	D	
179.80	90.21	372.	78.	0.039	110.39	1.016 PB-214	D	
185.42	93.02	306.	118.	0.059	68.93	1.018 TH-234	D	
418.75	209.54	202.	77.	0.038	85.45	0.888 AC-228		
477.54	238.84	126.	684.	0.342	13.41	1.122 PB-212	D	
541.40	270.84	192.	80.	0.040	91.86	1.463 AC-228	s	
555.85	278.06	120.	41.	0.021	124.92	0.722 NP-239	l	
655.26	327.74	117.	65.	0.032	87.27	1.094 AC-228		
925.85	462.98	94.	44.	0.022	118.64	0.955 AC-228	l	
1722.35	861.03	29.	62.	0.031	61.03	1.099 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	Centroid	Background	Net Area	Intensity	Uncert	FWHM	
	Channel	Energy	Counts	Counts	Cts/Sec	3 Sigma %	keV	
PB-212	149.24	74.83	1001.	174.	0.087	78.10	1.499	
PB-214	153.79	77.11	875.	290.	0.145	46.15	1.499D	
PB-212	153.79	77.11	871.	293.	0.147	46.15	1.499D	
EU-155	174.17	87.29	882.	109.	0.054	119.61	1.499s	
CD-109	174.24	87.33	845.	110.	0.055	115.03	1.499s	
TH-234	185.91	93.17	818.	112.	0.056	105.87	1.499s	
RA-226	372.02	186.18	442.	80.	0.040	116.52	1.499	
PB-212	477.50	238.90	392.	567.	0.283	19.19	1.499	
RA-224	483.38	241.84	428.	88.	0.044	103.88	1.499s	
PB-214	591.04	295.65	178.	153.	0.077	43.62	1.499	
AC-228	677.18	338.70	130.	136.	0.068	46.32	1.444s	
PB-214	704.26	352.23	114.	232.	0.116	27.48	1.499s	
TL-208	1021.21	510.63	88.	72.	0.036	59.44	1.506s	
TL-208	1167.45	583.72	84.	218.	0.109	30.37	1.269s	
BI-214	1219.38	609.67	47.	172.	0.086	29.87	1.103	
BI-212	1455.82	727.83	41.	64.	0.032	60.00	1.965s	
AC-228	1823.76	911.71	44.	143.	0.072	34.32	1.196	
AC-228	1938.69	969.14	66.	110.	0.055	52.58	1.628s	

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
BI-214	2243.72	1121.57	42.	43.	0.021	90.70	1.339
K-40	2924.32	1461.65	2.	607.	0.303	12.16	1.597

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

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

- Nuclide -		Average	----- Peak -----		-----		
Name	Code	Activity	Energy	Activity	Code	MDA Value	COMMENTS
		pCi/gm	keV	pCi/gm		pCi/gm	
BE-7		7.4179E-02	477.56	7.418E-02	%(	3.809E-01 1.11E-01	G
K-40		1.3866E+01	1460.75	1.387E+01	(P	2.228E-01 5.64E-01	G
MN-54		3.5746E-03	834.81	3.575E-03	%(P	4.255E-02 1.19E-02	G
CO-57		-1.3301E-02	122.07-1.330E-02	%(	4.888E-02 1.47E-02	G K	
			136.43-3.519E-02	%	3.111E-01 9.24E-02	G	
CO-60		5.6917E-03	1332.51 5.692E-03	%(P	4.607E-02 1.26E-02	G K	
			1173.23 1.944E-02	& P	6.735E-02 1.98E-02	G K	
Sr-85		-1.8350E-02	514.00-1.835E-02	%(	5.426E-02 1.62E-02	G	
Kr-85		-4.3924E+02	513.99-4.392E+02	%(P	1.227E+03 3.65E+02	G	
Y-88		-4.1853E-04	1836.01-4.185E-04	&(	4.462E-02 1.11E-02	G K	
			898.02-6.897E-05	& P	5.262E-02 1.45E-02	G	
NB-94		-9.6403E-04	871.10-9.640E-04	%(P	4.339E-02 1.19E-02	G K	
			702.50-1.151E-02	& P	4.918E-02 1.44E-02	G K	
Ag-108M		-8.5893E-03	722.95-8.589E-03	%(	5.469E-02 1.58E-02	G K	
			614.37-1.968E-02	% P	5.289E-02 1.58E-02	G	
			433.93-2.325E-03	%	3.872E-02 1.11E-02	G	

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CD-109	1.0862E+00	88.04	1.086E+00	(P	1.362E+00	4.18E-01	G
SN-113	1.2304E-03	391.71	1.230E-03	%(	5.729E-02	1.65E-02	G K
		255.04	4.449E-03	% P	1.820E+00	5.32E-01	G
SB-125	2.0137E-02	427.95	2.014E-02	%(P	1.195E-01	3.48E-02	G K
		600.77	4.628E-02	% P	2.266E-01	6.59E-02	G
		636.15	8.190E-02	% P	3.309E-01	9.62E-02	G
		463.51	2.816E-01	% P	3.967E-01	1.23E-01	G
		176.29	1.199E-01	& P	6.225E-01	1.85E-01	G
I-131	1.4543E-02	364.48	1.454E-02	&(	4.988E-02	1.48E-02	G K
		636.97	1.888E-01	%	8.036E-01	2.36E-01	G
		284.29	7.826E-02	%	7.393E-01	2.17E-01	G
CS-134	-1.3774E-02	604.66	1.377E-02	%(P	5.255E-02	1.54E-02	G K
		795.76	3.301E-02	% P	6.108E-02	1.87E-02	G
		569.29	3.717E-02	% P	2.724E-01	7.83E-02	G
		801.84	1.292E-01	&	6.126E-01	1.78E-01	G
CS-137	2.6551E-02	661.62	2.655E-02	%(P	6.026E-02	1.81E-02	G
CE-139	-9.7235E-03	165.85	9.724E-03	%(P	4.970E-02	1.48E-02	G
EU-152	-4.0931E-02	121.78	4.093E-02	%(P	1.380E-01	4.14E-02	G K
		344.30	7.612E-04	% P	1.350E-01	3.89E-02	G
		1408.08	9.305E-05	& P	2.033E-01	5.23E-02	G
		964.00	7.976E-03	% P	5.695E-01	1.63E-01	G
		1112.07	1.738E-01	% P	4.360E-01	1.30E-01	G
		778.90	1.822E-01	% P	2.980E-01	9.28E-02	G
EU-154	-2.1490E-02	123.10	2.149E-02	%(P	1.076E-01	3.22E-02	G K
		1274.80	1.714E-03	% P	1.757E-01	4.84E-02	G
		723.30	1.017E-02	% P	1.939E-01	5.38E-02	G
		1004.80	5.311E-02	% P	3.415E-01	9.80E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
EU-155	1.2506E-01	86.45	1.251E-01	(	1.626E-01	4.99E-02	G K
		105.31	0.000E+00	%	2.009E-01	5.97E-02	G
HG-203	2.1998E-02	279.17	2.200E-02	%(	3.878E-02	1.19E-02	G K
		72.87-3.570E-01		& P	1.234E+00	3.71E-01	G
		70.83-4.095E-01		&	2.127E+00	6.39E-01	G
		82.50-8.452E-01		%	2.568E+00	7.74E-01	G
TL-208	2.7920E-01	583.14	2.729E-01	@(P	5.684E-02	2.79E-02	G
		510.72	3.032E-01	*(P	1.956E-01	7.34E-02	G
PB-212	6.3467E-01	238.63	6.077E-01	(P	1.018E-01	3.93E-02	G K
							Energy duplication
		77.11	7.011E-01	(	3.353E-01	1.08E-01	G
PB-214	4.2253E-01	74.81	7.872E-01	& P	6.804E-01	2.11E-01	G
		351.99	4.112E-01	*(P	9.321E-02	3.80E-02	G K
		295.22	4.445E-01	(P	1.883E-01	6.54E-02	G
							Energy duplication
BI-212	7.2064E-01	77.11	1.132E+00	+ P	5.495E-01	1.76E-01	G
		241.92	1.558E-01	% P	6.237E-01	1.87E-01	G
		727.17	7.206E-01	(P	3.633E-01	1.46E-01	G K
		1620.56-1.614E-01		%	1.810E+00	4.86E-01	G
BI-214	4.1873E-01	785.42-2.171E-01		% P	1.971E+00	5.51E-01	G
		609.32	4.187E-01	(P	8.438E-02	4.20E-02	G K
		1764.51-1.578E-02		% P	3.563E-01	9.24E-02	G
RA-224	1.0512E+00	1120.28	5.495E-01	+ P	4.261E-01	1.68E-01	G
		241.00	1.051E+00	(P	1.184E+00	3.67E-01	G
RA-226	9.4338E-01	185.99	9.434E-01	(	1.188E+00	3.66E-01	G
AC-228	7.7555E-01	911.07	7.987E-01	(P	1.874E-01	9.26E-02	G K
		968.90	1.078E+00	+ P	3.964E-01	1.90E-01	G
		338.40	7.196E-01	(P	2.944E-01	1.13E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TH-227	-1.8908E-01						
		236.00	1.891E-01	%(P	4.482E-01	1.35E-01	G K
		256.25	4.190E-02	% P	5.361E-01	1.58E-01	G
PA-234	5.0725E-02						
		98.44	5.072E-02	%(	1.700E-01	5.11E-02	G K
		946.00	4.096E-02	%	3.090E-01	8.88E-02	G
		131.28	1.598E-03	&	2.042E-01	6.06E-02	G
		94.67	1.535E-01	%	3.314E-01	1.00E-01	G
		883.24	8.248E-02	%	4.120E-01	1.19E-01	G
		926.70	8.026E-02	%	4.933E-01	1.42E-01	G
		569.26	4.855E-02	%	4.013E-01	1.16E-01	G
TH-234	8.2596E-01						
		63.29	4.221E-01	%(P	2.050E+00	6.12E-01	G K
		92.80	1.351E+00	(P	1.639E+00	5.03E-01	G
		92.38	1.342E-01	% P	1.821E+00	5.37E-01	G
AM-241	1.7769E-04						
		59.54	1.777E-04	%(P	2.046E-01	6.02E-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:

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

Peak Codes:

G - Gamma Ray
X - X-Ray
P - Positron Decay
S - Single-Escape
D - Double-Escape
K - Key Line
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 *****					
Time of Count		Time Corrected		3 Sigma	
Nuclide	Activity	Activity	Counting	Total	MDA
	pCi/gm	pCi/gm	pCi/gm	pCi/gm	pCi/gm
BE-7 #A	7.1940E-02	7.4179E-02	3.3387E-01	3.3390E-01	3.694E-01
K-40	1.3866E+01	1.3866E+01	1.6920E+00	1.8646E+00	
MN-54 #A	3.5559E-03	3.5746E-03	3.5589E-02	3.5590E-02	4.233E-02
CO-57 #B	-1.3221E-02	-1.3301E-02	4.4066E-02	4.4073E-02	4.859E-02
CO-60 #B	5.6869E-03	5.6917E-03	3.7877E-02	3.7879E-02	4.603E-02
Sr-85 #A	-1.7893E-02	-1.8350E-02	4.8674E-02	4.8685E-02	5.291E-02
Kr-85 #A	-4.3924E+02	-4.3924E+02	1.2341E+03	1.2343E+03	1.227E+03
Y-88 #B	-4.1215E-04	-4.1853E-04	3.3210E-02	3.3210E-02	4.394E-02
NB-94 #B	-9.6403E-04	-9.6403E-04	5.5323E-02	5.5323E-02	4.339E-02
Ag-108M#B	-8.5890E-03	-8.5893E-03	4.7409E-02	4.7412E-02	5.469E-02
CD-109 #A	1.0823E+00	1.0862E+00	1.2548E+00	1.2562E+00	1.357E+00
SN-113 #B	1.2131E-03	1.2304E-03	4.9438E-02	4.9438E-02	5.648E-02
SB-125 #B	2.0105E-02	2.0137E-02	1.0437E-01	1.0437E-01	1.193E-01
I-131 #B	1.1864E-02	1.4543E-02	4.4418E-02	4.4425E-02	4.069E-02
CS-134 #B	-1.3744E-02	-1.3774E-02	5.1354E-02	5.1359E-02	5.244E-02
CS-137 #A	2.6547E-02	2.6551E-02	5.4413E-02	5.4434E-02	6.025E-02
CE-139 #A	-9.6084E-03	-9.7235E-03	4.5952E-02	4.5955E-02	4.911E-02
EU-152 #B	-4.0916E-02	-4.0931E-02	1.3002E-01	1.3004E-01	1.379E-01
EU-154 #B	-2.1479E-02	-2.1490E-02	1.0377E-01	1.0378E-01	1.075E-01
EU-155 #A	1.2495E-01	1.2506E-01	1.4958E-01	1.4974E-01	1.624E-01
HG-203 #B	2.1238E-02	2.1998E-02	3.5570E-02	3.5591E-02	3.744E-02
TL-208 #	2.7920E-01	2.7920E-01	8.5718E-02	8.7158E-02	
PB-212 #	6.3467E-01	6.3467E-01	1.2313E-01	1.2825E-01	1.018E-01
PB-214 #	4.2253E-01	4.2253E-01	1.1010E-01	1.1266E-01	9.321E-02
BI-212	7.2064E-01	7.2064E-01	4.3694E-01	4.3883E-01	
BI-214	4.1873E-01	4.1873E-01	1.2588E-01	1.2808E-01	
RA-224 #A	1.0512E+00	1.0512E+00	1.1008E+00	1.1024E+00	1.184E+00
RA-226 #A	9.4338E-01	9.4338E-01	1.0992E+00	1.1005E+00	1.188E+00
AC-228	7.7555E-01	7.7555E-01	2.2690E-01	2.3109E-01	
TH-227 #B	-1.8908E-01	-1.8908E-01	4.1415E-01	4.1428E-01	4.482E-01
PA-234 #B	5.0725E-02	5.0725E-02	1.5338E-01	1.5341E-01	1.700E-01
TH-234 #B	8.2596E-01	8.2596E-01	9.2270E-01	9.2383E-01	2.050E+00
AM-241 #A	1.7769E-04	1.7769E-04	1.8045E-01	1.8045E-01	2.046E-01

- All peaks for activity calculation had bad shape.
 * - Activity omitted from total
 & - Activity omitted from total and all peaks had bad shape.
 < - MDA value printed.
 A - Activity printed, but activity < MDA.
 B - Activity < MDA and failed test.
 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) 1.6060604E+01 pCi/gm
Total Decayed Activity (270.6 to 1999.1 keV) 1.6060604E+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-13-01-009-F

Spectrum Filename: C:\GammaVision\Spectra\101F_19JUL2006_2027.An1

Acquisition information

Start time: 19-Jul-2006 20:27:43
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: 1.6950E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.6950E+03) =
 5.8997E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	17-Jul-2006 11:20:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	101_150K_28APR05.Pbc 01-May-2005 05:24:47
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 16 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.4841

***** S U M M A R Y O F P E A K S I N R A N G E *****								
Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
62.93	79.	40.45	0.75	1.096E-02				
62.93	79.	40.45	0.75	1.096E-02	63.29	3.900	PBC<MDA	TH234
74.37	160.	21.04	1.00	1.651E-02				
74.37	160.	21.04	1.00	1.651E-02	74.81	9.600	PBC<MDA	PB212
77.36	360.	9.61	1.01	1.736E-02	77.11	17.500	9.539E-01	PB212
					77.11	10.700	1.544E+00	PB214
93.06	129.	32.21	1.50	1.989E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
129.61	72.	40.45	1.30	2.109E-02				
186.50	100.	26.74	1.02	1.855E-02	185.99	3.280	1.303E+00	RA226
209.42	108.	28.23	1.26	1.721E-02				
238.93	912.	3.79	1.12	1.557E-02	238.63	43.100	1.076E+00	PB212
241.75	130.	19.96	1.12	1.542E-02	241.00	3.900	1.714E+00	RA224
					241.92	7.470	8.978E-01	PB214
270.47	90.	30.61	1.19	1.399E-02				
295.62	149.	13.72	1.20	1.290E-02	295.22	19.200	4.741E-01	PB214
300.68	70.	31.53	0.88	1.270E-02				
328.12	66.	31.07	0.99	1.169E-02				
338.67	122.	17.12	1.07	1.134E-02	338.40	12.010	6.978E-01	AC228
352.20	278.	9.04	1.27	1.092E-02	351.99	37.100	5.429E-01	PB214
464.02	35.	38.14	1.50	8.342E-03	463.51	10.000	PBC<MDA	SB125
511.84	127.	17.50	1.38	7.574E-03	510.72	22.500	5.180E-01	TL208
583.69	243.	8.71	1.22	6.679E-03	583.14	86.000	3.333E-01	TL208
609.56	196.	11.04	1.57	6.410E-03	609.32	46.090	5.262E-01	BI214
662.08	31.	35.60	1.50	5.937E-03	661.62	84.620	PBC<MDA	CS137
728.28	55.	23.59	1.63	5.435E-03	727.17	11.800	6.718E-01	BI212
911.75	159.	10.52	1.76	4.444E-03	911.07	29.000	9.728E-01	AC228

969.13	132.	15.44	1.93	4.211E-03	968.90	17.460	1.421E+00	AC228
1121.37	50.	20.28	1.76	3.708E-03	1120.28	15.040	7.088E-01	BI214
1461.64	611.	4.14	2.15	2.941E-03	1460.75	10.700	1.542E+01	K40
1766.13	32.	19.08	1.61	2.481E-03	1764.51	15.920	6.552E-01	BI214

***** 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
125.41	62.93	450.	79.	0.040	121.36	0.749	PA-234
148.30	74.72	487.	160.	0.080	63.13	1.005	BI-207
154.30	77.72	419.	360.	0.180	28.82	1.007	PB-214
418.52	209.42	326.	108.	0.054	84.70	1.261	AC-228
477.58	238.73	142.	912.	0.456	11.38	1.122	PB-212
540.67	270.47	232.	90.	0.045	91.84	1.190	AC-228
601.10	300.68	170.	70.	0.035	94.60	0.877	PB-212
656.01	328.12	140.	66.	0.033	93.22	0.991	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
HG-203	145.87	73.15	1089.	-116.	-0.058	123.64	1.499s
PB-212	149.29	74.86	1130.	177.	0.089	81.10	1.499s
PB-212	153.79	77.11	928.	341.	0.171	41.18	1.499D
PB-214	153.79	77.11	932.	338.	0.169	41.18	1.499D
TH-234	185.70	93.06	888.	129.	0.065	96.64	1.499s
RA-226	372.24	186.29	473.	105.	0.053	92.47	1.499
PB-212	477.53	238.91	451.	674.	0.337	17.48	1.499
RA-224	481.70	241.00	639.	118.	0.059	94.18	1.123D
PB-214	590.91	295.58	199.	153.	0.077	45.46	1.499
AC-228	677.12	338.67	127.	119.	0.060	51.36	1.073
PB-214	704.29	352.25	134.	276.	0.138	25.10	1.499
SB-125	927.94	464.02	81.	35.	0.018	114.42	1.499s
TL-208	1023.62	511.84	124.	111.	0.055	52.51	1.378s
TL-208	1167.39	583.69	73.	240.	0.120	26.12	1.225
BI-214	1219.15	609.56	84.	195.	0.098	33.13	1.571s
CS-137	1324.24	662.08	50.	31.	0.016	106.81	1.499
BI-212	1456.71	728.28	44.	54.	0.027	70.77	1.634
AC-228	1823.85	911.75	44.	157.	0.079	31.56	1.759s
AC-228	1938.67	969.13	68.	131.	0.066	46.32	1.927
BI-214	2243.33	1121.37	24.	50.	0.025	60.83	1.757
K-40	2924.29	1461.64	9.	609.	0.304	12.43	2.149
BI-214	3533.69	1766.13	3.	32.	0.016	57.24	1.613

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

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****						
- Nuclide -	Average	----- Peak -----				
Name	Code	Activity	Energy	Activity	Code MDA Value	
		pCi/gm	keV	pCi/gm	pCi/gm	COMMENTS
BE-7		6.9882E-02				
			477.56	6.988E-02	&(4.040E-01 1.17E-01	G
K-40		1.5419E+01				
			1460.75	1.542E+01	(P 4.242E-01 6.42E-01	G
MN-54		-1.3209E-02				
			834.81	-1.321E-02	&(P 5.106E-02 1.48E-02	G
CO-57		-2.9367E-03				
			122.07	-2.937E-03	&(5.780E-02 1.72E-02	G K
			136.43	-3.913E-02	% 4.633E-01 1.38E-01	G
CO-60		6.7459E-04				
			1332.51	6.746E-04	%(P 5.962E-02 1.61E-02	G K
			1173.23	-3.362E-04	% P 8.709E-02 2.46E-02	G K
Sr-85		-2.8099E-03				
			514.00	-2.810E-03	&(6.499E-02 1.89E-02	G
Kr-85		-9.2916E+01				
			513.99	-9.292E+01	&(P 1.468E+03 4.26E+02	G
Y-88		-2.2304E-03				
			1836.01	-2.230E-03	%(5.791E-02 1.50E-02	G K
			898.02	6.553E-03	& P 5.698E-02 1.61E-02	G
NB-94		6.1686E-03				
			871.10	6.169E-03	%(P 4.276E-02 1.20E-02	G K
			702.50	6.771E-03	% P 5.258E-02 1.51E-02	G K
Ag-108M		-2.3573E-02				
			722.95	-2.357E-02	&(6.653E-02 1.98E-02	G K
			614.37	-1.421E-02	% P 6.556E-02 1.93E-02	G
			433.93	1.906E-02	& 4.987E-02 1.50E-02	G
CD-109		1.0467E+00				
			88.04	1.047E+00	%(P 1.576E+00 4.81E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SN-113	9.2481E-03	391.71	9.248E-03	% (	6.599E-02	1.93E-02	G K
		255.04	6.140E-02	& P	2.227E+00	6.55E-01	G
SB-125	5.6341E-02	427.95	3.853E-02	& (P	1.644E-01	4.85E-02	G K
		600.77	7.756E-02	% P	2.556E-01	7.55E-02	G
		636.15	1.039E-01	% P	4.833E-01	1.41E-01	G
		463.51	3.372E-01	* (P	4.272E-01	1.34E-01	G
		176.29	1.330E-01	% P	7.329E-01	2.18E-01	G
I-131	-1.2564E-02	364.48	1.256E-02	% (	5.976E-02	1.76E-02	G K
		636.97	5.683E-02	%	7.188E-01	2.03E-01	G
		284.29	1.743E-01	%	7.647E-01	2.27E-01	G
CS-134	-1.6119E-02	604.66	1.612E-02	% (P	6.207E-02	1.83E-02	G K
		795.76	3.990E-02	% P	5.983E-02	1.87E-02	G
		569.29	9.419E-02	& P	3.230E-01	9.55E-02	G
		801.84	0.000E+00	%	6.383E-01	1.79E-01	G
CS-137	4.9461E-02	661.62	4.946E-02	(P	5.657E-02	1.81E-02	G
CE-139	9.8092E-03	165.85	9.809E-03	% (P	4.980E-02	1.49E-02	G
EU-152	-9.5429E-03	121.78	9.543E-03	& (P	1.665E-01	4.96E-02	G K
		344.30	3.590E-02	& P	1.548E-01	4.58E-02	G
		1408.08	5.423E-04	% P	2.834E-01	7.57E-02	G
		964.00	8.837E-03	% P	7.910E-01	2.30E-01	G
		1112.07	1.184E-01	% P	5.275E-01	1.53E-01	G
		778.90	9.228E-02	% P	4.441E-01	1.29E-01	G
EU-154	-1.8432E-03	123.10	1.843E-03	& (P	1.168E-01	3.47E-02	G K
		1274.80	1.626E-03	% P	1.593E-01	4.29E-02	G
		723.30	3.458E-02	& P	3.028E-01	8.70E-02	G
		1004.80	6.537E-02	& P	2.822E-01	8.11E-02	G
EU-155	5.9579E-02	86.45	5.958E-02	% (	1.517E-01	4.58E-02	G K
		105.31	8.630E-02	%	2.168E-01	6.55E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
HG-203	2.3797E-03	279.17	2.380E-03	% (	5.738E-02	1.69E-02	G K
		72.87	5.902E-01	& P	1.418E+00	4.29E-01	G
		70.83	1.804E+00	+	2.428E+00	7.43E-01	G
		82.50	1.147E+00	%	2.917E+00	8.82E-01	G
TL-208	3.3330E-01	583.14	3.333E-01	(P	5.885E-02	2.93E-02	G
		510.72	5.180E-01	+ P	2.549E-01	1.04E-01	G
PB-212	8.3864E-01	238.63	8.007E-01	(P	1.208E-01	4.71E-02	G K
							Energy duplication
		77.11	9.043E-01	(	3.831E-01	1.24E-01	G
		74.81	8.894E-01	?(P	8.000E-01	2.48E-01	G
PB-214	5.2558E-01	351.99	5.431E-01	(P	1.113E-01	4.58E-02	G K
		295.22	4.918E-01	(P	2.202E-01	7.54E-02	G
							Energy duplication
		77.11	1.463E+00	+ P	6.278E-01	2.03E-01	G
		241.92	1.569E-01	% P	8.723E-01	2.61E-01	G
BI-212	6.7183E-01	727.17	6.718E-01	(P	4.168E-01	1.61E-01	G K
		1620.56	6.234E-01	%	1.606E+00	4.76E-01	G
		785.42	6.570E-01	% P	2.759E+00	8.03E-01	G
BI-214	5.8852E-01	609.32	5.262E-01	*(P	1.225E-01	5.85E-02	G K
		1764.51	6.552E-01	(P	2.045E-01	1.27E-01	G
		1120.28	7.088E-01	(P	3.674E-01	1.45E-01	G
RA-224	1.5648E+00	241.00	1.565E+00	(P	1.594E+00	4.94E-01	G
RA-226	1.3763E+00	185.99	1.376E+00	(	1.362E+00	4.24E-01	G
AC-228	9.7275E-01	911.07	9.728E-01	(P	2.071E-01	1.04E-01	G K
		968.90	1.421E+00	+ P	4.457E-01	2.21E-01	G
		338.40	6.978E-01	- P	3.226E-01	1.22E-01	G
TH-227	-2.9161E-01	236.00	2.916E-01	%(P	5.482E-01	1.67E-01	G K
		256.25	2.065E-01	% P	6.372E-01	1.91E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
PA-234	6.0112E-04	98.44	6.011E-04	%	(	1.972E-01	5.86E-02 G K
		946.00	4.542E-02	&		2.430E-01	6.92E-02 G
		131.28	3.665E-02	%		2.525E-01	7.55E-02 G
		94.67	1.031E-01	%		3.760E-01	1.13E-01 G
		883.24	8.971E-02	&		4.982E-01	1.44E-01 G
		926.70	2.739E-02	%		4.474E-01	1.24E-01 G
		569.26	1.434E-01	&		4.770E-01	1.41E-01 G

TH-234	1.2803E+00	63.29	9.389E-01	%	(P	2.351E+00	7.09E-01 G K
		92.80	1.724E+00		(P	1.891E+00	5.82E-01 G
		92.38	3.657E-02	&	P	2.277E+00	6.76E-01 G

AM-241	-1.0928E-01	59.54	1.093E-01	%	(P	3.344E-01	1.01E-01 G
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(- This peak used in the nuclide activity average.

- * - Peak is too wide, but only one peak in library.
- ! - Peak is part of a multiplet and this area went negative during deconvolution.
- ? - Peak is too narrow.
- @ - Peak is too wide at FW25M, but ok at FWHM.
- % - Peak fails sensitivity test.
- \$ - Peak identified, but first peak of this nuclide failed one or more qualification tests.
- + - Peak activity higher than counting uncertainty range.
- - Peak activity lower than counting uncertainty range.
- = - Peak outside analysis energy range.
- & - Calculated peak centroid is not close enough to the 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 - Half-life 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 *****						
Time of Count		Time Corrected		Uncertainty		3 Sigma
Nuclide	Activity	Activity	Counting	Total	MDA	
	pCi/gm	pCi/gm	pCi/gm	pCi/gm	pCi/gm	
BE-7 #A	6.7756E-02	6.9882E-02	3.5244E-01	3.5246E-01	3.917E-01	
K-40	1.5419E+01	1.5419E+01	1.9235E+00	2.1116E+00		
MN-54 #A	-1.3139E-02	-1.3209E-02	4.9230E-02	4.9236E-02	5.079E-02	
CO-57 #B	-2.9188E-03	-2.9367E-03	5.1644E-02	5.1645E-02	5.745E-02	
CO-60 #B	6.7401E-04	6.7459E-04	4.8217E-02	4.8217E-02	5.957E-02	
Sr-85 #A	-2.7393E-03	-2.8099E-03	5.6715E-02	5.6715E-02	6.335E-02	
Kr-85 #A	-9.2914E+01	-9.2916E+01	2.4301E+03	2.4301E+03	1.468E+03	
Y-88 #B	-2.1962E-03	-2.2304E-03	4.5081E-02	4.5081E-02	5.702E-02	
NB-94 #B	6.1686E-03	6.1686E-03	3.5983E-02	3.5985E-02	4.276E-02	
Ag-108M#B	-2.3572E-02	-2.3573E-02	5.9538E-02	5.9553E-02	6.652E-02	
CD-109 #A	1.0429E+00	1.0467E+00	1.4437E+00	1.4448E+00	1.570E+00	
SN-113 #B	9.1164E-03	9.2481E-03	5.7846E-02	5.7849E-02	6.505E-02	
SB-125 #B	5.6250E-02	5.6341E-02	6.7115E-02	6.7190E-02	1.641E-01	
I-131 #B	-1.0233E-02	-1.2564E-02	5.2826E-02	5.2831E-02	4.867E-02	
CS-134 #B	-1.6084E-02	-1.6119E-02	6.0444E-02	6.0450E-02	6.194E-02	
CS-137 #A	4.9454E-02	4.9461E-02	5.4326E-02	5.4398E-02	5.657E-02	
CE-139 #A	9.6922E-03	9.8092E-03	4.4578E-02	4.4581E-02	4.921E-02	
EU-152 #B	-9.5395E-03	-9.5429E-03	1.8396E-01	1.8396E-01	1.665E-01	
EU-154 #B	-1.8423E-03	-1.8432E-03	2.8248E-01	2.8248E-01	1.168E-01	
EU-155 #B	5.9525E-02	5.9579E-02	1.3744E-01	1.3748E-01	1.515E-01	
HG-203 #B	2.2969E-03	2.3797E-03	5.0564E-02	5.0564E-02	5.539E-02	
TL-208	3.3330E-01	3.3330E-01	8.7922E-02	8.9917E-02		
PB-212 #	8.3864E-01	8.3864E-01	1.4790E-01	1.5531E-01	1.208E-01	
PB-214 #	5.2558E-01	5.2558E-01	1.3288E-01	1.3616E-01	1.113E-01	
BI-212	6.7183E-01	6.7183E-01	4.8141E-01	4.8291E-01		
BI-214	5.8852E-01	5.8852E-01	1.7801E-01	1.8109E-01		
RA-224 A	1.5648E+00	1.5648E+00	1.4827E+00	1.4853E+00		
RA-226 #	1.3763E+00	1.3763E+00	1.2727E+00	1.2750E+00	1.362E+00	
AC-228	9.7275E-01	9.7275E-01	3.1060E-01	3.1543E-01		
TH-227 #B	-2.9161E-01	-2.9161E-01	5.0651E-01	5.0677E-01	5.482E-01	
PA-234 #B	6.0112E-04	6.0112E-04	1.7573E-01	1.7573E-01	1.972E-01	
TH-234 #B	1.2803E+00	1.2803E+00	1.2965E+00	1.2985E+00	2.351E+00	
AM-241 #A	-1.0928E-01	-1.0928E-01	3.1497E-01	3.1503E-01	3.344E-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 (270.1 to 1999.1 keV) 1.9550503E+01 pCi/gm
Total Decayed Activity (270.1 to 1999.1 keV) 1.9550503E+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-13-01-017-F-B

Spectrum Filename: C:\GammaVision\Spectra\101F_20JUL2006_1550.An1

Acquisition information

Start time: 20-Jul-2006 15:50:45
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: 1.8370E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.8370E+03) =
 5.4437E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	18-Jul-2006 14:42:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	101_150K_28APR05.Pbc 01-May-2005 05:24:47
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 14 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.4521

***** S U M M A R Y O F P E A 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	183.	24.50	1.50	1.654E-02	74.81	9.600	8.455E-01	PB212	
77.11	282.	15.62	1.50	1.720E-02	77.11	10.700	1.125E+00	PB214	
					77.11	17.500	6.879E-01	PB212	
77.11	285.	15.62	1.50	1.720E-02	77.11	10.700	1.125E+00	PB214	
					77.11	17.500	6.970E-01	PB212	
87.02	118.	24.02	1.01	1.918E-02	86.45	32.740	1.392E-01	EU155	
93.54	93.	29.80	1.02	1.997E-02	92.80	3.000	PBC<MDA	TH234	
186.14	77.	31.03	1.14	1.857E-02	185.99	3.280	9.293E-01	RA226	
209.72	122.	21.38	0.90	1.719E-02					
238.92	681.	4.52	1.12	1.556E-02	238.63	43.100	7.394E-01	PB212	
241.84	88.	22.53	1.12	1.540E-02	241.00	3.900	PBC<MDA	RA224	
					241.92	7.470	PBC<MDA	PB214	
270.52	60.	35.88	0.91	1.399E-02					
295.60	118.	19.10	0.81	1.290E-02	295.22	19.200	3.461E-01	PB214	
338.54	173.	13.29	1.06	1.135E-02	338.40	12.010	9.240E-01	AC228	
352.19	247.	11.20	1.19	1.092E-02	351.99	37.100	4.440E-01	PB214	
463.25	41.	27.45	1.50	8.342E-03	463.51	10.000	3.651E-01	SB125	
511.07	117.	14.64	1.51	7.585E-03	510.72	22.500	4.349E-01	TL208	
583.73	181.	9.85	1.74	6.678E-03	583.14	86.000	2.288E-01	TL208	
609.89	152.	10.67	1.44	6.407E-03	609.32	46.090	3.753E-01	BI214	
662.03	44.	29.65	1.36	5.934E-03	661.62	84.620	6.372E-02	CS137	
727.54	74.	21.27	1.22	5.440E-03	727.17	11.800	8.352E-01	BI212	
794.86	50.	31.99	1.36	5.021E-03					
794.86	50.	31.99	1.36	5.021E-03	795.76	85.400	8.445E-02	CS134	
911.88	142.	10.00	1.67	4.443E-03	911.07	29.000	8.017E-01	AC228	
968.91	101.	16.81	2.22	4.212E-03	968.90	17.460	1.003E+00	AC228	
1120.80	90.	21.85	1.89	3.711E-03	1120.28	15.040	1.184E+00	BI214	

1461.67	621.	4.07	1.90	2.941E-03	1460.75	10.700	1.446E+01	K40
1765.41	25.	20.00	0.92	2.481E-03	1764.51	15.920	4.574E-01	BI214

***** U N I D E N T I F I E D P E A K S U M M A R Y *****									
Channel	Peak Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide		
173.62	86.99	344.	118.	0.059	72.06	1.014	TB-160	1D	
419.11	209.72	240.	122.	0.061	64.13	0.898	NP-239	s	
477.54	238.93	132.	681.	0.340	13.55	1.122	PB-212	D	
483.38	241.85	152.	88.	0.044	67.58	1.124	PB-214	D	
540.76	270.52	174.	60.	0.030	107.65	0.912	AC-228		

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

This section based on library: FSS_Rev_1.Lib

***** I D E N T I F I E D P E A K S U M M A R Y *****								
Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	
PB-212	149.29	74.86	970.	183.	0.091	73.51	1.499	
PB-214	153.79	77.11	854.	282.	0.141	46.87	1.499D	
PB-212	153.79	77.11	850.	285.	0.143	46.87	1.499D	
TH-234	185.83	93.12	786.	141.	0.071	84.08	1.499s	
RA-226	372.01	186.18	431.	84.	0.042	110.41	1.499	
PB-212	477.58	238.94	375.	528.	0.264	20.02	1.499	
PB-214	590.85	295.55	180.	105.	0.052	60.50	1.499	
AC-228	676.86	338.54	135.	171.	0.086	39.88	1.064s	
PB-214	704.28	352.24	127.	211.	0.105	30.32	1.499s	
SB-125	926.39	463.25	49.	41.	0.021	82.35	1.499s	
TL-208	1022.08	511.07	79.	101.	0.050	43.92	1.514s	
TL-208	1167.47	583.73	55.	179.	0.089	29.55	1.742s	
BI-214	1219.82	609.89	49.	151.	0.075	32.00	1.440	
CS-137	1324.16	662.04	45.	41.	0.021	80.86	1.499s	
BI-212	1455.24	727.54	51.	73.	0.036	63.80	1.225s	
CS-134	1591.25	795.51	39.	36.	0.018	88.19	1.502s	
AC-228	1824.11	911.88	23.	141.	0.070	30.01	1.674	
AC-228	1938.24	968.91	53.	100.	0.050	50.43	2.218s	
BI-214	2242.19	1120.80	65.	90.	0.045	65.54	1.889s	
K-40	2924.35	1461.67	7.	619.	0.309	12.21	1.900	
BI-214	3532.25	1765.41	0.	25.	0.012	60.00	0.916s	

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

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****							
- Nuclide -		Average	----- Peak -----				
Name	Code	Activity pCi/gm	Energy keV	Activity pCi/gm	Code	MDA Value pCi/gm	COMMENTS
BE-7		2.3344E-02	477.56	2.334E-02	% (	3.514E-01 1.00E-01	G
K-40		1.4456E+01	1460.75	1.446E+01	(P	3.571E-01 5.91E-01	G
MN-54		6.7977E-03	834.81	6.798E-03	& (P	4.049E-02 1.14E-02	G
CO-57		8.2193E-03	122.07	8.219E-03	% (	4.594E-02 1.37E-02	G K
			136.43	1.608E-02	&	3.874E-01 1.15E-01	G
CO-60		2.0131E-03	1332.51	2.013E-03	% (P	4.270E-02 1.12E-02	G K
			1173.23	2.057E-02	% P	6.270E-02 1.85E-02	G K
Sr-85		-1.0849E-02	514.00	-1.085E-02	% (	5.501E-02 1.62E-02	G
Kr-85		-2.7272E+02	513.99	-2.727E+02	% (P	1.248E+03 3.66E+02	G
Y-88		0.0000E+00	1836.01	0.000E+00	% (	5.200E-02 1.32E-02	G K
			898.02	-7.071E-03	% P	5.598E-02 1.59E-02	G
NB-94		-2.1200E-04	871.10	-2.120E-04	% (P	5.729E-02 1.61E-02	G K
			702.50	1.439E-02	% P	4.301E-02 1.27E-02	G K
Ag-108M		-1.0855E-02	722.95	-1.086E-02	% (	5.630E-02 1.64E-02	G K
			614.37	-1.897E-02	& P	5.975E-02 1.78E-02	G
			433.93	1.273E-02	%	3.882E-02 1.15E-02	G
CD-109		-1.1198E-01	88.04	-1.120E-01	% (P	1.527E+00 4.56E-01	G
SN-113		1.8336E-02	391.71	1.834E-02	& (	6.102E-02 1.82E-02	G K
			255.04	-4.540E-03	& P	1.911E+00 5.60E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	1.0451E-01						
		427.95	1.649E-02	&(P	1.306E-01	3.79E-02	G K
		600.77	6.072E-02	% P	2.659E-01	7.79E-02	G
		636.15	1.757E-01	% P	3.719E-01	1.13E-01	G
		463.51	3.651E-01	@(P	3.121E-01	1.04E-01	G
		176.29	1.046E-01	% P	5.996E-01	1.79E-01	G
I-131	-1.7971E-02						
		364.48	1.797E-02	%(	5.737E-02	1.71E-02	G K
		636.97	2.958E-01	%	7.601E-01	2.28E-01	G
		284.29	1.112E-02	%	5.689E-01	1.64E-01	G
CS-134	3.5350E-02						
		604.66	1.222E-02	&(P	4.381E-02	1.29E-02	G K
		795.76	6.179E-02	@(P	5.491E-02	1.84E-02	G
		569.29	3.846E-02	& P	2.477E-01	7.09E-02	G
		801.84	1.823E-01	%	3.965E-01	1.20E-01	G
CS-137	6.0668E-02						
		661.62	6.067E-02	*(P	4.962E-02	1.67E-02	G
CE-139	2.5458E-04						
		165.85	2.546E-04	&(P	5.122E-02	1.52E-02	G
EU-152	1.5927E-02						
		121.78	1.593E-02	%(P	1.352E-01	4.03E-02	G K
		344.30	3.243E-02	% P	1.099E-01	3.25E-02	G
		1408.08	1.532E-02	% P	1.944E-01	5.11E-02	G
		964.00	5.504E-03	% P	6.627E-01	1.91E-01	G
		1112.07	6.407E-02	% P	4.644E-01	1.32E-01	G
		778.90	9.314E-02	% P	3.023E-01	8.86E-02	G
EU-154	8.2153E-03						
		123.10	8.215E-03	%(P	1.059E-01	3.15E-02	G K
		1274.80	2.671E-02	% P	1.864E-01	5.30E-02	G
		723.30	5.617E-02	% P	2.610E-01	7.58E-02	G
		1004.80	3.404E-02	& P	3.066E-01	8.65E-02	G
EU-155	3.1627E-03						
		86.45	3.163E-03	&(	1.783E-01	5.32E-02	G K
		105.31	7.719E-02	%	1.794E-01	5.43E-02	G
HG-203	8.5475E-03						
		279.17	8.548E-03	%(	4.678E-02	1.38E-02	G K
		72.87	1.254E-02	% P	1.495E+00	4.47E-01	G
		70.83	1.163E+00	&	2.243E+00	6.81E-01	G
		82.50	7.941E-02	%	2.526E+00	7.52E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	2.2883E-01	583.14	2.288E-01	(P	4.776E-02	2.29E-02	G
		510.72	4.349E-01	+ P	1.901E-01	7.38E-02	G
PB-212	6.1292E-01	238.63	5.788E-01	(P	1.018E-01	3.91E-02	G K
		77.11	6.970E-01	(	3.387E-01	1.09E-01	G
		74.81	8.455E-01	& P	6.849E-01	2.13E-01	G
PB-214	3.8271E-01	351.99	3.827E-01	@(P	1.002E-01	3.90E-02	G K
		295.22	3.111E-01	- P	1.934E-01	6.38E-02	G
		77.11	1.125E+00	+ P	5.551E-01	1.78E-01	G
		241.92-2.056E-03	% P	7.591E-01	2.25E-01		G
BI-212	8.3523E-01	727.17	8.352E-01	*(P	4.125E-01	1.79E-01	G K
		1620.56	5.225E-01	%	1.490E+00	4.35E-01	G
		785.42	1.238E+00	% P	2.128E+00	6.57E-01	G
BI-214	3.9639E-01	609.32	3.753E-01	(P	8.811E-02	4.04E-02	G K
		1764.51	4.574E-01	(P	1.372E-01	9.32E-02	G
		1120.28	1.184E+00	+ P	5.316E-01	2.60E-01	G
RA-224	8.2963E-01	241.00	8.296E-01	&(P	1.265E+00	3.87E-01	G
RA-226	1.0084E+00	185.99	1.008E+00	(	1.200E+00	3.71E-01	G
AC-228	8.8697E-01	911.07	8.017E-01	(P	1.442E-01	8.13E-02	G K
		968.90	1.003E+00	@(P	3.655E-01	1.70E-01	G
		338.40	9.240E-01	@(P	3.066E-01	1.24E-01	G
TH-227	-1.7890E-01	236.00-1.789E-01	% (P	4.430E-01	1.34E-01	G K	
		256.25	6.614E-04	% P	5.998E-01	1.76E-01	G
PA-234	-3.0796E-02	98.44-3.080E-02	&(	1.832E-01	5.48E-02	G K	
		946.00-1.018E-02	&	2.613E-01	7.29E-02	G	
		131.28	5.582E-03	%	2.315E-01	6.89E-02	G
		94.67-2.980E-02	%	3.027E-01	9.03E-02	G	
		883.24	2.123E-03	%	3.322E-01	8.99E-02	G
		926.70-5.444E-02	%	4.662E-01	1.32E-01	G	

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
		569.26-7.933E-02	&		3.790E-01	1.10E-01	G
TH-234	9.6214E-01						
		63.29	3.631E-01	%	2.217E+00	6.62E-01	G K
		92.80	1.741E+00	(P	1.644E+00	5.09E-01	G
		92.38-1.444E-01	& P	1.901E+00	5.61E-01	G	

AM-241 -4.8374E-02
59.54-4.837E-02 &(P 3.098E-01 9.26E-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:

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 *****						
		Time of Count	Time Corrected	Uncertainty	3 Sigma	
Nuclide		Activity	Activity	Counting	Total	MDA
		pCi/gm	pCi/gm	pCi/gm	pCi/gm	pCi/gm
BE-7	#A	2.2732E-02	2.3344E-02	3.0078E-01	3.0078E-01	3.422E-01
K-40		1.4456E+01	1.4456E+01	1.7712E+00	1.9505E+00	
MN-54	#A	6.7668E-03	6.7977E-03	3.4331E-02	3.4333E-02	4.030E-02
CO-57	#B	8.1762E-03	8.2193E-03	4.1185E-02	4.1187E-02	4.570E-02
CO-60	#B	2.0116E-03	2.0131E-03	3.3746E-02	3.3747E-02	4.267E-02

Sr-85	#A	-1.0614E-02	-1.0849E-02	4.8629E-02	4.8633E-02	5.382E-02
Kr-85	#A	-2.7271E+02	-2.7272E+02	1.3368E+03	1.3369E+03	1.248E+03
Y-88	#B	0.0000E+00	0.0000E+00	3.9606E-02	3.9606E-02	5.132E-02
NB-94	#B	-2.1200E-04	-2.1200E-04	1.2846E-02	1.2846E-02	5.729E-02
Ag-108M	#B	-1.0855E-02	-1.0855E-02	4.9091E-02	4.9095E-02	5.630E-02
CD-109	#A	-1.1163E-01	-1.1198E-01	1.4893E+00	1.4894E+00	1.522E+00
SN-113	#B	1.8112E-02	1.8336E-02	5.4466E-02	5.4476E-02	6.028E-02
SB-125	#B	1.0437E-01	1.0451E-01	8.9079E-02	8.9274E-02	1.304E-01
I-131	#B	-1.5063E-02	-1.7971E-02	5.1348E-02	5.1358E-02	4.809E-02
CS-134	#B	3.5284E-02	3.5350E-02	3.1536E-02	3.1599E-02	4.373E-02
CS-137	#	6.0661E-02	6.0668E-02	5.0101E-02	5.0218E-02	4.962E-02
CE-139	#A	2.5197E-04	2.5458E-04	4.5472E-02	4.5472E-02	5.069E-02
EU-152	#B	1.5922E-02	1.5927E-02	1.2083E-01	1.2083E-01	1.352E-01
EU-154	#B	8.2116E-03	8.2153E-03	9.4635E-02	9.4636E-02	1.059E-01
EU-155	#B	3.1602E-03	3.1627E-03	1.5952E-01	1.5952E-01	1.782E-01
HG-203	#B	8.2911E-03	8.5475E-03	4.1537E-02	4.1540E-02	4.537E-02
TL-208		2.2883E-01	2.2883E-01	6.8510E-02	6.9720E-02	
PB-212	#	6.1292E-01	6.1292E-01	1.2415E-01	1.2889E-01	1.018E-01
PB-214	#	3.8271E-01	3.8271E-01	1.1712E-01	1.1910E-01	1.002E-01
BI-212	#	8.3523E-01	8.3523E-01	5.3779E-01	5.3986E-01	
BI-214		3.9639E-01	3.9639E-01	1.2778E-01	1.2972E-01	
RA-224	#A	8.2963E-01	8.2963E-01	1.1607E+00	1.1617E+00	1.265E+00
RA-226	#A	1.0084E+00	1.0084E+00	1.1134E+00	1.1148E+00	1.200E+00
AC-228		8.8697E-01	8.8697E-01	2.1187E-01	2.1772E-01	
TH-227	#B	-1.7890E-01	-1.7890E-01	4.0945E-01	4.0957E-01	4.430E-01
PA-234	#B	-3.0796E-02	-3.0796E-02	1.6443E-01	1.6444E-01	1.832E-01
TH-234	#B	9.6214E-01	9.6214E-01	8.4440E-01	8.4609E-01	2.217E+00
AM-241	#A	-4.8374E-02	-4.8374E-02	3.0314E-01	3.0315E-01	3.098E-01

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

----- S U M M A R Y -----
 Total Activity (270.1 to 1999.1 keV) 1.6803764E+01 pCi/gm
 Total Decayed Activity (270.1 to 1999.1 keV) 1.6803764E+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-13-01-007-F

Spectrum Filename: C:\GammaVision\Spectra\101F_20JUL2006_1627.An1

Acquisition information

Start time: 20-Jul-2006 16:27:27
Live time: 2000
Real time: 2001
Dead time: 0.06 %
Detector ID: 1

Detector system

Det 101- DSPE-633

Calibration

Filename: D1_1LSa.Clb
Detector 101 1.0 Liter Marinelli Sand

Energy Calibration

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

Efficiency Calibration

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

Library Files

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

Analysis parameters

Analysis engine: Env32 G53W4.20
Start channel: 100 (50.23keV)
Stop channel: 4000 (1999.11keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 9.6400E+02
Activity scaling factor: $1.0000\text{E}+06 / (1.0000\text{E}+00 * 9.6400\text{E}+02) = 1.0373\text{E}+03$
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	18-Jul-2006 11:00:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	101_150K_28APR05.Pbc 01-May-2005 05:24:47
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 8 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.3564

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

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
77.02	183.	16.21	1.50	1.720E-02	77.11	10.700	1.397E+00	PB214
					77.11	17.500	8.544E-01	PB212
77.02	187.	16.21	1.50	1.720E-02	77.11	10.700	1.397E+00	PB214
					77.11	17.500	8.717E-01	PB212
87.25	79.	26.16	1.01	1.921E-02	86.45	32.740	1.765E-01	EU155
					88.04	3.790	PBC<MDA	CD109
90.41	57.	30.90	1.02	1.962E-02				
93.33	85.	21.76	1.02	1.995E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
186.49	84.	25.11	0.75	1.855E-02	185.99	3.280	1.920E+00	RA226
207.61	53.	32.38	0.46	1.731E-02				
239.11	465.	6.97	1.15	1.555E-02	238.63	43.100	9.580E-01	PB212
270.80	64.	28.08	1.53	1.398E-02				
295.55	93.	20.91	1.55	1.291E-02	295.22	19.200	5.166E-01	PB214
338.76	100.	18.39	0.80	1.134E-02	338.40	12.010	1.008E+00	AC228
352.26	129.	12.94	1.68	1.092E-02	351.99	37.100	4.383E-01	PB214
511.70	67.	22.06	0.83	7.576E-03	510.72	22.500	4.159E-01	TL208
583.41	101.	14.48	1.38	6.682E-03	583.14	86.000	2.400E-01	TL208
609.87	65.	19.91	1.34	6.407E-03	609.32	46.090	3.049E-01	BI214
662.42	30.	26.35	1.50	5.937E-03	661.62	84.620	8.400E-02	CS137
911.67	76.	15.49	1.14	4.444E-03	911.07	29.000	8.005E-01	AC228
969.84	39.	24.90	1.62	4.212E-03	968.90	17.460	7.432E-01	AC228
1461.79	303.	5.74	1.79	2.941E-03	1460.75	10.700	1.339E+01	K40
1765.11	19.	22.94	1.58	2.481E-03	1764.51	15.920	6.587E-01	BI214

***** U N I D E N T I F I E D P E A K S U M M A R Y *****									
Channel	Peak Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide		
180.41	90.39	127.	57.	0.029	92.70	1.016	PB-214	1D	
186.05	93.31	137.	78.	0.039	71.84	1.018	U-235	D	
414.89	207.61	112.	53.	0.027	97.13	0.462	U-237	s	
477.92	239.11	554.	88.	0.044	117.50	1.154	PB-212		
541.33	270.80	95.	64.	0.032	74.97	1.530	AC-228	s	
677.31	338.76	132.	43.	0.022	121.81	0.801	AC-228	s	

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

This section based on library: FSS_Rev_1.Lib

***** I D E N T I F I E D P E A K S U M M A R Y *****									
Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV		
PB-214	153.79	77.11	371.	183.	0.092	48.64	1.499D		
PB-212	153.79	77.11	367.	187.	0.094	48.64	1.499D		
CD-109	174.40	87.41	336.	99.	0.050	83.45	1.499s		
TH-234	186.11	93.26	345.	82.	0.041	93.88	1.499s		
RA-226	372.00	186.17	156.	72.	0.036	82.12	1.499s		
PB-212	477.54	238.92	206.	315.	0.157	25.08	1.499		
RA-224	483.53	241.91	195.	55.	0.027	113.75	1.499s		
PB-214	591.20	295.73	94.	71.	0.036	65.90	1.499s		
AC-228	677.40	338.81	73.	59.	0.029	70.10	1.499s		
PB-214	704.18	352.19	48.	87.	0.043	45.35	1.499s		
TL-208	1023.34	511.70	64.	51.	0.025	66.17	0.826s		
TL-208	1166.83	583.41	34.	98.	0.049	43.45	1.385		
BI-214	1219.78	609.87	35.	64.	0.032	59.73	1.335		
CS-137	1324.93	662.42	19.	30.	0.015	79.05	1.499s		
AC-228	1823.95	911.80	14.	59.	0.030	45.47	1.578		
AC-228	1940.09	969.84	30.	39.	0.019	74.69	1.616s		
K-40	2924.59	1461.79	2.	301.	0.150	17.23	1.788		
BI-214	3531.67	1765.11	0.	19.	0.009	68.82	1.582		

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

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****							
- Nuclide -		Average	----- Peak -----				
Name	Code	Activity pCi/gm	Energy keV	Activity pCi/gm	Code	MDA Value pCi/gm	COMMENTS
BE-7		1.4800E-01	477.56	1.480E-01	&(	4.288E-01 1.26E-01	G
K-40		1.3389E+01	1460.75	1.339E+01	(P	4.340E-01 7.76E-01	G
MN-54		1.4552E-02	834.81	1.455E-02	%(P	5.842E-02 1.65E-02	G
CO-57		1.7089E-02	122.07	1.709E-02	%(	5.888E-02 1.76E-02	G K
			136.43	4.735E-03	%	4.923E-01 1.44E-01	G
CO-60		-1.3868E-02	1332.51-1.387E-02		&(P	1.050E-01 2.92E-02	G K
			1173.23-7.403E-04		& P	1.054E-01 2.87E-02	G K
Sr-85		-1.1193E-02	514.00-1.119E-02		&(	8.526E-02 2.47E-02	G
Kr-85		-3.0304E+02	513.99-3.030E+02		&(P	1.935E+03 5.58E+02	G
Y-88		0.0000E+00	1836.01	0.000E+00	%(	4.411E-02 5.99E-03	G K
			898.02-1.533E-02		& P	8.634E-02 2.44E-02	G
NB-94		5.4091E-03	871.10	5.409E-03	&(P	6.518E-02 1.77E-02	G K
			702.50-3.957E-03		& P	6.515E-02 1.80E-02	G K
Ag-108M		1.3603E-02	722.95	1.360E-02	%(	6.326E-02 1.80E-02	G K
			614.37-7.750E-03		% P	7.335E-02 2.07E-02	G
			433.93	2.670E-03	&	4.528E-02 1.25E-02	G
CD-109		1.9071E+00	88.04	1.907E+00	(P	1.692E+00 5.33E-01	G
SN-113		-7.2992E-03	391.71-7.299E-03		%(	9.302E-02 2.67E-02	G K
			255.04	4.906E-01	% P	2.043E+00 6.01E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	-3.8364E-02	427.95	3.836E-02	% (P	1.863E-01	5.39E-02	G K
		600.77	3.869E-02	% P	3.443E-01	9.70E-02	G
		636.15	5.335E-02	& P	4.542E-01	1.25E-01	G
		463.51	2.493E-01	% P	6.323E-01	1.88E-01	G
		176.29	2.481E-01	% P	6.917E-01	2.07E-01	G
I-131	5.2033E-03	364.48	5.203E-03	& (	5.316E-02	1.49E-02	G K
		636.97	9.626E-02	%	8.138E-01	2.24E-01	G
		284.29	1.097E-01	&	9.300E-01	2.69E-01	G
CS-134	1.6456E-02	604.66	1.646E-02	& (P	6.545E-02	1.89E-02	G K
		795.76	4.733E-02	% P	6.358E-02	2.06E-02	G
		569.29	7.532E-02	% P	3.840E-01	1.10E-01	G
		801.84	2.973E-03	&	7.443E-01	2.00E-01	G
CS-137	8.3999E-02	661.62	8.400E-02	*(P	6.383E-02	2.28E-02	G
CE-139	9.3635E-03	165.85	9.364E-03	& (P	6.456E-02	1.91E-02	G
EU-152	5.1054E-02	121.78	5.105E-02	% (P	1.746E-01	5.22E-02	G K
		344.30	4.718E-02	% P	2.004E-01	5.85E-02	G
		1408.08	1.048E-02	& P	4.089E-01	1.07E-01	G
		964.00	1.236E-01	% P	6.289E-01	1.78E-01	G
		1112.07	2.828E-03	& P	6.964E-01	1.88E-01	G
		778.90	8.355E-02	% P	5.707E-01	1.61E-01	G
EU-154	3.5369E-02	123.10	3.537E-02	% (P	1.170E-01	3.49E-02	G K
		1274.80	4.107E-02	% P	3.049E-01	8.56E-02	G
		723.30	1.859E-02	% P	4.859E-01	1.37E-01	G
		1004.80	4.151E-02	& P	4.707E-01	1.30E-01	G
EU-155	-1.4333E-02	86.45	1.433E-02	& (	2.493E-01	7.40E-02	G K
		105.31	6.331E-02	&	2.404E-01	7.18E-02	G
HG-203	-1.9617E-02	279.17	1.962E-02	& (	6.976E-02	2.07E-02	G K
		72.87	9.998E-01	% P	1.724E+00	5.23E-01	G
		70.83	4.689E-02	&	2.636E+00	7.78E-01	G
		82.50	3.737E-02	%	3.760E+00	1.11E+00	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	2.4001E-01	583.14	2.400E-01	(P	7.245E-02	3.56E-02	G
		510.72	4.159E-01	+ P	3.290E-01	1.21E-01	G
PB-212	6.5753E-01	238.63	6.575E-01	(P	1.453E-01	5.60E-02	G K
		77.11	8.717E-01	+	4.284E-01	1.41E-01	G
		74.81	6.285E-01	& P	9.213E-01	2.82E-01	G
PB-214	3.3506E-01	351.99	3.001E-01	(P	1.206E-01	4.64E-02	G K
		295.22	4.026E-01	*(P	2.705E-01	9.06E-02	G
		77.11	1.397E+00	+ P	7.040E-01	2.31E-01	G
		241.92	-1.927E-02	% P	8.445E-01	2.46E-01	G
BI-212	-1.5080E-01	727.17	-1.508E-01	%(P	6.325E-01	1.81E-01	G K
		1620.56	0.000E+00	%	1.401E+00	1.90E-01	G
		785.42	1.185E+00	& P	3.362E+00	9.91E-01	G
BI-214	3.0493E-01	609.32	3.049E-01	(P	1.431E-01	6.18E-02	G K
		1764.51	6.587E-01	+ P	2.615E-01	1.55E-01	G
		1120.28	-1.275E-02	& P	5.797E-01	1.54E-01	G
RA-224	1.2769E+00	241.00	1.277E+00	&(P	1.577E+00	4.90E-01	G
RA-226	1.6467E+00	185.99	1.647E+00	*(	1.402E+00	4.51E-01	G
AC-228	6.6455E-01	911.07	6.419E-01	(P	2.192E-01	1.00E-01	G K
		968.90	7.432E-01	*(P	5.360E-01	1.88E-01	G
		338.40	6.049E-01	@(P	4.381E-01	1.47E-01	G
TH-227	-1.9383E-01	236.00	-1.938E-01	&(P	5.559E-01	1.67E-01	G K
		256.25	-1.078E-01	% P	7.594E-01	2.21E-01	G
PA-234	-1.8940E-02	98.44	-1.894E-02	%(	2.085E-01	6.15E-02	G K
		946.00	-6.573E-02	%	3.973E-01	1.12E-01	G
		131.28	0.000E+00	%	2.775E-01	8.15E-02	G
		94.67	-1.474E-01	%	4.352E-01	1.31E-01	G
		883.24	1.863E-01	%	4.979E-01	1.47E-01	G
		926.70	1.908E-01	&	6.178E-01	1.80E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
		569.26	1.216E-01	%	5.643E-01	1.63E-01	G
TH-234	1.3451E+00						
		63.29	8.933E-01	%(P	2.766E+00	8.25E-01	G K
		92.80	1.932E+00	(P	2.097E+00	6.50E-01	G
		92.38	5.616E-01	% P	2.793E+00	8.20E-01	G

AM-241 -1.8931E-02
59.54-1.893E-02 &(P 4.047E-01 1.19E-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:

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 *****						
		Time of Count	Time Corrected	Uncertainty	3 Sigma	
Nuclide		Activity	Activity	Counting	Total	MDA
		pCi/gm	pCi/gm	pCi/gm	pCi/gm	pCi/gm
BE-7	#A	1.4378E-01	1.4800E-01	3.7944E-01	3.7954E-01	4.166E-01
K-40		1.3389E+01	1.3389E+01	2.3251E+00	2.4451E+00	
MN-54	#A	1.4480E-02	1.4552E-02	4.9635E-02	4.9641E-02	5.813E-02
CO-57	#B	1.6991E-02	1.7089E-02	5.2829E-02	5.2838E-02	5.854E-02
CO-60	#B	-1.3856E-02	-1.3868E-02	9.2652E-02	9.2655E-02	1.049E-01

Sr-85	#A	-1.0930E-02	-1.1193E-02	7.4208E-02	7.4211E-02	8.325E-02
Kr-85	#A	-3.0304E+02	-3.0304E+02	2.3473E+03	2.3473E+03	1.935E+03
Y-88	#B	0.0000E+00	0.0000E+00	1.7957E-02	1.7960E-02	4.348E-02
NB-94	#B	5.4091E-03	5.4091E-03	5.3169E-02	5.3169E-02	6.518E-02
Ag-108M	#B	1.3602E-02	1.3603E-02	5.3927E-02	5.3932E-02	6.326E-02
CD-109	#	1.9006E+00	1.9071E+00	1.5989E+00	1.6024E+00	1.686E+00
SN-113	#B	-7.2020E-03	-7.2992E-03	8.0063E-02	8.0064E-02	9.178E-02
SB-125	#B	-3.8306E-02	-3.8364E-02	1.7667E-01	1.7668E-01	1.860E-01
I-131	#B	4.2942E-03	5.2033E-03	4.4567E-02	4.4568E-02	4.387E-02
CS-134	#B	1.6422E-02	1.6456E-02	5.6817E-02	5.6824E-02	6.532E-02
CS-137	#	8.3987E-02	8.3999E-02	6.8354E-02	6.8518E-02	6.382E-02
CE-139	#A	9.2590E-03	9.3635E-03	5.7205E-02	5.7208E-02	6.384E-02
EU-152	#B	5.1037E-02	5.1054E-02	1.5660E-01	1.5663E-01	1.745E-01
EU-154	#B	3.5351E-02	3.5369E-02	1.0484E-01	1.0486E-01	1.169E-01
EU-155	#B	-1.4321E-02	-1.4333E-02	2.2206E-01	2.2206E-01	2.491E-01
HG-203	#B	-1.8977E-02	-1.9617E-02	6.2169E-02	6.2179E-02	6.748E-02
TL-208		2.4001E-01	2.4001E-01	1.0680E-01	1.0765E-01	
PB-212	#	6.5753E-01	6.5753E-01	1.6813E-01	1.7219E-01	1.453E-01
PB-214	#	3.3506E-01	3.3506E-01	1.3728E-01	1.3858E-01	1.206E-01
BI-212	#B	-1.5080E-01	-1.5080E-01	6.5944E-01	6.5949E-01	6.325E-01
BI-214		3.0493E-01	3.0493E-01	1.8528E-01	1.8608E-01	
RA-224	#A	1.2769E+00	1.2769E+00	1.4713E+00	1.4731E+00	1.577E+00
RA-226	#	1.6467E+00	1.6467E+00	1.3523E+00	1.3555E+00	1.402E+00
AC-228	#	6.6455E-01	6.6455E-01	2.5520E-01	2.5795E-01	2.192E-01
TH-227	#B	-1.9383E-01	-1.9383E-01	5.1801E-01	5.1813E-01	5.559E-01
PA-234	#B	-1.8940E-02	-1.8940E-02	1.8435E-01	1.8436E-01	2.085E-01
TH-234	#B	1.3451E+00	1.3451E+00	1.3577E+00	1.3597E+00	2.766E+00
AM-241	#A	-1.8931E-02	-1.8931E-02	5.5020E-01	5.5020E-01	4.047E-01

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

----- S U M M A R Y -----
Total Activity (186.2 to 1999.1 keV) 1.3934277E+01 pCi/gm
Total Decayed Activity (186.2 to 1999.1 keV) 1.3934277E+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-13-01-008-F

Spectrum Filename: C:\GammaVision\Spectra\101F_20JUL2006_1703.An1

Acquisition information

Start time: 20-Jul-2006 17:03:54
Live time: 2000
Real time: 2002
Dead time: 0.10 %
Detector ID: 1

Detector system

Det 101- DSPE-633

Calibration

Filename: D1_1LSa.Clb
Detector 101 1.0 Liter Marinelli Sand

Energy Calibration

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

Efficiency Calibration

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

Library Files

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

Analysis parameters

Analysis engine: Env32 G53W4.20
Start channel: 100 (50.23keV)
Stop channel: 4000 (1999.11keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 1.7300E+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	18-Jul-2006 12:00:00
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: 0.3280

***** S U M M A R Y O F P E A 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	156.	32.10	1.50	1.654E-02				
74.73	156.	32.10	1.50	1.654E-02	74.81	9.600	PBC<MDA	PB212
77.16	373.	13.05	1.50	1.720E-02	77.11	10.700	1.585E+00	PB214
					77.11	17.500	9.690E-01	PB212
77.16	377.	13.05	1.50	1.720E-02	77.11	10.700	1.585E+00	PB214
					77.11	17.500	9.787E-01	PB212
86.89	135.	24.01	1.01	1.913E-02				
90.24	130.	21.97	1.02	1.958E-02	88.04	3.790	PBC<MDA	CD109
93.33	156.	18.57	1.02	1.993E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	1.958E+00	TH234
186.15	119.	25.94	1.39	1.857E-02	185.99	3.280	1.530E+00	RA226
209.68	124.	24.72	1.08	1.719E-02				
239.03	1076.	4.33	1.12	1.555E-02	238.63	43.100	1.245E+00	PB212
270.24	69.	27.48	0.94	1.400E-02				
277.56	73.	33.04	0.82	1.367E-02				
277.56	73.	33.04	0.82	1.367E-02	279.17	81.500	5.331E-02	HG203
295.47	187.	12.56	1.01	1.291E-02	295.22	19.200	5.845E-01	PB214
300.52	52.	31.83	1.26	1.271E-02				
328.15	51.	39.03	0.74	1.169E-02				
338.59	180.	12.48	1.13	1.134E-02	338.40	12.010	1.020E+00	AC228
352.25	268.	11.56	1.19	1.092E-02	351.99	37.100	5.121E-01	PB214
463.68	61.	33.61	1.12	8.339E-03	463.51	10.000	5.623E-01	SB125
511.01	153.	12.97	1.92	7.586E-03	510.72	22.500	6.283E-01	TL208
583.52	271.	9.83	1.27	6.680E-03	583.14	86.000	3.653E-01	TL208
600.13	25.	19.97	1.50	6.459E-03	600.77	18.400	PBC<MDA	SB125
					604.66	97.600	3.113E-02	CS134
609.58	217.	9.51	1.16	6.410E-03	609.32	46.090	5.700E-01	BI214

727.92	50.	32.62	1.26	5.438E-03	727.17	11.800	5.999E-01	BI212
911.84	197.	9.42	1.50	4.443E-03	911.07	29.000	1.181E+00	AC228
969.12	163.	10.53	1.35	4.211E-03	968.90	17.460	1.719E+00	AC228
1119.62	62.	28.82	1.35	3.713E-03	1120.28	15.040	8.666E-01	BI214
1461.70	654.	3.99	2.01	2.941E-03	1460.75	10.700	1.617E+01	K40
1621.14	17.	29.98	0.80	2.682E-03	1620.56	2.750	1.758E+00	BI212

***** U N I D E N T I F I E D				P E A K	S U M M A R Y *****		
Peak Centroid	Background	Net Area	Intensity	Uncert	FWHM	Suspected	
Channel	Energy	Counts	Counts	Cts/Sec	3 Sigma %	keV	Nuclide
173.36	86.71	460.	135.	0.068	72.03	1.014	BI-207 1D
180.05	90.06	344.	130.	0.065	65.90	1.016	PB-214 1D
419.04	209.68	337.	124.	0.062	74.15	1.084	NP-239 s
477.76	239.03	1235.	217.	0.108	71.78	1.122	PB-212
540.20	270.24	140.	69.	0.035	82.44	0.935	AC-228 s
554.85	277.56	197.	73.	0.037	99.12	0.819	NP-239 l
600.79	300.52	111.	52.	0.026	95.50	1.261	PB-212
656.07	328.15	141.	51.	0.025	117.08	0.743	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	149.03	74.73	1258.	156.	0.078	96.30	1.499
PB-214	153.79	77.11	1026.	373.	0.187	39.14	1.499D
PB-212	153.79	77.11	1023.	377.	0.189	39.14	1.499D
TH-234	185.99	93.20	934.	125.	0.062	101.94	1.499
RA-226	371.95	186.15	382.	119.	0.060	77.81	1.390s
PB-212	477.54	238.92	459.	773.	0.386	15.81	1.499
PB-214	590.91	295.58	199.	173.	0.086	41.00	1.499
AC-228	676.97	338.59	138.	178.	0.089	37.45	1.130
PB-214	704.37	352.28	180.	235.	0.117	30.85	1.499s
SB-125	926.59	463.35	98.	41.	0.021	108.62	1.499s
TL-208	1021.96	511.01	100.	137.	0.069	38.91	1.915s
TL-208	1167.05	583.52	121.	269.	0.134	29.49	1.273
CS-134	1200.29	600.13	1.	25.	0.013	59.92	1.499s
BI-214	1219.20	609.58	68.	216.	0.108	28.53	1.158
BI-212	1455.99	727.92	73.	49.	0.025	97.86	1.256
AC-228	1824.03	911.84	45.	195.	0.097	28.26	1.498
AC-228	1938.65	969.12	39.	162.	0.081	31.59	1.353s
BI-214	2239.83	1119.62	67.	62.	0.031	86.47	1.352s
K-40	2924.43	1461.70	10.	652.	0.326	11.98	2.010
BI-212	3243.51	1621.14	2.	17.	0.008	89.93	0.804s

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

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****							
- Nuclide -		Average	----- Peak -----				
Name	Code	Activity pCi/gm	Energy keV	Activity pCi/gm	Code	MDA Value pCi/gm	COMMENTS
BE-7		1.5497E-01	477.56	1.550E-01	% (	4.762E-01 1.42E-01	G
K-40		1.6174E+01	1460.75	1.617E+01	(P	4.343E-01 6.48E-01	G
MN-54		-1.1503E-03	834.81	-1.150E-03	%(P	5.241E-02 1.45E-02	G
CO-57		1.1291E-02	122.07	1.129E-02	& (	5.088E-02 1.52E-02	G K
			136.43	3.766E-03	&	4.510E-01 1.34E-01	G
CO-60		9.2041E-03	1332.51	9.204E-03	%(P	5.757E-02 1.62E-02	G K
			1173.23	2.486E-02	& P	6.797E-02 2.02E-02	G K
Sr-85		-1.4239E-02	514.00	-1.424E-02	%(	6.177E-02 1.83E-02	G
Kr-85		-3.4938E+02	513.99	-3.494E+02	%(P	1.398E+03 4.12E+02	G
Y-88		1.2601E-02	1836.01	1.260E-02	%(	4.239E-02 1.20E-02	G K
			898.02	-3.477E-04	& P	3.283E-02 8.35E-03	G
NB-94		-4.5605E-03	871.10	-4.560E-03	%(P	5.325E-02 1.50E-02	G K
			702.50	-8.281E-03	& P	5.969E-02 1.73E-02	G K
Ag-108M		2.5041E-02	722.95	2.504E-02	& (	5.372E-02 1.63E-02	G K
			614.37	-4.000E-02	% P	7.140E-02 2.18E-02	G
			433.93	6.548E-03	%	5.013E-02 1.46E-02	G
CD-109		5.9861E-01	88.04	5.986E-01	%(P	1.625E+00 4.91E-01	G
SN-113		4.4174E-03	391.71	4.417E-03	& (	5.190E-02 1.49E-02	G K
			255.04	5.112E-01	& P	1.972E+00 5.88E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	9.1803E-02						
		427.95	7.193E-03	&(P	1.649E-01	4.78E-02	G K
		600.77	6.232E-02	% P	2.607E-01	7.62E-02	G
		636.15	1.118E-01	% P	3.634E-01	1.07E-01	G
		463.51	3.848E-01	*(P	4.591E-01	1.44E-01	G
		176.29	1.577E-01	% P	7.014E-01	2.10E-01	G
I-131	-9.2672E-03						
		364.48	9.267E-03	% (	5.983E-02	1.75E-02	G K
		636.97	2.136E-01	%	6.442E-01	1.90E-01	G
		284.29	1.529E-01	&	8.544E-01	2.53E-01	G
CS-134	3.1132E-02						
		604.66	3.113E-02	&(P	9.150E-03	6.37E-03	G K
		795.76	3.827E-02	% P	5.584E-02	1.75E-02	G
		569.29	2.877E-02	& P	3.128E-01	8.96E-02	G
		801.84	0.000E+00	%	8.540E-01	2.44E-01	G
CS-137	2.2270E-02						
		661.62	2.227E-02	%(P	6.940E-02	2.06E-02	G
CE-139	-6.9212E-04						
		165.85	6.921E-04	%(P	5.113E-02	1.51E-02	G
EU-152	2.3631E-02						
		121.78	2.363E-02	&(P	1.441E-01	4.30E-02	G K
		344.30	1.662E-02	% P	1.634E-01	4.78E-02	G
		1408.08	5.091E-02	& P	3.143E-01	8.85E-02	G
		964.00	1.535E-01	% P	5.696E-01	1.68E-01	G
		1112.07	2.517E-03	& P	5.338E-01	1.49E-01	G
		778.90	2.620E-02	& P	4.349E-01	1.23E-01	G
EU-154	3.2910E-02						
		123.10	3.291E-02	%(P	1.111E-01	3.34E-02	G K
		1274.80	5.859E-02	% P	1.877E-01	5.51E-02	G
		723.30	9.211E-03	& P	1.898E-01	5.17E-02	G
		1004.80	2.789E-02	& P	3.528E-01	9.96E-02	G
EU-155	4.3270E-02						
		86.45	4.327E-02	%(	1.629E-01	4.90E-02	G K
		105.31	9.123E-02	%	2.380E-01	7.19E-02	G
HG-203	3.5398E-02						
		279.17	3.540E-02	%(	4.950E-02	1.53E-02	G K
		72.87	2.376E-01	% P	9.902E-01	2.97E-01	G
		70.83	1.118E+00	&	2.025E+00	6.16E-01	G
		82.50	9.826E-01	%	3.055E+00	9.22E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	3.6528E-01	583.14	3.653E-01	(P	7.339E-02	3.62E-02	G
		510.72	6.283E-01	+ P	2.251E-01	9.10E-02	G
PB-212	9.2213E-01	238.63	8.992E-01	(P	1.194E-01	4.78E-02	G K
		77.11	9.787E-01	(	3.937E-01	1.28E-01	G
		74.81	7.655E-01	- P	8.264E-01	2.54E-01	G
PB-214	4.8366E-01	351.99	4.527E-01	@(P	1.258E-01	4.69E-02	G K
		295.22	5.435E-01	(P	2.153E-01	7.50E-02	G
		77.11	1.585E+00	+ P	6.450E-01	2.09E-01	G
		241.92-2.843E-01	% P	7.503E-01	2.26E-01		G
BI-212	8.1880E-01	727.17	5.999E-01	(P	5.161E-01	1.99E-01	G K
		1620.56	1.758E+00	(	1.052E+00	5.27E-01	G
		785.42	1.311E+00	% P	2.612E+00	7.95E-01	G
BI-214	5.7005E-01	609.32	5.700E-01	(P	1.090E-01	5.45E-02	G K
		1764.51-3.823E-02	% P	3.316E-01	8.58E-02		G
		1120.28	8.666E-01	+ P	5.721E-01	2.51E-01	G
RA-224	1.0315E+00	241.00	1.031E+00	%(P	1.462E+00	4.48E-01	G
RA-226	1.5302E+00	185.99	1.530E+00	*(	1.201E+00	3.97E-01	G
AC-228	1.1338E+00	911.07	1.181E+00	(P	2.059E-01	1.12E-01	G K
		968.90	1.719E+00	+ P	3.383E-01	1.82E-01	G
		338.40	1.020E+00	(P	3.292E-01	1.29E-01	G
TH-227	-4.3328E-01	236.00-4.333E-01	%(P	5.988E-01	1.83E-01		G K
		256.25-1.588E-01	% P	6.842E-01	2.04E-01		G
PA-234	-1.0550E-01	98.44-1.055E-01	%(	1.715E-01	5.23E-02		G K
		946.00	3.347E-03	%	2.835E-01	7.88E-02	G
		131.28-6.307E-03	%	2.336E-01	6.95E-02		G
		94.67-1.333E-01	%	3.787E-01	1.14E-01		G
		883.24	4.271E-02	%	3.679E-01	1.03E-01	G
		926.70-1.341E-02	%	4.991E-01	1.39E-01		G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
		569.26	3.645E-02	&	4.613E-01	1.32E-01	G
TH-234	1.1626E+00	63.29	7.987E-01	% (P	2.506E+00	7.54E-01	G K
		92.80	1.636E+00	(P	1.899E+00	5.83E-01	G
		92.38	1.173E-01	% P	2.314E+00	6.86E-01	G

AM-241 -5.3818E-02
 59.54-5.382E-02 % (P 3.494E-01 1.05E-01 G
 (- This peak used in the nuclide activity average.

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

Nuclide Codes:

T - Thermal Neutron Activation
 F - Fast Neutron Activation
 I - Fission Product
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 P - Photon Reaction
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 M - No MDA Calculation
 R - Coincidence Corrected
 H - Halflife limit exceeded

Peak Codes:

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

***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****						
		Time of Count	Time Corrected	Uncertainty	3 Sigma	
Nuclide		Activity	Activity	Counting	Total	MDA
		pCi/gm	pCi/gm	pCi/gm	pCi/gm	pCi/gm
BE-7	#A	1.5058E-01	1.5497E-01	4.2585E-01	4.2594E-01	4.627E-01
K-40		1.6174E+01	1.6174E+01	1.9442E+00	2.1482E+00	
MN-54	#A	-1.1447E-03	-1.1503E-03	1.7060E-01	1.7060E-01	5.215E-02
CO-57	#B	1.1227E-02	1.1291E-02	4.5741E-02	4.5745E-02	5.060E-02
CO-60	#B	9.1968E-03	9.2041E-03	4.8457E-02	4.8460E-02	5.752E-02

Sr-85	#A	-1.3906E-02	-1.4239E-02	5.4866E-02	5.4871E-02	6.033E-02
Kr-85	#A	-3.4937E+02	-3.4938E+02	1.4554E+03	1.4555E+03	1.398E+03
Y-88	#B	1.2421E-02	1.2601E-02	3.6056E-02	3.6063E-02	4.178E-02
NB-94	#B	-4.5605E-03	-4.5605E-03	4.9645E-02	4.9646E-02	5.325E-02
Ag-108M	#B	2.5040E-02	2.5041E-02	4.8807E-02	4.8828E-02	5.372E-02
CD-109	#A	5.9659E-01	5.9861E-01	1.4727E+00	1.4731E+00	1.620E+00
SN-113	#B	4.3589E-03	4.4174E-03	4.4716E-02	4.4717E-02	5.121E-02
SB-125	#B	9.1664E-02	9.1803E-02	1.0323E-01	1.0336E-01	1.647E-01
I-131	#B	-7.6589E-03	-9.2672E-03	5.2632E-02	5.2635E-02	4.945E-02
CS-134	#	3.1068E-02	3.1132E-02	1.9113E-02	1.9194E-02	9.132E-03
CS-137	#A	2.2267E-02	2.2270E-02	6.1763E-02	6.1776E-02	6.939E-02
CE-139	#A	-6.8444E-04	-6.9212E-04	7.3463E-02	7.3463E-02	5.056E-02
EU-152	#B	2.3623E-02	2.3631E-02	1.2907E-01	1.2908E-01	1.440E-01
EU-154	#B	3.2894E-02	3.2910E-02	1.0024E-01	1.0026E-01	1.111E-01
EU-155	#B	4.3233E-02	4.3270E-02	1.4691E-01	1.4693E-01	1.628E-01
HG-203	#B	3.4253E-02	3.5398E-02	4.5873E-02	4.5916E-02	4.790E-02
TL-208		3.6528E-01	3.6528E-01	1.0868E-01	1.1062E-01	
PB-212	#	9.2213E-01	9.2213E-01	1.4698E-01	1.5594E-01	1.194E-01
PB-214	#	4.8366E-01	4.8366E-01	1.2527E-01	1.2822E-01	1.258E-01
BI-212		8.1880E-01	8.1880E-01	5.4816E-01	5.5011E-01	
BI-214		5.7005E-01	5.7005E-01	1.6348E-01	1.6662E-01	
RA-224	#A	1.0315E+00	1.0315E+00	1.3442E+00	1.3455E+00	1.462E+00
RA-226	#	1.5302E+00	1.5302E+00	1.1906E+00	1.1937E+00	
AC-228		1.1338E+00	1.1338E+00	2.6898E-01	2.7651E-01	
TH-227	#B	-4.3328E-01	-4.3328E-01	5.5487E-01	5.5541E-01	5.988E-01
PA-234	#B	-1.0550E-01	-1.0550E-01	1.5703E-01	1.5714E-01	1.715E-01
TH-234	#B	1.1626E+00	1.1626E+00	1.2437E+00	1.2454E+00	2.506E+00
AM-241	#A	-5.3817E-02	-5.3818E-02	3.4084E-01	3.4085E-01	3.494E-01

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

----- S U M M A R Y -----
Total Activity (50.2 to 1999.1 keV) 2.0592245E+01 pCi/gm
Total Decayed Activity (50.2 to 1999.1 keV) 2.0592249E+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-13-01-003-F

Spectrum Filename: C:\GammaVision\Spectra\102F_19JUL2006_1910.An1

Acquisition information

Start time: 19-Jul-2006 19:10:27
Live time: 2000
Real time: 2021
Dead time: 1.03 %
Detector ID: 3

Detector system

Det 102 - DSPP-468

Calibration

Filename: D2_1LSa.Clb
DET 102 1 Liter Sand Geometry

Energy Calibration

Created: 15-Jan-2005 03:09:29
Zero offset: 0.220 keV
Gain: 0.500 keV/channel
Quadratic: -6.435E-08 keV/channel^2

Efficiency Calibration

Created: 15-Jan-2005 06:48:10
Type: Polynomial
Uncertainty: 0.497 %
Coefficients: -0.294180 -5.980622 0.744607
-0.096737 0.005214 -0.000120

Library Files

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

Analysis parameters

Analysis engine: Env32 G53W4.20
Start channel: 100 (50.22keV)
Stop channel: 4000 (1999.02keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 1.9870E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.9870E+03) =
5.0327E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	17-Jul-2006 10:45:00
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. 14 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.7618

***** S U M M A R Y O F P E A 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	139.	33.49	1.50	8.847E-03				
74.87	139.	33.49	1.50	8.847E-03	74.81	9.600	PBC<MDA	PB212
77.26	205.	23.31	1.50	9.541E-03	77.11	17.500	8.352E-01	PB212
					77.11	10.700	1.366E+00	PB214
77.26	205.	23.31	1.50	9.541E-03	77.11	17.500	PBC<MDA	PB212
					77.11	10.700	1.366E+00	PB214
86.80	71.	40.45	1.11	1.209E-02				
93.16	108.	27.61	1.11	1.341E-02	92.80	3.000	1.834E+00	TH234
186.46	83.	33.13	0.83	1.625E-02	185.99	3.280	PBC<MDA	RA226
209.91	73.	38.74	1.34	1.516E-02				
239.24	884.	5.73	1.20	1.378E-02	238.63	43.100	1.010E+00	PB212
271.16	76.	30.16	1.30	1.239E-02				
295.84	137.	13.28	1.26	1.145E-02	295.22	19.200	4.243E-01	PB214
301.11	38.	41.30	1.26	1.127E-02				
339.08	188.	11.67	1.31	1.004E-02	338.40	12.010	1.059E+00	AC228
352.70	272.	11.15	1.22	9.659E-03	351.99	37.100	5.144E-01	PB214
511.99	122.	14.52	1.33	6.679E-03	510.72	22.500	5.508E-01	TL208
584.37	253.	10.22	1.55	5.878E-03	583.14	86.000	3.389E-01	TL208
610.39	185.	11.85	1.48	5.640E-03	609.32	46.090	4.822E-01	BI214
796.41	26.	35.84	1.60	4.420E-03	795.76	85.400	PBC<MDA	CS134
912.82	136.	12.04	0.99	3.915E-03				
969.81	101.	18.06	1.75	3.715E-03	968.90	17.460	1.062E+00	AC228
1122.00	63.	22.86	1.11	3.279E-03				
1463.32	635.	3.97	2.22	2.617E-03	1460.75	10.700	1.540E+01	K40

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

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide	
173.19	86.87	380.	71.	0.036	121.36	1.107	BI-207	1D
185.76	93.23	422.	101.	0.050	91.32	1.111	U-235	D
419.44	209.91	313.	73.	0.036	116.23	1.339	NP-239	M

Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM	Suspected
478.10	239.24	1210.	142.	0.071	106.72	1.204	PB-212 M
541.96	271.16	186.	76.	0.038	90.48	1.302	AC-228 sM
601.87	300.81	102.	38.	0.019	123.90	1.259	PB-212 lD
1825.79	912.82	25.	147.	0.074	28.54	0.991	AC-228 sM
1939.82	969.81	120.	43.	0.022	117.07	1.754	AC-228 sM
2244.99	1122.00	33.	39.	0.020	78.30	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 Centroid Background Net Area Intensity Uncert FWHM
Channel Energy Counts Counts Cts/Sec 3 Sigma % keV

PB-212	149.32	74.87	1065.	139.	0.070	100.46	1.500s
PB-212	153.80	77.11	1040.	205.	0.103	69.94	1.500D
PB-214	153.80	77.11	1040.	205.	0.103	69.94	1.500D
TH-234	185.97	93.20	824.	140.	0.070	90.60	1.500
RA-226	372.45	186.42	458.	77.	0.039	115.31	1.500
PB-212	477.84	239.11	423.	685.	0.343	17.14	1.500
PB-214	591.34	295.84	190.	132.	0.066	51.30	1.500s
AC-228	677.55	338.94	111.	166.	0.083	35.56	1.500
PB-214	705.02	352.67	157.	227.	0.114	30.63	1.500
TL-208	1023.77	511.99	64.	122.	0.061	43.57	1.328s
TL-208	1168.58	584.37	110.	252.	0.126	30.67	1.553
BI-214	1220.64	610.39	86.	185.	0.092	35.54	1.480
CS-134	1592.83	796.41	31.	26.	0.013	107.52	1.601
AC-228	1941.66	970.72	58.	58.	0.029	67.83	1.718
K-40	2927.63	1463.36	6.	615.	0.308	12.20	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 - Average ----- Peak -----
Name Code Activity Energy Activity Code MDA Value
pCi/gm keV pCi/gm pCi/gm COMMENTS

BE-7 7.6039E-02
477.56 7.604E-02 %(3.927E-01 1.15E-01 G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
K-40	1.4917E+01	1460.75	1.492E+01	(P	3.309E-01	6.07E-01	G
MN-54	-9.0614E-04	834.81	-9.061E-04	%(P	4.947E-02	1.37E-02	G
CO-57	-2.2033E-04	122.07	-2.203E-04	%(	5.816E-02	1.73E-02	G K
		136.43	-2.835E-02	%	4.632E-01	1.38E-01	G
CO-60	-1.7071E-02	1332.51	-1.707E-02	&(P	6.435E-02	1.86E-02	G K
		1173.23	1.384E-02	&	6.433E-02	1.86E-02	G K
Sr-85	-1.0117E-02	514.00	-1.012E-02	%(	5.843E-02	1.72E-02	G
Kr-85	-2.2770E+02	513.99	-2.277E+02	%(	1.315E+03	3.87E+02	G
Y-88	-2.2720E-03	1836.01	-2.272E-03	%(P	4.644E-02	1.17E-02	G K
		898.02	2.114E-02	% P	5.076E-02	1.52E-02	G
NB-94	-5.0408E-03	871.10	-5.041E-03	%(	5.211E-02	1.47E-02	G K
		702.50	8.033E-04	&	4.655E-02	1.30E-02	G K
Ag-108M	-8.9223E-03	722.95	-8.922E-03	%(	5.792E-02	1.67E-02	G K
		614.37	-3.860E-02	% P	6.699E-02	2.05E-02	G
		433.93	1.198E-02	%	4.121E-02	1.22E-02	G
CD-109	7.7729E-02	88.04	7.773E-02	&(P	2.145E+00	6.39E-01	G
SN-113	-1.5969E-02	391.71	-1.597E-02	&(	6.821E-02	2.02E-02	G K
		255.04	-2.937E-01	%	1.997E+00	5.91E-01	G
SB-125	-2.8869E-03	427.95	-2.887E-03	%(P	1.504E-01	4.31E-02	G K
		600.77	-2.483E-02	% P	2.610E-01	7.49E-02	G
		636.15	-7.672E-04	% P	4.855E-01	1.38E-01	G
		463.51	2.986E-01	% P	4.521E-01	1.39E-01	G
		176.29	8.298E-02	% P	6.631E-01	1.97E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
I-131	-1.8498E-02	364.48-1.850E-02	% (	6.162E-02	1.84E-02	G K	
		636.97-1.585E-01	%	7.854E-01	2.28E-01	G	
		284.29-2.196E-03	&	5.968E-01	1.72E-01	G	
CS-134	2.6846E-02	604.66 9.197E-03	& (	4.784E-02	1.39E-02	G K	
		795.76 4.702E-02	(	5.138E-02	1.69E-02	G	
		569.29-1.305E-02	%	2.890E-01	8.23E-02	G	
		801.84 2.602E-03	& P	5.477E-01	1.52E-01	G	
CS-137	8.9390E-03	661.62 8.939E-03	% (	5.346E-02	1.54E-02	G	
CE-139	6.1879E-04	165.85 6.188E-04	& (P	5.660E-02	1.68E-02	G	
EU-152	-7.5573E-03	121.78-7.557E-03	% (P	1.596E-01	4.74E-02	G K	
		344.30-5.232E-02	%	1.486E-01	4.45E-02	G	
		1408.08-5.033E-02	%	2.934E-01	8.30E-02	G	
		964.00-8.291E-02	% P	4.647E-01	1.34E-01	G	
		1112.07 1.127E-01	%	5.487E-01	1.60E-01	G	
		778.90 8.417E-02	% P	4.127E-01	1.20E-01	G	
EU-154	-1.2650E-03	123.10-1.265E-03	% (P	1.278E-01	3.80E-02	G K	
		1274.80-5.838E-02	%	2.647E-01	7.75E-02	G	
		723.30-4.571E-02	% P	2.671E-01	7.71E-02	G	
		1004.80-6.464E-02	&	3.688E-01	1.06E-01	G	
EU-155	1.7164E-02	86.45 1.716E-02	& (P	2.214E-01	6.59E-02	G K	
		105.31-2.649E-02	%	2.441E-01	7.28E-02	G	
HG-203	3.2487E-02	279.17 3.249E-02	& (P	4.509E-02	1.40E-02	G K	
		72.87-2.456E-01	%	2.206E+00	6.61E-01	G	
		70.83-4.860E-01	&	4.052E+00	1.21E+00	G	
		82.50-6.169E-01	%	4.075E+00	1.22E+00	G	
TL-208	3.3887E-01	583.14 3.389E-01	(P	6.914E-02	3.48E-02	G	
		510.72 5.508E-01	+	1.806E-01	8.02E-02	G	

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
PB-212	7.9809E-01	238.63	7.830E-01	(	1.127E-01	4.47E-02	G K
		77.11	8.352E-01	@(	6.232E-01	1.95E-01	G
		74.81	1.114E+00	+ P	1.240E+00	3.81E-01	G
							Energy duplication
PB-214	4.2325E-01	351.99	4.306E-01	(P	1.156E-01	4.40E-02	G K
		295.22	4.091E-01	*(	2.069E-01	7.00E-02	G
		77.11	1.366E+00	+	1.019E+00	3.18E-01	G
		241.92	2.790E-01	%	7.310E-01	2.21E-01	G
							Energy duplication
BI-212	1.3265E-02	727.17	1.326E-02	%(	4.871E-01	1.39E-01	G K
		1620.56	2.539E-01	% P	1.759E+00	4.66E-01	G
		785.42	1.028E+00	% P	2.314E+00	6.98E-01	G
BI-214	4.8217E-01	609.32	4.822E-01	(	1.202E-01	5.72E-02	G K
		1764.51	1.664E-03	% P	4.328E-01	1.15E-01	G
		1120.28	6.328E-02	%	5.410E-01	1.56E-01	G
RA-224	7.0739E-01	241.00	7.074E-01	%(P	1.357E+00	4.12E-01	G
RA-226	9.8620E-01	185.99	9.862E-01	(P	1.306E+00	4.01E-01	G
AC-228	3.2574E-01	911.07	9.770E-02	%(P	2.465E-01	7.38E-02	G K
		968.90	6.104E-01	(P	3.995E-01	1.38E-01	G
		338.40	9.343E-01	(	2.910E-01	1.11E-01	G
TH-227	-3.1596E-01	236.00	3.160E-01	%(P	5.415E-01	1.65E-01	G K
		256.25	1.305E-03	&	5.652E-01	1.65E-01	G
PA-234	-2.9936E-02	98.44	2.994E-02	&(	2.468E-01	7.37E-02	G K
		946.00	0.000E+00	%	3.728E-01	1.06E-01	G
		131.28	9.581E-03	%	2.117E-01	6.28E-02	G
		94.67	4.005E-03	&	4.408E-01	1.31E-01	G
		883.24	0.000E+00	&	5.052E-01	1.42E-01	G
		926.70	1.774E-03	&	4.925E-01	1.36E-01	G
		569.26	2.291E-02	%	4.381E-01	1.25E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TH-234	2.1269E+00	63.29	1.932E+00	%(P	4.583E+00	1.39E+00	G K
		92.80	2.381E+00	(	2.320E+00	7.19E-01	G
		92.38	1.541E+00	% P	2.924E+00	8.88E-01	G

AM-241	-4.6377E-03	59.54	4.638E-03	%(	6.566E-01	1.95E-01	G
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(- This peak used in the nuclide activity average.

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

Nuclide Codes:

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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 *****						
Time of Count		Time Corrected		Uncertainty		3 Sigma
Nuclide	Activity	Activity	Activity	Counting	Total	MDA
	pCi/gm	pCi/gm	pCi/gm	pCi/gm	pCi/gm	pCi/gm
BE-7 #A	7.3753E-02	7.6039E-02	3.4367E-01	3.4369E-01	3.809E-01	
K-40	1.4917E+01	1.4917E+01	1.8203E+00	2.0036E+00	3.309E-01	
MN-54 #A	-9.0142E-04	-9.0614E-04	9.1364E-02	9.1364E-02	4.921E-02	
CO-57 #B	-2.1900E-04	-2.2033E-04	5.1785E-02	5.1785E-02	5.781E-02	
CO-60 #B	-1.7057E-02	-1.7071E-02	5.7186E-02	5.7195E-02	6.430E-02	
Sr-85 #A	-9.8658E-03	-1.0117E-02	5.1536E-02	5.1539E-02	5.698E-02	

Kr-85	#A	-2.2770E+02	-2.2770E+02	1.1602E+03	1.1603E+03	1.315E+03
Y-88	#B	-2.2375E-03	-2.2720E-03	3.5885E-02	3.5885E-02	4.573E-02
NB-94	#B	-5.0408E-03	-5.0408E-03	4.4196E-02	4.4197E-02	5.211E-02
Ag-108M	#B	-8.9220E-03	-8.9223E-03	5.0147E-02	5.0149E-02	5.791E-02
CD-109	#A	7.7450E-02	7.7729E-02	1.9184E+00	1.9184E+00	2.137E+00
SN-113	#B	-1.5744E-02	-1.5969E-02	6.0537E-02	6.0544E-02	6.725E-02
SB-125	#B	-2.8822E-03	-2.8869E-03	2.5840E-01	2.5840E-01	1.501E-01
I-131	#B	-1.5104E-02	-1.8498E-02	5.5078E-02	5.5088E-02	5.031E-02
CS-134	#B	2.6788E-02	2.6846E-02	2.8864E-02	2.8904E-02	4.774E-02
CS-137	#A	8.9377E-03	8.9390E-03	4.6233E-02	4.6236E-02	5.345E-02
CE-139	#A	6.1150E-04	6.1879E-04	5.0299E-02	5.0299E-02	5.593E-02
EU-152	#B	-7.5547E-03	-7.5573E-03	1.9646E-01	1.9646E-01	1.596E-01
EU-154	#B	-1.2643E-03	-1.2650E-03	1.5790E-01	1.5790E-01	1.277E-01
EU-155	#B	1.7148E-02	1.7164E-02	1.9768E-01	1.9768E-01	2.212E-01
HG-203	#B	3.1370E-02	3.2487E-02	4.1863E-02	4.1903E-02	4.354E-02
TL-208		3.3887E-01	3.3887E-01	1.0409E-01	1.0581E-01	
PB-212	#	7.9809E-01	7.9809E-01	1.3679E-01	1.4394E-01	1.127E-01
PB-214	#	4.2325E-01	4.2325E-01	1.2650E-01	1.2871E-01	1.156E-01
BI-212	#B	1.3265E-02	1.3265E-02	4.1556E-01	4.1556E-01	4.871E-01
BI-214		4.8217E-01	4.8217E-01	1.7138E-01	1.7351E-01	
RA-224	#A	7.0739E-01	7.0739E-01	1.2368E+00	1.2374E+00	1.357E+00
RA-226	#A	9.8620E-01	9.8620E-01	1.2027E+00	1.2040E+00	1.306E+00
AC-228	F	3.2574E-01	3.2574E-01	1.1582E-01	1.1725E-01	2.465E-01
TH-227	#B	-3.1596E-01	-3.1596E-01	4.9870E-01	4.9901E-01	5.415E-01
PA-234	#B	-2.9936E-02	-2.9936E-02	2.2116E-01	2.2116E-01	2.468E-01
TH-234	#B	2.1269E+00	2.1269E+00	1.9269E+00	1.9305E+00	4.583E+00
AM-241	#A	-4.6377E-03	-4.6377E-03	5.8464E-01	5.8464E-01	6.566E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
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) 1.6064016E+01 pCi/gm
Total Decayed Activity (1460.5 to 1999.0 keV) 1.6064016E+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-13-01-003-F-RC

Spectrum Filename: C:\GammaVision\Spectra\102F_19JUL2006_1947.An1

Acquisition information

Start time: 19-Jul-2006 19:47:14
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: 1.9870E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.9870E+03) =
5.0327E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	17-Jul-2006 10:45:00
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. 13 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.6028

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

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
77.35	175.	26.77	1.50	9.541E-03	77.11	10.700	1.164E+00	PB214
					77.11	17.500	7.119E-01	PB212
77.35	175.	26.77	1.50	9.541E-03	77.11	10.700	1.164E+00	PB214
					77.11	17.500	7.119E-01	PB212
92.66	148.	29.56	1.74	1.330E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	2.520E+00	TH234
186.34	102.	29.66	1.00	1.625E-02	185.99	3.280	PBC<MDA	RA226
239.12	711.	4.44	1.22	1.378E-02	238.63	43.100	8.128E-01	PB212
242.64	107.	19.91	1.22	1.362E-02	241.00	3.900	1.346E+00	RA224
					241.92	7.470	7.128E-01	PB214
270.79	75.	32.52	0.97	1.241E-02				
295.79	161.	11.83	1.26	1.144E-02	295.22	19.200	4.980E-01	PB214
300.80	45.	35.73	1.26	1.126E-02				
339.01	168.	12.27	1.47	1.004E-02	338.40	12.010	9.434E-01	AC228
352.73	231.	9.34	1.08	9.659E-03	351.99	37.100	4.360E-01	PB214
429.29	29.	30.55	0.65	7.947E-03				
463.77	71.	30.26	1.09	7.361E-03	463.51	10.000	6.396E-01	SB125
511.52	110.	15.49	1.62	6.685E-03	510.72	22.500	4.953E-01	TL208
584.38	212.	10.62	1.44	5.878E-03	583.14	86.000	2.836E-01	TL208
610.38	187.	11.31	1.75	5.640E-03	609.32	46.090	4.879E-01	BI214
662.62	51.	35.28	1.33	5.222E-03	661.62	84.620	7.901E-02	CS137
728.47	48.	28.41	1.49	4.786E-03	727.17	11.800	5.771E-01	BI212
796.46	46.	27.17	0.93	4.416E-03	795.76	85.400	8.307E-02	CS134
912.70	152.	11.40	1.67	3.916E-03	911.07	29.000	9.063E-01	AC228
969.72	104.	18.93	1.36	3.715E-03	968.90	17.460	1.087E+00	AC228
1463.32	617.	4.10	1.86	2.617E-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	Centroid	Background	Net Area	Intensity	Uncert	FWHM	Suspected		
Channel	Energy	Counts	Counts	Cts/Sec	3 Sigma %	keV	Nuclide		
372.29	186.34	342.	102.	0.051	88.97	0.998	PA-234	l	
477.88	239.11	144.	711.	0.356	13.33	1.215	PB-212	D	
484.90	242.62	173.	107.	0.053	59.74	1.218	XE-138	D	
541.22	270.79	200.	75.	0.038	97.57	0.968	AC-228	M	
601.25	300.84	106.	45.	0.022	107.20	1.259	PB-212	1D	
2927.54	1463.32	158.	465.	0.232	18.03	1.861	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	Centroid	Background	Net Area	Intensity	Uncert	FWHM		
	Channel	Energy	Counts	Counts	Cts/Sec	3 Sigma %	keV		
PB-214	153.80	77.11	1008.	175.	0.087	80.32	1.500D		
PB-212	153.80	77.11	1008.	175.	0.087	80.32	1.500D		
TH-234	185.80	93.11	949.	114.	0.057	117.89	1.500s		
PB-212	477.90	239.13	465.	629.	0.314	18.83	1.500		
RA-224	484.26	242.31	465.	77.	0.038	122.03	1.500s		
PB-214	591.27	295.81	159.	175.	0.088	38.01	1.500		
AC-228	677.70	339.01	125.	178.	0.089	34.82	1.500		
PB-214	705.10	352.71	118.	231.	0.115	28.07	1.500		
SB-125	927.23	463.74	93.	42.	0.021	102.85	1.500		
TL-208	1022.82	511.52	66.	110.	0.055	46.47	1.617s		
TL-208	1168.60	584.38	87.	211.	0.106	31.87	1.443		
BI-214	1220.61	610.38	70.	187.	0.093	33.94	1.753s		
CS-137	1325.78	662.94	61.	32.	0.016	115.88	1.509s		
BI-212	1457.63	728.84	45.	32.	0.016	103.81	1.554		
CS-134	1593.00	796.49	29.	39.	0.020	75.30	1.601s		
AC-228	1825.78	912.82	60.	117.	0.059	39.25	1.679		
AC-228	1941.30	970.54	41.	71.	0.036	52.16	1.718		
K-40	2929.84	1464.46	35.	152.	0.076	29.28	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 -		Average	----- Peak -----						
Name	Code	Activity pCi/gm	Energy keV	Activity pCi/gm	Code	MDA Value pCi/gm	COMMENTS		
BE-7		1.3032E-01	477.56	1.303E-01	% (	3.829E-01 1.14E-01	G		
K-40		3.6958E+00	1460.75	3.696E+00	(P	7.318E-01 3.61E-01	G		
MN-54		-1.2774E-05	834.81	-1.277E-05	& (P	5.099E-02 1.41E-02	G		
CO-57		-1.0694E-02	122.07	-1.069E-02	& (	5.466E-02 1.64E-02	G K		
			136.43	1.556E-01	%	4.260E-01 1.29E-01	G		
CO-60		-1.8686E-04	1332.51	-1.869E-04	% (P	6.029E-02 1.63E-02	G K		
			1173.23	3.066E-03	&	8.434E-02 2.40E-02	G K		
Sr-85		-2.2491E-02	514.00	-2.249E-02	% (	6.462E-02 1.94E-02	G		
Kr-85		-5.0619E+02	513.99	-5.062E+02	% (	1.454E+03 4.36E+02	G		
Y-88		-2.1236E-05	1836.01	-2.124E-05	% (P	5.445E-02 1.39E-02	G K		
			898.02	-8.848E-04	& P	5.143E-02 1.40E-02	G		
NB-94		1.7616E-02	871.10	1.762E-02	% (	4.578E-02 1.36E-02	G K		
			702.50	1.444E-02	&	4.386E-02 1.30E-02	G K		
Ag-108M		0.0000E+00	722.95	0.000E+00	% (	5.791E-02 1.63E-02	G K		
			614.37	2.767E-03	% P	7.228E-02 2.09E-02	G		
			433.93	-6.301E-03	%	4.770E-02 1.39E-02	G		
CD-109		-1.9648E-01	88.04	-1.965E-01	% (P	2.362E+00 7.06E-01	G		
SN-113		-1.3243E-02	391.71	-1.324E-02	% (	6.541E-02 1.93E-02	G K		
			255.04	1.451E-01	%	1.882E+00 5.53E-01	G		

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	5.1596E-02	427.95	6.310E-02	% (P	1.505E-01	4.51E-02	G K
		600.77	4.411E-03	& P	2.174E-01	6.08E-02	G
		636.15	3.573E-02	% P	4.852E-01	1.39E-01	G
		463.51	3.911E-01	(P	4.397E-01	1.39E-01	G
		176.29	3.836E-03	& P	5.972E-01	1.76E-01	G
I-131	8.9574E-03	364.48	8.957E-03	% (	5.739E-02	1.68E-02	G K
		636.97	6.098E-02	%	8.676E-01	2.48E-01	G
		284.29	1.172E-05	&	7.801E-01	2.27E-01	G
CS-134	3.0349E-02	604.66	4.819E-03	% (	4.400E-02	1.26E-02	G K
		795.76	7.054E-02	(	4.985E-02	1.77E-02	G
		569.29	7.646E-02	%	3.320E-01	9.76E-02	G
		801.84	1.079E-01	& P	6.058E-01	1.75E-01	G
CS-137	4.9484E-02	661.62	4.948E-02	(	6.021E-02	1.91E-02	G
CE-139	-5.8588E-03	165.85	5.859E-03	% (P	5.432E-02	1.61E-02	G
EU-152	-2.0224E-02	121.78	2.022E-02	& (P	1.565E-01	4.66E-02	G K
		344.30	1.640E-02	%	1.141E-01	3.32E-02	G
		1408.08	4.392E-02	%	2.668E-01	7.48E-02	G
		964.00	6.497E-02	% P	4.546E-01	1.30E-01	G
		1112.07	4.354E-02	%	5.173E-01	1.47E-01	G
		778.90	9.395E-02	% P	4.594E-01	1.34E-01	G
EU-154	3.0242E-02	123.10	3.024E-02	& (P	1.064E-01	3.19E-02	G K
		1274.80	7.743E-02	%	1.937E-01	5.80E-02	G
		723.30	4.312E-02	% P	2.274E-01	6.53E-02	G
		1004.80	3.453E-03	%	2.932E-01	8.04E-02	G
EU-155	-4.5062E-03	86.45	4.506E-03	& (P	2.661E-01	7.92E-02	G K
		105.31	3.169E-02	%	2.645E-01	7.90E-02	G
HG-203	-4.3391E-03	279.17	4.339E-03	& (P	5.447E-02	1.60E-02	G K
		72.87	7.612E-01	&	2.017E+00	6.10E-01	G
		70.83	1.128E-01	%	4.502E+00	1.35E+00	G
		82.50	1.236E+00	%	4.011E+00	1.21E+00	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	2.8356E-01	583.14	2.836E-01	(P	6.193E-02	3.02E-02	G
		510.72	4.953E-01	+	1.835E-01	7.68E-02	G
PB-212	7.1682E-01	238.63	7.188E-01	(	1.179E-01	4.51E-02	G K
		77.11	7.119E-01	*(	6.136E-01	1.91E-01	G
		74.81	7.433E-01	& P	1.252E+00	3.81E-01	G
PB-214	4.7228E-01	351.99	4.367E-01	(P	1.012E-01	4.09E-02	G K
		295.22	5.410E-01	(	1.897E-01	6.86E-02	G
		77.11	1.164E+00	+	1.003E+00	3.12E-01	G
		241.92	4.826E-01	%	7.246E-01	2.22E-01	G
BI-212	3.8362E-01	727.17	3.836E-01	(	4.084E-01	1.33E-01	G K
		1620.56	5.490E-01	% P	2.209E+00	6.23E-01	G
		785.42	3.229E-02	% P	2.703E+00	7.59E-01	G
BI-214	4.8792E-01	609.32	4.879E-01	@(	1.091E-01	5.53E-02	G K
		1764.51	4.465E-03	% P	3.519E-01	9.13E-02	G
		1120.28	2.715E-01	&	5.314E-01	1.62E-01	G
RA-224	9.7757E-01	241.00	9.776E-01	&(P	1.314E+00	4.04E-01	G
RA-226	8.5870E-01	185.99	8.587E-01	%(P	1.289E+00	3.94E-01	G
AC-228	7.1928E-01	911.07	7.019E-01	(P	2.317E-01	9.20E-02	G K
		968.90	7.482E-01	(P	3.428E-01	1.30E-01	G
		338.40	1.005E+00	+	3.089E-01	1.17E-01	G
TH-227	1.2680E-02	236.00	1.268E-02	&(P	6.227E-01	1.86E-01	G K
		256.25	3.832E-02	&	6.060E-01	1.78E-01	G
PA-234	-2.0972E-02	98.44	2.097E-02	&(	2.397E-01	7.15E-02	G K
		946.00	1.526E-02	%	2.741E-01	7.67E-02	G
		131.28	3.515E-03	%	2.461E-01	7.31E-02	G
		94.67	1.603E-01	%	4.865E-01	1.47E-01	G
		883.24	1.178E-02	%	3.484E-01	9.51E-02	G
		926.70	2.944E-03	%	4.582E-01	1.26E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
		569.26	1.136E-01	%	4.915E-01	1.45E-01	G
TH-234	1.1769E+00						
		63.29	5.892E-01	%(P	4.631E+00	1.38E+00	G K
		92.80	1.941E+00	*(	2.487E+00	7.63E-01	G
		92.38	1.907E-02	% P	2.975E+00	8.86E-01	G

AM-241 9.3558E-02
59.54 9.356E-02 &(6.837E-01 2.04E-01 G
(- This peak used in the nuclide activity average.

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

Nuclide Codes:

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 *****						
Time of Count		Time Corrected		Uncertainty		3 Sigma
Nuclide	Activity	Activity	Activity	Counting	Total	MDA
	pCi/gm	pCi/gm	pCi/gm	pCi/gm	pCi/gm	pCi/gm
BE-7 #A	1.2636E-01	1.3032E-01	3.4183E-01	3.4191E-01	3.712E-01	
K-40	3.6958E+00	3.6958E+00	1.0833E+00	1.1030E+00	7.318E-01	
MN-54 #A	-1.2707E-05	-1.2774E-05	4.5640E-02	4.5640E-02	5.072E-02	
CO-57 #B	-1.0629E-02	-1.0694E-02	4.9057E-02	4.9061E-02	5.432E-02	
CO-60 #B	-1.8670E-04	-1.8686E-04	7.6041E-03	7.6041E-03	6.024E-02	

Sr-85	#A	-2.1927E-02	-2.2491E-02	5.8096E-02	5.8110E-02	6.300E-02
Kr-85	#A	-5.0618E+02	-5.0619E+02	1.3076E+03	1.3079E+03	1.454E+03
Y-88	#B	-2.0910E-05	-2.1236E-05	5.4573E-04	5.4573E-04	5.362E-02
NB-94	#B	1.7616E-02	1.7616E-02	4.0934E-02	4.0946E-02	4.578E-02
Ag-108M	#B	0.0000E+00	0.0000E+00	4.8872E-02	4.8872E-02	5.790E-02
CD-109	#A	-1.9577E-01	-1.9648E-01	2.6433E+00	2.6433E+00	2.353E+00
SN-113	#B	-1.3055E-02	-1.3243E-02	5.7792E-02	5.7797E-02	6.448E-02
SB-125	#B	5.1512E-02	5.1596E-02	5.5009E-02	5.5085E-02	1.502E-01
I-131	#B	7.2979E-03	8.9574E-03	5.0425E-02	5.0427E-02	4.676E-02
CS-134	#B	3.0283E-02	3.0349E-02	2.2853E-02	2.2916E-02	4.390E-02
CS-137	#A	4.9476E-02	4.9484E-02	5.7341E-02	5.7408E-02	6.020E-02
CE-139	#A	-5.7890E-03	-5.8588E-03	5.2247E-02	5.2248E-02	5.367E-02
EU-152	#B	-2.0216E-02	-2.0224E-02	1.5763E-01	1.5763E-01	1.564E-01
EU-154	#B	3.0226E-02	3.0242E-02	9.5827E-02	9.5841E-02	1.063E-01
EU-155	#B	-4.5021E-03	-4.5062E-03	1.2510E+00	1.2510E+00	2.658E-01
HG-203	#B	-4.1884E-03	-4.3391E-03	4.9595E-02	4.9595E-02	5.258E-02
TL-208		2.8356E-01	2.8356E-01	9.0548E-02	9.1936E-02	
PB-212	#	7.1682E-01	7.1682E-01	1.3501E-01	1.4087E-01	1.179E-01
PB-214	#	4.7228E-01	4.7228E-01	1.1166E-01	1.1476E-01	1.012E-01
BI-212	A	3.8362E-01	3.8362E-01	3.9823E-01	3.9881E-01	4.084E-01
BI-214	#	4.8792E-01	4.8792E-01	1.6559E-01	1.6783E-01	
RA-224	#A	9.7757E-01	9.7757E-01	1.2109E+00	1.2121E+00	1.314E+00
RA-226	#A	8.5870E-01	8.5870E-01	1.1814E+00	1.1824E+00	1.289E+00
AC-228		7.1928E-01	7.1928E-01	2.3500E-01	2.3844E-01	2.317E-01
TH-227	#B	1.2680E-02	1.2680E-02	5.5657E-01	5.5657E-01	6.227E-01
PA-234	#B	-2.0972E-02	-2.0972E-02	2.1439E-01	2.1439E-01	2.397E-01
TH-234	#B	1.1769E+00	1.1769E+00	1.3874E+00	1.3889E+00	4.631E+00
AM-241	#A	9.3557E-02	9.3558E-02	6.1288E-01	6.1290E-01	6.837E-01

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

----- S U M M A R Y -----
 Total Activity (270.7 to 1999.0 keV) 5.5702000E+00 pCi/gm
 Total Decayed Activity (270.7 to 1999.0 keV) 5.5702000E+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-13-01-015-F

Spectrum Filename: C:\GammaVision\Spectra\102F_19JUL2006_2024.An1

Acquisition information

Start time: 19-Jul-2006 20:24:45
Live time: 2000
Real time: 2019
Dead time: 0.93 %
Detector ID: 3

Detector system

Det 102 - DSPP-468

Calibration

Filename: D2_1LSa.Clb
DET 102 1 Liter Sand Geometry

Energy Calibration

Created: 15-Jan-2005 03:09:29
Zero offset: 0.220 keV
Gain: 0.500 keV/channel
Quadratic: $-6.435\text{E-}08 \text{ keV/channel}^2$

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: 1.6680E+03
Activity scaling factor: $1.0000\text{E}+06 / (1.0000\text{E}+00 * 1.6680\text{E}+03) = 5.9952\text{E}+02$
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	17-Jul-2006 11:15:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	102_150K_28APR05.Pbc 01-May-2005 05:27:47
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 13 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.8712

***** S U M M A R Y O F P E A K S I N R A N G E *****								
Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
77.27	155.	27.01	1.50	9.541E-03	77.11	10.700	1.229E+00	PB214
					77.11	17.500	7.516E-01	PB212
77.27	155.	27.01	1.50	9.541E-03	77.11	10.700	1.229E+00	PB214
					77.11	17.500	7.516E-01	PB212
187.10	98.	30.06	1.11	1.622E-02	185.99	3.280	1.420E+00	RA226
239.09	543.	5.10	1.22	1.378E-02	238.63	43.100	7.399E-01	PB212
242.17	89.	21.41	1.22	1.364E-02	241.00	3.900	1.339E+00	RA224
					241.92	7.470	7.103E-01	PB214
270.73	38.	41.61	1.32	1.241E-02				
295.66	159.	12.95	1.14	1.145E-02	295.22	19.200	5.863E-01	PB214
327.49	57.	32.63	1.41	1.039E-02				
339.07	140.	18.33	1.58	1.004E-02	338.40	12.010	9.415E-01	AC228
352.65	255.	8.85	1.06	9.661E-03	351.99	37.100	5.736E-01	PB214
463.92	33.	37.61	1.50	7.365E-03	463.51	10.000	PBC<MDA	SB125
511.78	79.	22.78	2.08	6.681E-03	510.72	22.500	4.249E-01	TL208
584.36	168.	10.36	1.44	5.878E-03	583.14	86.000	2.687E-01	TL208
610.41	147.	11.92	1.23	5.640E-03	609.32	46.090	4.586E-01	BI214
728.20	42.	30.67	1.04	4.788E-03				
912.89	122.	14.34	1.23	3.915E-03				
966.10	35.	23.30	1.71	3.734E-03	964.00	14.580	5.274E-01	EU152
970.24	109.	14.93	2.24	3.713E-03	968.90	17.460	1.360E+00	AC228
1122.38	48.	23.94	1.19	3.278E-03	1120.28	15.040	7.876E-01	BI214
1463.30	510.	4.52	2.10	2.617E-03	1460.75	10.700	1.474E+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	
477.81	239.07	112.	543.	0.272	15.30	1.215	PB-212	D

Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM	Suspected
483.97	242.15	139.	89.	0.045	64.24	1.217	PB-214 D
541.11	270.73	106.	38.	0.019	124.83	1.315	AC-228 M
654.66	327.49	105.	57.	0.028	97.90	1.411	AC-228 sM
1456.35	728.20	51.	31.	0.015	112.58	1.036	J-132 sM
1825.93	912.89	45.	120.	0.060	36.34	1.231	AC-228 M
1940.69	970.24	28.	120.	0.060	33.21	2.244	AC-228 sM
2245.45	1122.38	17.	47.	0.023	57.50	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	Centroid	Background	Net Area	Intensity	Uncert	FWHM
	Channel	Energy	Counts	Counts	Cts/Sec	3 Sigma	% keV
PB-214	153.80	77.11	798.	155.	0.077	81.04	1.500D
PB-212	153.80	77.11	798.	155.	0.077	81.04	1.500D
RA-226	372.30	186.34	360.	70.	0.035	112.89	1.500
PB-212	477.89	239.13	323.	425.	0.212	23.11	1.500s
RA-224	483.08	241.73	309.	85.	0.043	91.99	1.500s
PB-214	483.16	241.76	303.	85.	0.042	93.19	1.500s
PB-214	591.26	295.80	129.	168.	0.084	36.94	1.500
AC-228	677.80	339.06	119.	123.	0.062	46.30	1.500
PB-214	704.86	352.59	83.	221.	0.110	26.68	1.500s
SB-125	927.59	463.92	67.	33.	0.016	112.83	1.500s
TL-208	1023.34	511.78	72.	79.	0.040	68.33	2.085s
TL-208	1168.55	584.36	49.	168.	0.084	31.09	1.436
BI-214	1220.67	610.41	58.	147.	0.074	35.76	1.234s
EU-152	1932.41	966.10	17.	35.	0.018	69.90	1.714
BI-214	2240.95	1120.28	26.	40.	0.020	71.07	1.819D
K-40	2927.49	1463.29	1.	491.	0.246	13.55	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 -		Average	----- Peak -----				
Name	Code	Activity pCi/gm	Energy keV	Activity pCi/gm	Code	MDA Value pCi/gm	COMMENTS
BE-7		1.4454E-01	477.56	1.445E-01	&(	3.582E-01 1.07E-01	G
K-40		1.4192E+01	1460.75	1.419E+01	(P	2.129E-01 6.41E-01	G
MN-54		1.4656E-02	834.81	1.466E-02	&(P	4.310E-02 1.26E-02	G
CO-57		2.9731E-03	122.07	2.973E-03	&(	6.141E-02 1.82E-02	G K
			136.43	5.846E-02	%	4.875E-01 1.45E-01	G
CO-60		-4.8476E-04	1332.51	4.848E-04	%(P	6.780E-02 1.82E-02	G K
			1173.23	2.337E-02	&	8.829E-02 2.59E-02	G K
Sr-85		-1.7034E-02	514.00	1.703E-02	&(	6.057E-02 1.80E-02	G
Kr-85		-3.8334E+02	513.99	3.833E+02	&(	1.363E+03 4.04E+02	G
Y-88		-5.5435E-03	1836.01	5.544E-03	%(P	5.016E-02 1.29E-02	G K
			898.02	6.934E-05	& P	5.751E-02 1.55E-02	G
NB-94		2.8707E-02	871.10	2.871E-02	%(	5.777E-02 1.76E-02	G K
			702.50	1.571E-03	&	5.366E-02 1.50E-02	G K
Ag-108M		-7.9257E-03	722.95	7.926E-03	%(	5.432E-02 1.54E-02	G K
			614.37	3.486E-02	& P	8.449E-02 2.54E-02	G
			433.93	1.284E-02	&	3.774E-02 1.12E-02	G
CD-109		-1.0638E-01	88.04	1.064E-01	%(P	1.714E+00 5.06E-01	G
SN-113		8.6865E-03	391.71	8.687E-03	%(	6.609E-02 1.92E-02	G K
			255.04	9.285E-02	%	2.011E+00 5.88E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	7.0507E-02	427.95	2.709E-02	% (P	1.420E-01	4.10E-02	G K
		600.77	3.854E-02	% P	2.528E-01	7.23E-02	G
		636.15	8.973E-02	% P	4.745E-01	1.37E-01	G
		463.51	3.594E-01	* (P	4.502E-01	1.42E-01	G
		176.29	2.020E-01	% P	7.192E-01	2.15E-01	G
I-131	-4.7078E-03	364.48	4.708E-03	% (	6.841E-02	1.98E-02	G K
		636.97	7.691E-02	%	8.057E-01	2.28E-01	G
		284.29	1.343E-01	%	8.509E-01	2.51E-01	G
CS-134	1.0860E-02	604.66	1.086E-02	& (	4.612E-02	1.34E-02	G K
		795.76	4.088E-02	%	6.638E-02	2.06E-02	G
		569.29	4.142E-02	%	3.114E-01	8.94E-02	G
		801.84	1.365E-01	% P	7.151E-01	2.07E-01	G
CS-137	-8.4604E-03	661.62	8.460E-03	% (	5.849E-02	1.67E-02	G
CE-139	-2.6607E-03	165.85	2.661E-03	% (P	5.603E-02	1.65E-02	G
EU-152	1.8710E-01	121.78	1.740E-02	& (P	1.571E-01	4.66E-02	G K
		344.30	5.871E-02	&	1.659E-01	4.97E-02	G
		1408.08	5.053E-02	&	3.300E-01	9.25E-02	G
		964.00	5.274E-01	(P	3.257E-01	1.24E-01	G
		1112.07	7.696E-02	&	4.897E-01	1.39E-01	G
		778.90	5.972E-02	% P	4.025E-01	1.14E-01	G
EU-154	1.0514E-02	123.10	1.051E-02	% (P	1.232E-01	3.66E-02	G K
		1274.80	6.232E-03	&	2.378E-01	6.61E-02	G
		723.30	3.317E-02	% P	2.502E-01	7.06E-02	G
		1004.80	3.359E-02	%	4.025E-01	1.14E-01	G
EU-155	6.8364E-02	86.45	6.836E-02	% (P	2.766E-01	8.30E-02	G K
		105.31	1.143E-01	&	2.403E-01	7.29E-02	G
HG-203	-2.8038E-03	279.17	2.804E-03	& (P	5.921E-02	1.73E-02	G K
		72.87	6.481E-01	&	2.338E+00	7.04E-01	G
		70.83	1.812E-01	&	3.946E+00	1.17E+00	G
		82.50	1.385E+00	%	4.492E+00	1.35E+00	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	2.6869E-01	583.14	2.687E-01	(P	5.651E-02	2.80E-02	G
		510.72	4.249E-01	+	2.272E-01	9.69E-02	G
PB-212	5.7823E-01	238.63	5.782E-01	@(	1.177E-01	4.45E-02	G K
		77.11	7.516E-01	+	6.519E-01	2.03E-01	G
		74.81	8.654E-01	& P	1.323E+00	4.04E-01	G
PB-214	5.5424E-01	351.99	4.982E-01	@(P	1.021E-01	4.44E-02	G K
		295.22	6.166E-01	(	2.048E-01	7.59E-02	G
		77.11	1.229E+00	+	1.066E+00	3.32E-01	G
		241.92	6.723E-01	(	6.662E-01	2.09E-01	G
BI-212	1.6670E-01	727.17	1.667E-01	% (	3.947E-01	1.19E-01	G K
		1620.56	1.880E-01	% P	1.778E+00	4.59E-01	G
		785.42	2.825E-01	% P	2.979E+00	8.44E-01	G
BI-214	4.5864E-01	609.32	4.586E-01	@(	1.185E-01	5.48E-02	G K
		1764.51	9.570E-02	% P	5.160E-01	1.45E-01	G
		1120.28	6.632E-01	+	4.316E-01	1.57E-01	G
RA-224	1.2927E+00	241.00	1.293E+00	(P	1.283E+00	4.02E-01	G
RA-226	1.0638E+00	185.99	1.064E+00	(P	1.384E+00	4.26E-01	G
AC-228	2.5270E-01	911.07	1.535E-02	% (P	2.579E-01	7.31E-02	G K
		968.90	1.361E-01	% P	5.085E-01	1.50E-01	G
		338.40	8.258E-01	(	3.591E-01	1.27E-01	G
TH-227	-4.1683E-01	236.00	4.168E-01	& (P	5.864E-01	1.80E-01	G K
		256.25	1.342E-01	&	6.176E-01	1.83E-01	G
PA-234	-4.2089E-02	98.44	4.209E-02	% (	2.665E-01	7.96E-02	G K
		946.00	4.023E-02	%	2.742E-01	7.73E-02	G
		131.28	6.979E-03	&	2.568E-01	7.61E-02	G
		94.67	3.262E-02	%	4.171E-01	1.24E-01	G
		883.24	1.249E-01	%	3.737E-01	1.10E-01	G
		926.70	8.571E-03	&	5.538E-01	1.53E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
		569.26	6.177E-02	%	4.629E-01	1.33E-01	G
TH-234	1.3369E+00						
		63.29	1.337E+00	&(P	4.984E+00	1.50E+00	G K
		92.80	1.434E+00	%	2.623E+00	7.98E-01	G
		92.38	1.677E+00	% P	3.099E+00	9.42E-01	G

AM-241 -8.4255E-02
59.54-8.425E-02 %(7.205E-01 2.15E-01 G
(- This peak used in the nuclide activity average.

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

Nuclide Codes:

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 *****						
		Time of Count	Time Corrected	Uncertainty	3 Sigma	
Nuclide		Activity	Activity	Counting	Total	MDA
		pCi/gm	pCi/gm	pCi/gm	pCi/gm	pCi/gm
BE-7	#A	1.4014E-01	1.4454E-01	3.2196E-01	3.2206E-01	3.473E-01
K-40		1.4192E+01	1.4192E+01	1.9231E+00	2.0815E+00	2.129E-01
MN-54	#A	1.4578E-02	1.4656E-02	3.7903E-02	3.7912E-02	4.288E-02
CO-57	#B	2.9550E-03	2.9731E-03	5.4655E-02	5.4655E-02	6.104E-02
CO-60	#B	-4.8434E-04	-4.8476E-04	1.4740E-01	1.4740E-01	6.775E-02

Sr-85	#A	-1.6606E-02	-1.7034E-02	5.3865E-02	5.3873E-02	5.905E-02
Kr-85	#A	-3.8333E+02	-3.8334E+02	1.2123E+03	1.2124E+03	1.363E+03
Y-88	#B	-5.4584E-03	-5.5435E-03	3.9042E-02	3.9044E-02	4.938E-02
NB-94	#B	2.8707E-02	2.8707E-02	5.2800E-02	5.2825E-02	5.777E-02
Ag-108M	#B	-7.9254E-03	-7.9257E-03	4.6322E-02	4.6324E-02	5.431E-02
CD-109	#A	-1.0599E-01	-1.0638E-01	2.4926E+00	2.4926E+00	1.708E+00
SN-113	#B	8.5628E-03	8.6865E-03	5.7552E-02	5.7554E-02	6.515E-02
SB-125	#B	7.0392E-02	7.0507E-02	8.3323E-02	8.3417E-02	1.418E-01
I-131	#B	-3.8339E-03	-4.7078E-03	5.9523E-02	5.9523E-02	5.571E-02
CS-134	#B	1.0836E-02	1.0860E-02	4.0202E-02	4.0207E-02	4.602E-02
CS-137	#A	-8.4591E-03	-8.4604E-03	5.0147E-02	5.0149E-02	5.848E-02
CE-139	#A	-2.6290E-03	-2.6607E-03	6.0529E-02	6.0529E-02	5.536E-02
EU-152	#F	1.8704E-01	1.8710E-01	1.3163E-01	1.3203E-01	1.571E-01
EU-154	#B	1.0508E-02	1.0514E-02	1.0974E-01	1.0975E-01	1.231E-01
EU-155	#B	6.8302E-02	6.8364E-02	2.4902E-01	2.4905E-01	2.764E-01
HG-203	#B	-2.7062E-03	-2.8038E-03	5.5006E-02	5.5006E-02	5.715E-02
TL-208		2.6869E-01	2.6869E-01	8.3726E-02	8.5073E-02	
PB-212	#	5.7823E-01	5.7823E-01	1.3364E-01	1.3752E-01	1.177E-01
PB-214	#	5.5424E-01	5.5424E-01	1.4815E-01	1.5138E-01	1.021E-01
BI-212	#B	1.6670E-01	1.6670E-01	3.5561E-01	3.5573E-01	3.947E-01
BI-214		4.5864E-01	4.5864E-01	1.6400E-01	1.6601E-01	
RA-224	#	1.2927E+00	1.2927E+00	1.2053E+00	1.2075E+00	1.283E+00
RA-226	#A	1.0638E+00	1.0638E+00	1.2775E+00	1.2789E+00	1.384E+00
AC-228	B	2.5270E-01	2.5270E-01	1.1699E-01	1.1785E-01	2.579E-01
TH-227	#B	-4.1683E-01	-4.1683E-01	5.4310E-01	5.4360E-01	5.864E-01
PA-234	#B	-4.2089E-02	-4.2089E-02	2.3887E-01	2.3888E-01	2.665E-01
TH-234	#B	1.3369E+00	1.3369E+00	4.4894E+00	4.4900E+00	4.984E+00
AM-241	#A	-8.4254E-02	-8.4255E-02	6.4392E-01	6.4393E-01	7.205E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
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) 1.5172068E+01 pCi/gm
Total Decayed Activity (1460.5 to 1999.0 keV) 1.5172068E+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-13-01-006-F

Spectrum Filename: C:\GammaVision\Spectra\102F_20JUL2006_1547.An1

Acquisition information

Start time: 20-Jul-2006 15:47:08
Live time: 2000
Real time: 2016
Dead time: 0.81 %
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: 1.4350E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.4350E+03) =
 6.9686E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	18-Jul-2006 10:42:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	102_150K_28APR05.Pbc 01-May-2005 05:27:47
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 13 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.6743

***** S U M M A R Y O F P E A K S I N R A N G E *****								
Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
76.80	280.	14.25	0.84	9.449E-03				
76.80	280.	14.25	0.84	9.449E-03	77.11	10.700	2.587E+00	PB214
					77.11	17.500	1.582E+00	PB212
87.04	114.	35.52	1.22	1.212E-02	86.45	32.740	PBC<MDA	EU155
					88.04	3.790	PBC<MDA	CD109
186.00	80.	36.33	1.04	1.627E-02	185.99	3.280	PBC<MDA	RA226
209.95	57.	36.24	1.33	1.516E-02				
239.08	547.	5.07	1.22	1.379E-02	238.63	43.100	8.650E-01	PB212
241.82	67.	31.27	1.22	1.366E-02	241.00	3.900	PBC<MDA	RA224
					241.92	7.470	6.174E-01	PB214
295.53	126.	16.97	1.17	1.145E-02	295.22	19.200	5.399E-01	PB214
301.13	68.	27.86	1.88	1.125E-02				
339.16	106.	19.27	1.07	1.004E-02	338.40	12.010	8.231E-01	AC228
352.59	156.	12.60	1.15	9.663E-03	351.99	37.100	4.086E-01	PB214
511.64	96.	14.41	1.37	6.683E-03	510.72	22.500	5.970E-01	TL208
584.16	157.	10.67	0.85	5.880E-03	583.14	86.000	2.913E-01	TL208
610.59	114.	11.93	1.61	5.638E-03	609.32	46.090	4.116E-01	BI214
662.72	87.	15.82	1.62	5.221E-03	661.62	84.620	1.843E-01	CS137
728.76	55.	26.69	0.79	4.785E-03				
912.62	133.	10.32	1.86	3.916E-03	911.07	29.000	1.103E+00	AC228
969.46	95.	14.94	1.96	3.716E-03	968.90	17.460	1.378E+00	AC228
1122.02	55.	21.98	0.67	3.283E-03	1120.28	15.040	1.043E+00	BI214
1462.99	387.	5.08	2.13	2.617E-03	1460.75	10.700	1.299E+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
371.60	186.00	284.	80.	0.040	108.98	1.042	PA-234 1

Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM	Suspected
419.52	209.95	168.	57.	0.029	108.71	1.331	NP-239 M
477.79	238.98	110.	547.	0.273	15.21	1.215	PB-212 D
483.27	241.72	185.	67.	0.033	93.80	1.217	PB-214 D
601.92	301.13	110.	68.	0.034	83.57	1.880	PB-212 sM
1457.47	728.76	50.	49.	0.024	74.78	0.792	J-132 sM
1825.38	912.62	18.	131.	0.066	29.59	1.860	AC-228 sM
1939.13	969.46	83.	40.	0.020	106.66	1.957	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	Centroid	Background	Net Area	Intensity	Uncert	FWHM
	Channel	Energy	Counts	Counts	Cts/Sec	3 Sigma	% keV
PB-214	153.80	77.11	696.	158.	0.079	74.80	1.500D
PB-212	153.80	77.11	696.	158.	0.079	74.80	1.500D
CD-109	174.10	87.26	585.	103.	0.051	102.54	1.500
PB-212	477.77	239.07	242.	451.	0.225	20.35	1.500
PB-214	591.06	295.70	121.	110.	0.055	51.04	1.500
AC-228	677.64	338.98	102.	85.	0.043	59.68	1.500
PB-214	704.94	352.63	71.	142.	0.071	35.38	1.500
TL-208	1023.07	511.64	38.	96.	0.048	43.22	1.368s
TL-208	1168.15	584.16	40.	157.	0.078	32.00	0.854s
BI-214	1221.03	610.59	25.	114.	0.057	35.79	1.608s
CS-137	1325.35	662.72	37.	87.	0.043	47.45	1.617
AC-228	1941.52	970.66	35.	55.	0.027	61.49	1.718
BI-214	2244.43	1122.02	24.	55.	0.027	65.95	0.674s
K-40	2927.00	1463.05	6.	368.	0.184	15.87	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 -	Average	----- Peak -----					
Name	Code	Activity	Energy	Activity	Code	MDA Value	COMMENTS
		pCi/gm	keV	pCi/gm		pCi/gm	

BE-7 -5.1134E-02
477.56-5.113E-02 &(4.950E-01 1.42E-01 G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
K-40	1.2367E+01	1460.75	1.237E+01	(P	4.729E-01	6.55E-01	G
MN-54	-1.0210E-03	834.81	-1.021E-03	%(P	6.356E-02	1.74E-02	G
CO-57	0.0000E+00	122.07	0.000E+00	%(	6.642E-02	1.96E-02	G K
		136.43	3.993E-03	&	4.745E-01	1.40E-01	G
CO-60	1.4615E-02	1332.51	1.461E-02	%(P	6.904E-02	1.95E-02	G K
		1173.23	7.999E-03	%	6.810E-02	1.89E-02	G K
Sr-85	5.6184E-03	514.00	5.618E-03	%(	4.427E-02	1.26E-02	G
Kr-85	1.1958E+02	513.99	1.196E+02	%(	1.066E+03	3.03E+02	G
Y-88	1.0789E-02	1836.01	1.079E-02	%(P	5.479E-02	1.47E-02	G K
		898.02	-3.506E-03	& P	6.258E-02	1.68E-02	G
NB-94	5.8391E-04	871.10	5.839E-04	%(	5.378E-02	1.45E-02	G K
		702.50	-2.887E-03	%	5.128E-02	1.42E-02	G K
Ag-108M	-9.3956E-03	722.95	-9.396E-03	%(	6.895E-02	1.97E-02	G K
		614.37	-2.437E-02	% P	7.693E-02	2.28E-02	G
		433.93	1.846E-03	&	5.149E-02	1.46E-02	G
CD-109	2.0761E+00	88.04	2.076E+00	(P	2.330E+00	7.20E-01	G
SN-113	7.6778E-03	391.71	7.678E-03	&(	7.851E-02	2.27E-02	G K
		255.04	-6.335E-01	%	2.530E+00	7.54E-01	G
SB-125	2.8618E-02	427.95	2.862E-02	%(P	1.495E-01	4.32E-02	G K
		600.77	7.824E-02	% P	2.068E-01	6.13E-02	G
		636.15	-7.841E-02	% P	5.310E-01	1.52E-01	G
		463.51	3.155E-01	% P	4.565E-01	1.42E-01	G
		176.29	-1.217E-02	% P	7.610E-01	2.23E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
I-131	0.0000E+00	364.48	0.000E+00	&(	7.672E-02	2.21E-02	G K
		636.97	1.111E-01	%	9.060E-01	2.57E-01	G
		284.29	1.687E-02	&	9.682E-01	2.81E-01	G
CS-134	-5.8698E-03	604.66	5.870E-03	% (	4.922E-02	1.39E-02	G K
		795.76	4.696E-02	%	6.817E-02	2.16E-02	G
		569.29	2.803E-03	&	2.389E-01	6.44E-02	G
		801.84	5.699E-03	& P	6.454E-01	1.76E-01	G
CS-137	1.8432E-01	661.62	1.843E-01	(	6.642E-02	2.92E-02	G
CE-139	-6.3825E-04	165.85	6.383E-04	%(P	5.425E-02	1.59E-02	G
EU-152	-4.4780E-02	121.78	4.478E-02	%(P	1.875E-01	5.60E-02	G K
		344.30	3.065E-02	&	1.897E-01	5.57E-02	G
		1408.08	6.702E-02	&	3.436E-01	9.66E-02	G
		964.00	1.232E-01	& P	6.194E-01	1.79E-01	G
		1112.07	1.715E-01	%	4.456E-01	1.32E-01	G
		778.90	1.343E-01	% P	5.482E-01	1.60E-01	G
EU-154	3.7909E-02	123.10	3.791E-02	%(P	1.326E-01	3.98E-02	G K
		1274.80	1.413E-03	%	2.455E-01	6.72E-02	G
		723.30	5.516E-02	% P	3.418E-01	9.80E-02	G
		1004.80	1.038E-01	&	4.561E-01	1.32E-01	G
EU-155	1.1284E-02	86.45	1.128E-02	%(P	3.176E-01	9.44E-02	G K
		105.31	7.110E-02	%	2.696E-01	8.08E-02	G
HG-203	2.3022E-02	279.17	2.302E-02	%(P	5.395E-02	1.63E-02	G K
		72.87	4.912E-01	&	2.493E+00	7.48E-01	G
		70.83	2.573E-01	&	3.717E+00	1.10E+00	G
		82.50	4.195E-02	&	5.254E+00	1.56E+00	G
TL-208	2.9131E-01	583.14	2.913E-01	(P	6.004E-02	3.12E-02	G
		510.72	5.970E-01	+	1.953E-01	8.62E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
PB-212	7.1370E-01	238.63	7.137E-01	(	1.191E-01	4.84E-02	G K
							Energy duplication
		77.11	8.907E-01	+	7.088E-01	2.22E-01	G
		74.81	7.449E-01	& P	1.423E+00	4.32E-01	G
PB-214	4.0705E-01	351.99	3.736E-01	(P	1.100E-01	4.42E-02	G K
		295.22	4.716E-01	(	2.307E-01	8.02E-02	G
							Energy duplication
		77.11	1.457E+00	+	1.159E+00	3.63E-01	G
BI-212	9.6974E-02	241.92	1.675E-01	%	8.455E-01	2.52E-01	G
		727.17	9.697E-02	%(	5.215E-01	1.50E-01	G K
		1620.56	9.466E-02	% P	2.065E+00	5.16E-01	G
		785.42-4.742E-01		% P	3.288E+00	9.38E-01	G
BI-214	4.1158E-01	609.32	4.116E-01	@(	9.441E-02	4.92E-02	G K
		1764.51-1.057E-01		% P	5.667E-01	1.59E-01	G
		1120.28	1.043E+00	+	4.898E-01	2.30E-01	G
RA-224	3.7885E-01	241.00	3.789E-01	%(P	1.532E+00	4.57E-01	G
RA-226	7.9343E-01						Energy duplication
		185.99	7.934E-01	%(P	1.514E+00	4.59E-01	G
AC-228	3.8228E-01	911.07	1.784E-02	%(P	3.096E-01	8.79E-02	G K
		968.90	7.925E-01	(P	4.420E-01	1.63E-01	G
		338.40	6.659E-01	(	3.874E-01	1.32E-01	G
TH-227	-2.9719E-01	236.00-2.972E-01		%(P	5.913E-01	1.79E-01	G K
		256.25	1.985E-03	&	6.856E-01	1.99E-01	G
PA-234	7.5747E-02	98.44	7.575E-02	%(	2.700E-01	8.10E-02	G K
		946.00-8.903E-03		%	2.894E-01	7.83E-02	G
		131.28-3.305E-02		%	2.798E-01	8.32E-02	G
		94.67-4.727E-03		%	5.190E-01	1.54E-01	G
		883.24	0.000E+00	%	5.084E-01	1.38E-01	G
		926.70-1.103E-01		&	5.622E-01	1.60E-01	G
		569.26	1.745E-02	&	4.194E-01	1.16E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TH-234	1.2219E+00						
		63.29	1.222E+00	&(P	5.459E+00	1.63E+00	G K
		92.80	1.921E+00	%	2.684E+00	8.23E-01	G
		92.38	1.265E-01	% P	3.044E+00	9.03E-01	G

AM-241	-1.0673E-01	59.54	-1.067E-01	&(	8.101E-01	2.41E-01	G
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(- This peak used in the nuclide activity average.

- * - Peak is too wide, but only one peak in library.
- ! - Peak is part of a multiplet and this area went negative during deconvolution.
- ? - Peak is too narrow.
- @ - Peak is too wide at FW25M, but ok at FWHM.
- % - Peak fails sensitivity test.
- \$ - Peak identified, but first peak of this nuclide failed one or more qualification tests.
- + - Peak activity higher than counting uncertainty range.
- - Peak activity lower than counting uncertainty range.
- = - Peak outside analysis energy range.
- & - Calculated peak centroid is not close enough to the 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 *****						
Time of Count		Time Corrected		Uncertainty		3 Sigma
Nuclide	Activity	Activity	Activity	Counting	Total	MDA
	pCi/gm	pCi/gm	pCi/gm	pCi/gm	pCi/gm	pCi/gm
BE-7 #A	-4.9686E-02	-5.1134E-02	4.2537E-01	4.2538E-01	4.810E-01	
K-40	1.2367E+01	1.2367E+01	1.9640E+00	2.0830E+00	4.729E-01	
MN-54 #A	-1.0160E-03	-1.0210E-03	1.4388E-01	1.4388E-01	6.325E-02	
CO-57 #B	0.0000E+00	0.0000E+00	5.8851E-02	5.8851E-02	6.605E-02	
CO-60 #B	1.4603E-02	1.4615E-02	5.8445E-02	5.8451E-02	6.898E-02	
Sr-85 #A	5.4871E-03	5.6184E-03	3.7698E-02	3.7700E-02	4.324E-02	

Kr-85	#A	1.1958E+02	1.1958E+02	9.0913E+02	9.0916E+02	1.066E+03
Y-88	#B	1.0635E-02	1.0789E-02	4.4066E-02	4.4070E-02	5.400E-02
NB-94	#B	5.8391E-04	5.8391E-04	4.3409E-02	4.3409E-02	5.378E-02
Ag-108M	#B	-9.3953E-03	-9.3956E-03	5.9013E-02	5.9016E-02	6.895E-02
CD-109	#A	2.0691E+00	2.0761E+00	2.1597E+00	2.1628E+00	2.322E+00
SN-113	#B	7.5762E-03	7.6778E-03	6.8134E-02	6.8136E-02	7.747E-02
SB-125	#B	2.8574E-02	2.8618E-02	1.2969E-01	1.2970E-01	1.493E-01
I-131	#B	0.0000E+00	0.0000E+00	6.6150E-02	6.6150E-02	6.340E-02
CS-134	#B	-5.8578E-03	-5.8698E-03	4.1709E-02	4.1710E-02	4.912E-02
CS-137		1.8429E-01	1.8432E-01	8.7450E-02	8.8060E-02	
CE-139	#A	-6.3117E-04	-6.3825E-04	1.3525E-01	1.3525E-01	5.365E-02
EU-152	#B	-4.4765E-02	-4.4780E-02	1.8113E-01	1.8115E-01	1.874E-01
EU-154	#B	3.7891E-02	3.7909E-02	1.1934E-01	1.1936E-01	1.326E-01
EU-155	#B	1.1275E-02	1.1284E-02	2.8327E-01	2.8327E-01	3.173E-01
HG-203	#B	2.2277E-02	2.3022E-02	4.8817E-02	4.8834E-02	5.221E-02
TL-208		2.9131E-01	2.9131E-01	9.3458E-02	9.4877E-02	
PB-212	#	7.1370E-01	7.1370E-01	1.4525E-01	1.5067E-01	1.191E-01
PB-214	#	4.0705E-01	4.0705E-01	1.2651E-01	1.2855E-01	1.100E-01
BI-212	B	9.6974E-02	9.6974E-02	4.5018E-01	4.5021E-01	5.215E-01
BI-214	#	4.1158E-01	4.1158E-01	1.4732E-01	1.4912E-01	
RA-224	#A	3.7885E-01	3.7885E-01	1.3722E+00	1.3724E+00	1.532E+00
RA-226	#A	7.9343E-01	7.9343E-01	1.3768E+00	1.3776E+00	1.514E+00
AC-228	F	3.8228E-01	3.8228E-01	2.2815E-01	2.2916E-01	3.096E-01
TH-227	#B	-2.9719E-01	-2.9719E-01	5.4471E-01	5.4497E-01	5.913E-01
PA-234	#B	7.5747E-02	7.5747E-02	2.4302E-01	2.4305E-01	2.700E-01
TH-234	#B	1.2219E+00	1.2219E+00	4.9031E+00	4.9036E+00	5.459E+00
AM-241	#A	-1.0673E-01	-1.0673E-01	7.2408E-01	7.2411E-01	8.101E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
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) 1.3636672E+01 pCi/gm
Total Decayed Activity (295.2 to 1999.0 keV) 1.3636698E+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-13-01-013-F

Spectrum Filename: C:\GammaVision\Spectra\102F_20JUL2006_1624.An1

Acquisition information

Start time: 20-Jul-2006 16:24:08
Live time: 2000
Real time: 2017
Dead time: 0.84 %
Detector ID: 3

Detector system

Det 102 - DSPP-468

Calibration

Filename: D2_1LSa.Clb
DET 102 1 Liter Sand Geometry

Energy Calibration

Created: 15-Jan-2005 03:09:29
Zero offset: 0.220 keV
Gain: 0.500 keV/channel
Quadratic: $-6.435\text{E-}08 \text{ keV/channel}^2$

Efficiency Calibration

Created: 15-Jan-2005 06:48:10
Type: Polynomial
Uncertainty: 0.497 %
Coefficients: -0.294180 -5.980622 0.744607
-0.096737 0.005214 -0.000120

Library Files

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

Analysis parameters

Analysis engine: Env32 G53W4.20
Start channel: 100 (50.22keV)
Stop channel: 4000 (1999.02keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 1.5550E+03
Activity scaling factor: $1.0000\text{E}+06 / (1.0000\text{E}+00 * 1.5550\text{E}+03) = 6.4309\text{E}+02$
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	18-Jul-2006 11:10:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	102_150K_28APR05.Pbc 01-May-2005 05:27:47
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 13 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.7710

***** S U M M A R Y O F P E A 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	152.	25.05	1.50	9.541E-03	77.11	10.700	1.294E+00	PB214
					77.11	17.500	7.909E-01	PB212
77.16	152.	25.05	1.50	9.541E-03	77.11	10.700	1.294E+00	PB214
					77.11	17.500	7.909E-01	PB212
185.75	106.	28.04	1.20	1.628E-02				
185.75	106.	28.04	1.20	1.628E-02	185.99	3.280	1.647E+00	RA226
239.07	527.	5.13	1.22	1.378E-02	238.63	43.100	7.691E-01	PB212
242.18	69.	25.01	1.22	1.364E-02	241.00	3.900	PBC<MDA	RA224
					241.92	7.470	5.907E-01	PB214
295.38	98.	18.12	1.07	1.146E-02	295.22	19.200	3.869E-01	PB214
339.04	100.	19.07	0.90	1.004E-02	338.40	12.010	7.222E-01	AC228
352.39	157.	13.59	1.48	9.668E-03	351.99	37.100	3.785E-01	PB214
464.02	34.	36.60	1.50	7.365E-03	463.51	10.000	PBC<MDA	SB125
584.36	141.	12.59	1.27	5.878E-03	583.14	86.000	2.414E-01	TL208
610.16	96.	13.21	1.82	5.642E-03	609.32	46.090	3.217E-01	BI214
662.72	39.	30.72	1.41	5.221E-03	661.62	84.620	7.699E-02	CS137
728.59	40.	22.32	1.34	4.786E-03	727.17	11.800	6.222E-01	BI212
861.55	33.	29.24	1.53	4.119E-03				
912.71	126.	11.90	2.17	3.916E-03	911.07	29.000	9.572E-01	AC228
970.58	94.	18.55	0.89	3.712E-03	968.90	17.460	1.265E+00	AC228
1121.72	60.	26.83	1.38	3.280E-03	1120.28	15.040	1.060E+00	BI214
1454.56	12.	28.65	2.04	2.630E-03				
1463.09	396.	5.12	2.04	2.617E-03	1460.75	10.700	1.227E+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	
477.77	239.08	102.	527.	0.263	15.40	1.215	PB-212	D	
483.99	242.18	116.	69.	0.035	75.03	1.217	PB-214	D	
677.75	339.04	99.	100.	0.050	51.90	0.896	AC-228	M	
1024.30	512.26	46.	69.	0.034	63.49	1.501	RH-106M	l	
1723.18	861.55	22.	33.	0.016	87.73	1.534	TL-208	M	
1825.57	912.71	34.	123.	0.062	33.66	2.167	AC-228	sM	
1941.36	970.58	97.	47.	0.024	99.07	0.891	AC-228	sM	
2243.83	1121.72	42.	60.	0.030	80.48	1.379	TA-182	l	
2909.90	1454.50	0.	11.	0.005	90.45	0.562	J-134	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	649.	152.	0.076	75.16	1.500D
PB-212	153.80	77.11	649.	152.	0.076	75.16	1.500D
RA-226	372.79	186.59	256.	81.	0.041	84.80	1.500s
PB-212	477.73	239.05	247.	452.	0.226	20.43	1.500s
PB-214	591.13	295.74	90.	96.	0.048	51.71	1.500
PB-214	704.61	352.46	90.	153.	0.077	35.55	1.500
SB-125	927.79	464.02	69.	34.	0.017	109.80	1.500s
TL-208	1168.56	584.36	53.	141.	0.070	37.78	1.267
BI-214	1220.17	610.16	29.	96.	0.048	39.63	1.824s
Ag-108M	1224.82	612.48	130.	-43.	-0.022	121.04	1.499s
CS-137	1325.33	662.72	38.	39.	0.020	92.17	1.410s
BI-212	1457.14	728.59	16.	40.	0.020	66.97	1.344s
AC-228	1941.15	970.47	37.	47.	0.024	69.40	1.718
K-40	2927.13	1463.11	9.	387.	0.193	15.61	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 -		Average	----- Peak -----				
Name	Code	Activity pCi/gm	Energy keV	Activity pCi/gm	Code	MDA Value pCi/gm	COMMENTS
BE-7		0.0000E+00	477.56	0.000E+00	% (	4.996E-01 1.42E-01	G
K-40		1.1989E+01	1460.75	1.199E+01	(P	5.244E-01 6.24E-01	G
MN-54		-8.3745E-03	834.81	-8.374E-03	%(P	5.957E-02 1.68E-02	G
CO-57		1.0327E-03	122.07	1.033E-03	%(	5.727E-02 1.69E-02	G K
			136.43	6.269E-02	%	4.463E-01 1.33E-01	G
CO-60		2.4857E-02	1332.51	2.486E-02	%(P	5.295E-02 1.61E-02	G K
			1173.23	0.000E+00	%	9.535E-02 2.67E-02	G K
Sr-85		-2.2904E-03	514.00	-2.290E-03	&(	5.314E-02 1.51E-02	G
Kr-85		-5.0049E+01	513.99	-5.005E+01	&(	1.197E+03 3.41E+02	G
Y-88		-2.7107E-05	1836.01	-2.711E-05	%(P	3.044E-02 4.13E-03	G K
			898.02	-1.176E-02	% P	7.222E-02 2.04E-02	G
NB-94		-1.1582E-02	871.10	-1.158E-02	&(	7.105E-02 2.04E-02	G K
			702.50	2.313E-04	%	4.698E-02 1.28E-02	G K
Ag-108M		1.9070E-02	722.95	1.907E-02	%(	4.438E-02 1.33E-02	G K
			614.37	-7.435E-02	& P	9.585E-02 2.99E-02	G
			433.93	1.540E-02	&	4.479E-02 1.33E-02	G
CD-109		3.7328E-02	88.04	3.733E-02	%(P	2.530E+00 7.53E-01	G
SN-113		-1.0128E-02	391.71	-1.013E-02	%(	7.400E-02 2.15E-02	G K
			255.04	-5.901E-02	&	2.119E+00 6.18E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	1.1795E-01	427.95	2.180E-02	&(P	1.430E-01	4.12E-02	G K
		600.77	1.154E-03	% P	3.508E-01	9.96E-02	G
		636.15	2.150E-02	& P	5.455E-01	1.55E-01	G
		463.51	4.026E-01	*(P	4.884E-01	1.54E-01	G
		176.29	7.609E-02	& P	6.462E-01	1.90E-01	G
I-131	2.5243E-03	364.48	2.524E-03	&(	6.017E-02	1.72E-02	G K
		636.97	0.000E+00	%	9.314E-01	2.61E-01	G
		284.29	1.809E-01	%	7.741E-01	2.29E-01	G
CS-134	1.6690E-03	604.66	1.669E-03	% (	6.688E-02	1.91E-02	G K
		795.76	2.594E-02	%	5.671E-02	1.72E-02	G
		569.29	3.381E-02	%	3.085E-01	8.78E-02	G
		801.84	5.844E-02	% P	5.520E-01	1.53E-01	G
CS-137	7.6994E-02	661.62	7.699E-02	(	6.160E-02	2.37E-02	G
CE-139	8.7608E-03	165.85	8.761E-03	&(P	5.744E-02	1.71E-02	G
EU-152	-2.2621E-02	121.78	2.262E-02	%(P	1.461E-01	4.32E-02	G K
		344.30	3.242E-03	%	1.683E-01	4.85E-02	G
		1408.08	0.000E+00	%	3.271E-01	8.68E-02	G
		964.00	6.710E-02	& P	5.043E-01	1.43E-01	G
		1112.07	3.132E-02	%	5.011E-01	1.38E-01	G
		778.90	3.434E-02	% P	4.137E-01	1.15E-01	G
EU-154	-1.6485E-02	123.10	1.648E-02	%(P	1.258E-01	3.74E-02	G K
		1274.80	4.291E-03	%	2.088E-01	5.68E-02	G
		723.30	2.055E-03	% P	3.356E-01	9.41E-02	G
		1004.80	1.037E-03	%	3.661E-01	9.99E-02	G
EU-155	3.0041E-02	86.45	3.004E-02	%(P	2.940E-01	8.77E-02	G K
		105.31	2.337E-02	%	2.414E-01	7.15E-02	G
HG-203	-2.1282E-02	279.17	2.128E-02	&(P	6.403E-02	1.92E-02	G K
		72.87	9.658E-01	%	2.277E+00	6.89E-01	G
		70.83	1.660E+00	&	4.160E+00	1.26E+00	G
		82.50	1.565E-01	&	4.526E+00	1.35E+00	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	2.4138E-01	583.14	2.414E-01	(P	6.302E-02	3.05E-02	G
		510.72	1.228E-02	&	2.534E-01	7.26E-02	G
PB-212	6.9768E-01	238.63	6.598E-01	@(	1.110E-01	4.49E-02	G K
		77.11	7.909E-01	@(	6.319E-01	1.98E-01	G
		74.81	6.451E-01	& P	1.322E+00	4.01E-01	G
PB-214	3.7443E-01	351.99	3.713E-01	(P	1.133E-01	4.41E-02	G K
		295.22	3.806E-01	(	1.851E-01	6.56E-02	G
		77.11	1.294E+00	+	1.033E+00	3.24E-01	G
		241.92	4.091E-01	%	7.188E-01	2.19E-01	G
BI-212	6.2217E-01	727.17	6.222E-01	*(	3.324E-01	1.39E-01	G K
		1620.56	4.424E-02	% P	9.716E-01	1.32E-01	G
		785.42	3.210E-01	% P	2.455E+00	6.88E-01	G
BI-214	3.2175E-01	609.32	3.217E-01	(	9.222E-02	4.26E-02	G K
		1764.51	2.126E-03	% P	4.113E-01	1.04E-01	G
		1120.28	2.454E-01	%	5.030E-01	1.53E-01	G
RA-224	8.6893E-01	241.00	8.689E-01	&(P	1.355E+00	4.15E-01	G
RA-226	1.3267E+00	185.99	1.327E+00	*(P	1.259E+00	3.96E-01	G
AC-228	2.4905E-01	911.07	1.647E-02	%(P	2.766E-01	7.84E-02	G K
		968.90	6.353E-01	(P	4.139E-01	1.47E-01	G
		338.40	7.657E-03	%	4.336E-01	1.26E-01	G
TH-227	-1.7007E-01	236.00	1.701E-01	&(P	4.577E-01	1.38E-01	G K
		256.25	1.447E-01	%	6.576E-01	1.95E-01	G
PA-234	1.7346E-02	98.44	1.735E-02	%(	1.975E-01	5.83E-02	G K
		946.00	5.692E-02	%	3.190E-01	9.11E-02	G
		131.28	2.172E-02	%	2.012E-01	5.95E-02	G
		94.67	1.388E-01	%	5.120E-01	1.54E-01	G
		883.24	1.734E-01	%	3.436E-01	1.05E-01	G
		926.70	0.000E+00	&	5.573E-01	1.52E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
		569.26	5.021E-02	%	4.568E-01	1.30E-01	G
TH-234	1.3433E+00						
		63.29	1.343E+00	&(P	5.056E+00	1.52E+00	G K
		92.80	1.077E+00	%	2.651E+00	8.01E-01	G
		92.38	1.135E+00	% P	3.204E+00	9.66E-01	G

AM-241 8.7741E-03
 59.54 8.774E-03 &(7.584E-01 2.25E-01 G
 (- This peak used in the nuclide activity average.

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

Nuclide Codes:

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 *****						
		Time of Count	Time Corrected	Uncertainty	3 Sigma	
Nuclide		Activity	Activity	Counting	Total	MDA
		pCi/gm	pCi/gm	pCi/gm	pCi/gm	pCi/gm
BE-7	#A	0.0000E+00	0.0000E+00	4.2486E-01	4.2486E-01	4.854E-01
K-40		1.1989E+01	1.1989E+01	1.8717E+00	1.9890E+00	5.244E-01
MN-54	#A	-8.3333E-03	-8.3745E-03	5.6058E-02	5.6060E-02	5.928E-02
CO-57	#B	1.0268E-03	1.0327E-03	5.0697E-02	5.0697E-02	5.694E-02
CO-60	#B	2.4837E-02	2.4857E-02	4.8287E-02	4.8307E-02	5.291E-02

Sr-85	#A	-2.2367E-03	-2.2904E-03	4.5362E-02	4.5362E-02	5.189E-02
Kr-85	#A	-5.0048E+01	-5.0049E+01	1.0217E+03	1.0217E+03	1.197E+03
Y-88	#B	-2.6719E-05	-2.7107E-05	1.6264E-04	1.6265E-04	3.000E-02
NB-94	#B	-1.1582E-02	-1.1582E-02	6.1272E-02	6.1275E-02	7.105E-02
Ag-108M	#B	1.9069E-02	1.9070E-02	4.0015E-02	4.0029E-02	4.437E-02
CD-109	#A	3.7202E-02	3.7328E-02	2.2577E+00	2.2577E+00	2.521E+00
SN-113	#B	-9.9933E-03	-1.0128E-02	6.4605E-02	6.4607E-02	7.302E-02
SB-125	#B	1.1778E-01	1.1795E-01	1.3539E-01	1.3555E-01	1.427E-01
I-131	#B	2.0849E-03	2.5243E-03	5.1673E-02	5.1674E-02	4.970E-02
CS-134	#B	1.6656E-03	1.6690E-03	5.7226E-02	5.7226E-02	6.674E-02
CS-137	#	7.6983E-02	7.6994E-02	7.0963E-02	7.1095E-02	
CE-139	#A	8.6634E-03	8.7608E-03	5.1187E-02	5.1190E-02	5.680E-02
EU-152	#B	-2.2613E-02	-2.2621E-02	1.4881E-01	1.4882E-01	1.460E-01
EU-154	#B	-1.6477E-02	-1.6485E-02	1.1585E-01	1.1585E-01	1.258E-01
EU-155	#B	3.0016E-02	3.0041E-02	2.6299E-01	2.6300E-01	2.937E-01
HG-203	#B	-2.0591E-02	-2.1282E-02	5.8025E-02	5.8037E-02	6.195E-02
TL-208		2.4138E-01	2.4138E-01	9.1446E-02	9.2444E-02	
PB-212	#	6.9768E-01	6.9768E-01	1.4256E-01	1.4784E-01	1.110E-01
PB-214	#	3.7443E-01	3.7443E-01	1.1758E-01	1.1945E-01	1.133E-01
BI-212	#	6.2217E-01	6.2217E-01	4.1669E-01	4.1815E-01	
BI-214		3.2175E-01	3.2175E-01	1.2751E-01	1.2879E-01	
RA-224	#A	8.6893E-01	8.6893E-01	1.2449E+00	1.2458E+00	1.355E+00
RA-226	#	1.3267E+00	1.3267E+00	1.1866E+00	1.1889E+00	1.259E+00
AC-228	B	2.4905E-01	2.4905E-01	1.7297E-01	1.7353E-01	2.766E-01
TH-227	#B	-1.7007E-01	-1.7007E-01	4.2090E-01	4.2101E-01	4.577E-01
PA-234	#B	1.7346E-02	1.7346E-02	1.7492E-01	1.7492E-01	1.975E-01
TH-234	#B	1.3433E+00	1.3433E+00	4.5511E+00	4.5517E+00	5.056E+00
AM-241	#A	8.7740E-03	8.7741E-03	6.7382E-01	6.7382E-01	7.584E-01

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

----- S U M M A R Y -----
Total Activity (295.2 to 1999.0 keV) 1.3500619E+01 pCi/gm
Total Decayed Activity (295.2 to 1999.0 keV) 1.3500630E+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-13-01-014-F

Spectrum Filename: C:\GammaVision\Spectra\102F_20JUL2006_1701.An1

Acquisition information

Start time: 20-Jul-2006 17:01:18
Live time: 2000
Real time: 2021
Dead time: 1.03 %
Detector ID: 3

Detector system

Det 102 - DSPP-468

Calibration

Filename: D2_1LSa.Clb
DET 102 1 Liter Sand Geometry

Energy Calibration

Created: 15-Jan-2005 03:09:29
Zero offset: 0.220 keV
Gain: 0.500 keV/channel
Quadratic: $-6.435\text{E-}08 \text{ keV/channel}^2$

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: 1.9140E+03
Activity scaling factor: $1.0000\text{E}+06 / (1.0000\text{E}+00 * 1.9140\text{E}+03) = 5.2247\text{E}+02$
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	18-Jul-2006 14:10:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	102_150K_28APR05.Pbc 01-May-2005 05:27:47
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 13 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.7648

***** S U M M A R Y O F P E A 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	124.	35.75	1.50	8.847E-03				
74.80	124.	35.75	1.50	8.847E-03	74.81	9.600	PBC<MDA	PB212
77.22	183.	24.25	1.50	9.541E-03	77.11	10.700	1.269E+00	PB214
					77.11	17.500	7.758E-01	PB212
77.22	183.	24.25	1.50	9.541E-03	77.11	10.700	1.269E+00	PB214
					77.11	17.500	7.758E-01	PB212
186.34	78.	31.43	1.23	1.625E-02	185.99	3.280	PBC<MDA	RA226
239.06	697.	4.49	1.22	1.379E-02	238.63	43.100	8.272E-01	PB212
241.97	108.	23.62	1.22	1.365E-02	241.00	3.900	1.406E+00	RA224
					241.92	7.470	7.442E-01	PB214
277.99	51.	38.36	1.50	1.207E-02	279.17	81.500	PBC<MDA	HG203
295.75	120.	14.04	1.26	1.145E-02	295.22	19.200	3.848E-01	PB214
300.93	39.	37.34	1.26	1.126E-02				
339.17	143.	14.92	1.05	1.004E-02	338.40	12.010	8.357E-01	AC228
352.54	195.	12.19	1.16	9.664E-03	351.99	37.100	3.819E-01	PB214
463.85	45.	32.56	1.50	7.365E-03	463.51	10.000	PBC<MDA	SB125
511.60	70.	22.28	1.22	6.684E-03	510.72	22.500	3.304E-01	TL208
584.14	178.	10.57	1.14	5.880E-03	583.14	86.000	2.478E-01	TL208
610.41	167.	9.51	1.43	5.640E-03	609.32	46.090	4.518E-01	BI214
728.58	70.	25.47	1.54	4.786E-03	727.17	11.800	8.687E-01	BI212
796.64	29.	34.29	1.60	4.420E-03	795.76	85.400	PBC<MDA	CS134
912.65	119.	12.21	1.73	3.916E-03	911.07	29.000	7.348E-01	AC228
969.99	115.	16.69	1.66	3.714E-03				
1121.95	33.	28.64	1.72	3.283E-03	1120.28	15.040	4.690E-01	BI214
1463.11	581.	4.24	2.20	2.617E-03	1460.75	10.700	1.462E+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		
477.76	239.05	141.	697.	0.349	13.47	1.215	PB-212	D	
483.57	241.95	268.	108.	0.054	70.85	1.217	PB-214	D	
601.38	300.86	123.	54.	0.027	104.24	1.471	PB-212		
1941.19	969.99	29.	69.	0.035	48.91	1.719	AC-228	D	

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

This section based on library: FSS_Rev_1.Lib

***** I D E N T I F I E D P E A K S U M M A R Y *****								
Nuclide	Peak	Centroid	Background	Net Area	Intensity	Uncert	FWHM	
	Channel	Energy	Counts	Counts	Cts/Sec	3 Sigma %	keV	
PB-212	149.17	74.80	971.	124.	0.062	107.24	1.500	
PB-214	153.80	77.11	898.	183.	0.092	72.75	1.500D	
PB-212	153.80	77.11	898.	183.	0.092	72.75	1.500D	
RA-226	372.27	186.33	416.	75.	0.037	113.98	1.500s	
PB-212	477.62	238.99	385.	588.	0.294	18.80	1.500	
RA-224	483.12	241.74	406.	82.	0.041	107.39	1.500	
PB-214	483.43	241.90	409.	74.	0.037	121.75	1.500	
HG-203	555.62	277.99	164.	51.	0.025	115.07	1.500s	
PB-214	591.28	295.81	149.	129.	0.064	48.12	1.500	
AC-228	678.01	339.17	120.	143.	0.072	44.75	1.052s	
PB-214	704.76	352.54	105.	184.	0.092	32.23	1.500	
SB-125	927.44	463.85	91.	45.	0.022	97.68	1.500s	
TL-208	1022.97	511.60	70.	70.	0.035	66.84	1.221	
TL-208	1168.11	584.14	61.	178.	0.089	31.70	1.143s	
BI-214	1220.68	610.41	38.	167.	0.083	28.53	1.427	
BI-212	1457.11	728.58	64.	70.	0.035	76.42	1.542	
CS-134	1593.30	796.64	35.	29.	0.014	102.88	1.601s	
AC-228	1825.44	912.65	30.	118.	0.059	36.63	1.735s	
BI-214	2244.30	1121.95	25.	33.	0.016	85.92	1.722	
K-40	2927.19	1463.14	7.	570.	0.285	12.71	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 -	Average	----- Peak -----				
Name Code	Activity	Energy	Activity	Code	MDA Value	
	pCi/gm	keV	pCi/gm		pCi/gm	COMMENTS
BE-7	-9.2092E-02	477.56-9.209E-02	&(	4.816E-01	1.41E-01	G
K-40	1.4341E+01	1460.75 1.434E+01	(P	3.713E-01	6.08E-01	G
MN-54	-5.3278E-03	834.81-5.328E-03	%(P	5.179E-02	1.46E-02	G
CO-57	2.0987E-03	122.07 2.099E-03	&(	6.000E-02	1.78E-02	G K
		136.43-1.271E-01	%	4.387E-01	1.32E-01	G
CO-60	-1.8500E-02	1332.51-1.850E-02	&(P	7.285E-02	2.11E-02	G K
		1173.23-1.757E-03	%	7.702E-02	2.16E-02	G K
Sr-85	-1.2167E-02	514.00-1.217E-02	%(	5.611E-02	1.65E-02	G
Kr-85	-2.7446E+02	513.99-2.745E+02	%(	1.266E+03	3.73E+02	G
Y-88	-2.0809E-03	1836.01-2.081E-03	%(P	3.607E-02	8.59E-03	G K
		898.02 1.279E-02	& P	5.800E-02	1.67E-02	G
NB-94	-6.5110E-04	871.10-6.511E-04	%(	4.997E-02	1.38E-02	G K
		702.50-4.890E-03	&	5.426E-02	1.55E-02	G K
Ag-108M	-3.6331E-03	722.95-3.633E-03	%(	5.748E-02	1.63E-02	G K
		614.37-3.895E-02	% P	7.248E-02	2.21E-02	G
		433.93 1.148E-04	&	4.724E-02	1.35E-02	G
CD-109	2.5859E-02	88.04 2.586E-02	%(P	2.078E+00	6.18E-01	G
SN-113	-9.3586E-03	391.71-9.359E-03	&(	6.760E-02	1.98E-02	G K
		255.04 1.623E-01	%	1.902E+00	5.59E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	9.0311E-02	427.95-2.387E-02	% (P 1.525E-01	4.43E-02	G	K	
		600.77 5.134E-02	& P 1.983E-01	5.77E-02	G		
		636.15-5.745E-02	% P 4.409E-01	1.27E-01	G		
		463.51 4.283E-01	* (P 4.538E-01	1.44E-01	G		
		176.29-4.298E-02	% P 5.492E-01	1.61E-01	G		
I-131	1.5608E-04	364.48 1.561E-04	& (5.809E-02	1.67E-02	G	K	
		636.97-1.145E-01	% 7.977E-01	2.30E-01	G		
		284.29-1.042E-01	% 7.481E-01	2.20E-01	G		
CS-134	2.4103E-02	604.66-2.227E-03	& (5.330E-02	1.52E-02	G	K	
		795.76 5.419E-02	* (5.653E-02	1.86E-02	G		
		569.29-2.573E-02	% 3.169E-01	9.10E-02	G		
		801.84-2.908E-02	% P 5.557E-01	1.55E-01	G		
CS-137	2.5109E-02	661.62 2.511E-02	& (5.402E-02	1.64E-02	G		
CE-139	-5.5689E-03	165.85-5.569E-03	& (P 5.491E-02	1.63E-02	G		
EU-152	7.7704E-03	121.78 7.770E-03	% (P 1.170E-01	3.45E-02	G	K	
		344.30-2.634E-02	% 1.497E-01	4.41E-02	G		
		1408.08 0.000E+00	% 2.130E-01	5.45E-02	G		
		964.00-9.372E-02	% P 4.340E-01	1.25E-01	G		
		1112.07-6.104E-02	% 5.365E-01	1.53E-01	G		
		778.90 5.463E-02	% P 4.218E-01	1.21E-01	G		
EU-154	2.2558E-03	123.10 2.256E-03	% (P 1.127E-01	3.34E-02	G	K	
		1274.80 1.905E-02	& 1.968E-01	5.54E-02	G		
		723.30-3.092E-02	% P 2.705E-01	7.72E-02	G		
		1004.80-8.944E-02	% 3.765E-01	1.10E-01	G		
EU-155	3.5437E-02	86.45 3.544E-02	% (P 1.996E-01	5.95E-02	G	K	
		105.31 1.794E-02	% 2.198E-01	6.53E-02	G		
HG-203	3.7485E-02	279.17 3.748E-02	& (P 4.619E-02	1.44E-02	G	K	
		72.87-6.120E-01	& 2.201E+00	6.63E-01	G		
		70.83 1.458E-01	% 4.520E+00	1.35E+00	G		
		82.50-9.219E-01	& 3.746E+00	1.12E+00	G		

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	2.4782E-01	583.14	2.478E-01	@(P	5.459E-02	2.63E-02	G
		510.72	3.304E-01	+	1.961E-01	7.37E-02	G
PB-212	7.2067E-01	238.63	6.983E-01	(	1.118E-01	4.38E-02	G K
		77.11	7.758E-01	(	6.020E-01	1.88E-01	G
		74.81	1.031E+00	& P	1.230E+00	3.78E-01	G
PB-214	3.7996E-01	351.99	3.627E-01	(P	9.929E-02	3.90E-02	G K
		295.22	4.133E-01	(	1.912E-01	6.63E-02	G
		77.11	1.269E+00	+	9.846E-01	3.08E-01	G
		241.92	5.093E-01	+	6.711E-01	2.07E-01	G
BI-212	8.6866E-01	727.17	8.687E-01	(	5.006E-01	2.22E-01	G K
		1620.56	3.594E-02	% P	7.894E-01	1.07E-01	G
		785.42	1.395E-02	% P	2.659E+00	7.43E-01	G
BI-214	4.5600E-01	609.32	4.518E-01	(	8.565E-02	4.30E-02	G K
		1764.51	3.475E-02	& P	4.120E-01	1.11E-01	G
		1120.28	4.690E-01	(	3.732E-01	1.34E-01	G
RA-224	1.0882E+00	241.00	1.088E+00	&(P	1.277E+00	3.95E-01	G
RA-226	9.8658E-01	185.99	9.866E-01	(P	1.293E+00	3.97E-01	G
AC-228	7.6434E-01	911.07	7.348E-01	@(P	1.743E-01	9.00E-02	G K
		968.90	4.647E-02	% P	3.972E-01	1.14E-01	G
		338.40	8.357E-01	@(	3.141E-01	1.25E-01	G
TH-227	-8.9146E-02	236.00	8.915E-02	%(P	4.839E-01	1.44E-01	G K
		256.25	1.098E-01	%	5.559E-01	1.65E-01	G
PA-234	1.0780E-02	98.44	1.078E-02	%(	2.047E-01	6.07E-02	G K
		946.00	3.366E-02	&	3.090E-01	8.79E-02	G
		131.28	3.784E-02	%	2.437E-01	7.28E-02	G
		94.67	1.699E-01	%	4.315E-01	1.30E-01	G
		883.24	4.745E-02	%	4.361E-01	1.23E-01	G
		926.70	2.498E-02	%	4.811E-01	1.34E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
		569.26-2.939E-02	%		4.598E-01	1.32E-01	G
TH-234	7.6403E-01						
		63.29	7.640E-01	&(P	4.644E+00	1.39E+00	G K
		92.80	9.921E-01	&	2.338E+00	7.07E-01	G
		92.38-1.295E+00	& P	2.379E+00	7.23E-01	G	

AM-241 -1.4018E-01
59.54-1.402E-01 &(6.954E-01 2.08E-01 G
(- This peak used in the nuclide activity average.

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

Nuclide Codes:

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 *****						
		Time of Count	Time Corrected	Uncertainty	3 Sigma	
Nuclide		Activity	Activity	Counting	Total	MDA
		pCi/gm	pCi/gm	pCi/gm	pCi/gm	pCi/gm
BE-7	#A	-8.9594E-02	-9.2092E-02	4.2392E-01	4.2395E-01	4.686E-01
K-40		1.4341E+01	1.4341E+01	1.8234E+00	1.9931E+00	3.713E-01
MN-54	#A	-5.3028E-03	-5.3278E-03	5.0051E-02	5.0052E-02	5.155E-02
CO-57	#B	2.0873E-03	2.0987E-03	5.3495E-02	5.3495E-02	5.967E-02
CO-60	#B	-1.8485E-02	-1.8500E-02	6.4769E-02	6.4777E-02	7.279E-02

Sr-85	#A	-1.1895E-02	-1.2167E-02	4.9612E-02	4.9616E-02	5.486E-02
Kr-85	#A	-2.7445E+02	-2.7446E+02	1.1196E+03	1.1197E+03	1.266E+03
Y-88	#B	-2.0524E-03	-2.0809E-03	2.6327E-02	2.6328E-02	3.558E-02
NB-94	#B	-6.5110E-04	-6.5110E-04	4.1343E-02	4.1343E-02	4.997E-02
Ag-108M	#B	-3.6329E-03	-3.6331E-03	4.8886E-02	4.8886E-02	5.748E-02
CD-109	#A	2.5775E-02	2.5859E-02	1.8550E+00	1.8550E+00	2.072E+00
SN-113	#B	-9.2400E-03	-9.3586E-03	5.9300E-02	5.9303E-02	6.674E-02
SB-125	#B	9.0180E-02	9.0311E-02	9.1278E-02	9.1418E-02	1.522E-01
I-131	#B	1.3002E-04	1.5608E-04	5.0151E-02	5.0151E-02	4.839E-02
CS-134	#B	2.4056E-02	2.4103E-02	2.4798E-02	2.4835E-02	5.319E-02
CS-137	#A	2.5106E-02	2.5109E-02	4.9067E-02	4.9087E-02	5.401E-02
CE-139	#A	-5.5097E-03	-5.5689E-03	5.3135E-02	5.3136E-02	5.433E-02
EU-152	#B	7.7679E-03	7.7704E-03	1.0342E-01	1.0342E-01	1.170E-01
EU-154	#B	2.2547E-03	2.2558E-03	1.0018E-01	1.0018E-01	1.127E-01
EU-155	#B	3.5408E-02	3.5437E-02	1.7856E-01	1.7857E-01	1.994E-01
HG-203	#A	3.6322E-02	3.7485E-02	4.3212E-02	4.3263E-02	4.475E-02
TL-208		2.4782E-01	2.4782E-01	7.8733E-02	7.9952E-02	
PB-212	#	7.2067E-01	7.2067E-01	1.3547E-01	1.4137E-01	1.118E-01
PB-214	#	3.7996E-01	3.7996E-01	1.1010E-01	1.1214E-01	9.929E-02
BI-212		8.6866E-01	8.6866E-01	6.6382E-01	6.6560E-01	
BI-214		4.5600E-01	4.5600E-01	1.3011E-01	1.3260E-01	
RA-224	#A	1.0882E+00	1.0882E+00	1.1851E+00	1.1866E+00	1.277E+00
RA-226	#A	9.8658E-01	9.8658E-01	1.1918E+00	1.1931E+00	1.293E+00
AC-228	#	7.6434E-01	7.6434E-01	2.2119E-01	2.2531E-01	
TH-227	#B	-8.9146E-02	-8.9146E-02	4.4613E-01	4.4616E-01	4.839E-01
PA-234	#B	1.0780E-02	1.0780E-02	1.8208E-01	1.8208E-01	2.047E-01
TH-234	#B	7.6403E-01	7.6403E-01	4.1669E+00	4.1671E+00	4.644E+00
AM-241	#A	-1.4018E-01	-1.4018E-01	6.2496E-01	6.2501E-01	6.954E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
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) 1.6677416E+01 pCi/gm
Total Decayed Activity (1119.8 to 1999.0 keV) 1.6677416E+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-13-01-012-F

Spectrum Filename: C:\GammaVision\Spectra\103F_19JUL2006_1845.An1

Acquisition information

Start time: 19-Jul-2006 18:45:31
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: 1.0580E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.0580E+03) =
 9.4518E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	17-Jul-2006 11:25:00
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. 17 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.0743

***** S U M M A R Y O F P E A 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	55.	35.83	0.99	9.052E-03	70.83	3.520	2.868E+00	HG203
					74.81	9.600	PBC<MDA	PB212
77.21	98.	19.34	0.99	1.011E-02	77.11	17.500	9.713E-01	PB212
					77.11	10.700	1.589E+00	PB214
92.99	91.	24.39	1.00	1.666E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
					94.67	15.500	4.367E-01	PA234
123.93	71.	40.03	1.51	2.373E-02	121.78	29.240	PBC<MDA	EU152
					122.07	85.600	PBC<MDA	CO57
					123.10	40.460	9.469E-02	EU154
186.24	151.	21.51	1.04	2.566E-02	185.99	3.280	2.097E+00	RA226
208.92	80.	31.64	0.87	2.473E-02				
238.88	689.	4.43	1.09	2.319E-02	238.63	43.100	8.653E-01	PB212
242.03	112.	18.91	1.10	2.302E-02	241.00	3.900	1.586E+00	RA224
					241.92	7.470	8.296E-01	PB214
270.34	60.	31.04	1.08	2.151E-02				
294.89	191.	13.84	1.05	2.026E-02	295.22	19.200	6.149E-01	PB214
300.32	79.	26.01	1.21	2.000E-02				
338.21	164.	16.84	1.07	1.831E-02	338.40	12.010	9.467E-01	AC228
351.93	314.	7.55	1.22	1.776E-02	351.99	37.100	5.980E-01	PB214
463.01	43.	39.43	0.58	1.426E-02				
463.01	43.	39.43	0.58	1.426E-02	463.51	10.000	PBC<MDA	SB125
510.95	134.	16.22	1.18	1.317E-02	510.72	22.500	4.647E-01	TL208
583.22	273.	9.31	1.35	1.184E-02	583.14	86.000	3.369E-01	TL208
609.34	231.	7.69	1.20	1.144E-02	609.32	46.090	5.447E-01	BI214
661.71	118.	13.09	1.68	1.072E-02	661.62	84.620	1.645E-01	CS137
727.23	55.	27.15	1.18	9.964E-03	727.17	11.800	5.921E-01	BI212

795.16	38.	33.08	1.27	9.307E-03				
795.16	38.	33.08	1.27	9.307E-03	795.76	85.400	6.109E-02	CS134
860.59	61.	23.08	1.74	8.767E-03				
910.92	147.	10.25	1.30	8.402E-03	911.07	29.000	7.509E-01	AC228
964.36	32.	27.93	1.54	8.053E-03	964.00	14.580	3.387E-01	EU152

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
969.12	97.	11.96	1.54	8.024E-03	968.90	17.460	8.784E-01	AC228
1120.53	65.	24.01	1.12	7.212E-03	1120.28	15.040	7.632E-01	BI214
1460.88	706.	3.84	1.82	5.932E-03	1460.75	10.700	1.383E+01	K40
1764.56	50.	14.08	1.32	5.142E-03	1764.51	15.920	7.853E-01	BI214

***** 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

247.04	123.93	305.	71.	0.035	120.09	1.515 EU-154 l
417.00	208.92	243.	80.	0.040	94.92	0.868 AC-228 s
539.82	270.34	139.	60.	0.030	93.12	1.082 AC-228 s
599.79	300.32	133.	79.	0.040	78.04	1.207 PB-212
925.15	463.01	90.	43.	0.021	118.30	0.581 AC-228 l
1720.22	860.59	44.	61.	0.030	69.25	1.737 TL-208 s
1928.21	964.40	23.	32.	0.016	83.80	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	Centroid	Background	Net Area	Intensity	Uncert	FWHM
	Channel	Energy	Counts	Counts	Cts/Sec	3 Sigma %	keV

PB-212	148.79	74.81	189.	55.	0.027	107.50	0.993D
PB-212	153.39	77.11	193.	98.	0.049	58.01	0.995A
TH-234	185.03	92.93	486.	93.	0.046	87.86	1.500s
TH-234	184.98	92.90	456.	94.	0.047	84.36	1.500s
PA-234	184.94	92.88	328.	121.	0.060	69.12	1.500s
RA-226	371.46	186.15	405.	100.	0.050	79.70	1.500s
PB-212	476.92	238.88	339.	701.	0.351	16.46	0.940
RA-224	482.05	241.45	429.	94.	0.047	98.26	1.500s
PB-214	483.52	242.18	442.	85.	0.043	109.40	1.500
PB-214	588.92	294.89	186.	187.	0.094	41.52	1.055s
AC-228	675.57	338.21	188.	163.	0.081	50.51	1.066s
PB-214	703.00	351.93	105.	308.	0.154	22.64	1.219s
TL-208	1021.01	510.95	130.	108.	0.054	48.67	1.184s
TL-208	1165.53	583.22	102.	269.	0.134	27.92	1.345
BI-214	1217.78	609.34	47.	225.	0.112	23.08	1.201
CS-137	1322.50	661.71	43.	117.	0.058	39.27	1.681s
BI-212	1453.53	727.23	56.	55.	0.027	81.45	1.183
CS-134	1589.06	795.00	28.	31.	0.015	89.98	1.500

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
AC-228	1820.87	910.92	34.	143.	0.072	30.74	1.304s
EU-152	1927.95	964.47	33.	29.	0.014	99.76	1.538s
AC-228	1936.81	968.90	19.	96.	0.048	35.88	1.541D
BI-214	2240.03	1120.53	53.	65.	0.032	72.04	1.123s
K-40	2920.63	1460.88	29.	687.	0.344	11.53	1.816
BI-214	3527.87	1764.56	5.	50.	0.025	42.24	1.320s

s - Peak fails shape tests.

D - Peak area deconvoluted.

A Derived peak area.

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

- Nuclide -	Average	----- Peak -----	
Name	Code	Activity	Energy
		pCi/gm	keV
			Activity
			pCi/gm
			Code
			MDA
			Value
			pCi/gm
			COMMENTS

BE-7	3.9072E-02	477.56	3.907E-02	% (	4.558E-01	1.32E-01	G
K-40	1.3830E+01	1460.75	1.383E+01	(P	5.571E-01	5.46E-01	G
MN-54	1.4877E-02	834.81	1.488E-02	&(P	4.206E-02	1.24E-02	G
CO-57	3.0685E-02	122.07	3.069E-02	&(P	5.492E-02	1.67E-02	G K
		136.43	1.544E-02	%	5.227E-01	1.55E-01	G
CO-60	-5.3297E-03	1332.51	-5.330E-03	&(P	5.109E-02	1.31E-02	G K
		1173.23	2.127E-02	% P	6.517E-02	1.91E-02	G K
Sr-85	-1.7056E-02	514.00	-1.706E-02	&(	6.197E-02	1.84E-02	G
Kr-85	-3.8418E+02	513.99	-3.842E+02	&(	1.396E+03	4.16E+02	G
Y-88	2.8570E-04	1836.01	2.857E-04	%(P	3.786E-02	9.35E-03	G K
		898.02	-1.348E-03	& P	4.803E-02	1.31E-02	G
NB-94	1.0844E-03	871.10	1.084E-03	&(	4.657E-02	1.30E-02	G K
		702.50	0.000E+00	%	5.482E-02	1.56E-02	G K

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
Ag-108M	1.2140E-02	722.95	1.214E-02	% (	4.736E-02	1.38E-02	G K
		614.37	1.866E-02	% P	4.470E-02	1.34E-02	G
		433.93	0.000E+00	%	5.217E-02	1.51E-02	G
CD-109	6.4306E-01	88.04	6.431E-01	& (	2.138E+00	6.42E-01	G
SN-113	-1.0658E-02	391.71	-1.066E-02	% (	6.787E-02	1.99E-02	G K
		255.04	3.417E-01	&	2.081E+00	6.16E-01	G
SB-125	-2.4271E-02	427.95	-2.427E-02	& (P	1.491E-01	4.37E-02	G K
		600.77	-1.324E-02	& P	2.794E-01	8.03E-02	G
		636.15	-5.138E-02	% P	4.038E-01	1.16E-01	G
		463.51	2.397E-01	% P	4.021E-01	1.23E-01	G
		176.29	9.965E-02	%	6.971E-01	2.07E-01	G
I-131	-8.4330E-03	364.48	-8.433E-03	% (P	6.035E-02	1.76E-02	G K
		636.97	3.659E-03	%	6.253E-01	1.74E-01	G
		284.29	8.649E-02	% P	7.874E-01	2.31E-01	G
CS-134	-2.8447E-02	604.66	-2.845E-02	% (	6.043E-02	1.83E-02	G K
		795.76	4.992E-02	+ P	4.408E-02	1.50E-02	G
		569.29	-3.278E-02	% P	2.771E-01	7.84E-02	G
		801.84	-7.055E-02	% P	5.140E-01	1.43E-01	G
CS-137	1.6447E-01	661.62	1.645E-01	(P	4.693E-02	2.18E-02	G
CE-139	2.2707E-02	165.85	2.271E-02	% (	5.974E-02	1.80E-02	G
EU-152	1.6336E-01	121.78	8.861E-02	& (P	1.603E-01	4.88E-02	G K
		344.30	4.591E-04	% P	1.491E-01	4.31E-02	G
		1408.08	7.989E-02	%	2.218E-01	6.55E-02	G
		964.00	3.133E-01	*(P	3.228E-01	1.06E-01	G
		1112.07	1.522E-02	&	3.904E-01	1.09E-01	G
		778.90	9.008E-02	%	2.834E-01	8.33E-02	G
EU-154	6.5838E-02	123.10	6.584E-02	% (	1.211E-01	3.69E-02	G K
		1274.80	-1.504E-02	&	1.380E-01	3.85E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
		723.30	6.901E-03	%	4.202E-01	1.22E-01	G
		1004.80	7.803E-02	%	2.592E-01	7.59E-02	G
EU-155	2.0627E-01						
		86.45	2.063E-01	%(	3.017E-01	9.24E-02	G K
		105.31	1.037E-01	%	3.014E-01	9.08E-02	G
HG-203	-1.2000E-02						
		279.17	-1.200E-02	%(P	5.729E-02	1.70E-02	G K
		72.87	-1.056E+00	% P	2.957E+00	8.91E-01	G
		70.83	3.832E-02	%	4.654E+00	1.37E+00	G
		82.50	-1.289E+00	%	5.321E+00	1.60E+00	G
TL-208	3.3691E-01						
		583.14	3.369E-01	(P	6.250E-02	3.19E-02	G
		510.72	4.647E-01	+ P	2.408E-01	9.40E-02	G
PB-212	9.0206E-01						
		238.63	8.955E-01	(P	1.131E-01	5.00E-02	G K
							Energy duplication
		77.11	7.062E-01	} P	4.872E-01	1.37E-01	G
		74.81	8.052E-01	(P	9.820E-01	3.05E-01	G
PB-214	6.0733E-01						
		351.99	5.980E-01	@(P	9.770E-02	4.59E-02	G K
		295.22	6.149E-01	@(P	2.176E-01	8.69E-02	G
							Energy duplication
		77.11	1.600E-01	} P	1.139E+00	3.12E-01	G
		241.92	6.344E-01	(	7.481E-01	2.31E-01	G
BI-212	5.9207E-01						
		727.17	5.921E-01	(P	4.099E-01	1.62E-01	G K
		1620.56	5.349E-01	% P	1.108E+00	3.41E-01	G
		785.42	-3.576E-01	%	2.101E+00	6.02E-01	G
BI-214	5.4466E-01						
		609.32	5.447E-01	(P	8.410E-02	4.31E-02	G K
		1764.51	7.853E-01	+ P	1.995E-01	1.18E-01	G
		1120.28	7.632E-01	+ P	4.321E-01	1.89E-01	G
RA-224	1.3375E+00						
		241.00	1.338E+00	&(	1.409E+00	4.38E-01	G
RA-226	1.5143E+00						
		185.99	1.514E+00	*(P	1.464E+00	4.55E-01	G
AC-228	8.2918E-01						
		911.07	7.509E-01	@(P	1.562E-01	7.87E-02	G K
		968.90	8.784E-01	(P	2.074E-01	1.05E-01	G
		338.40	9.467E-01	@(P	3.871E-01	1.60E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TH-227	-3.2394E-01						
		236.00	3.239E-01	%(	5.611E-01	1.71E-01	G K
		256.25	7.541E-02	% P	6.694E-01	1.98E-01	G
PA-234	2.1844E-01						
		98.44	5.722E-03	%(P	3.154E-01	9.34E-02	G K
		946.00	4.861E-03	& P	2.822E-01	7.94E-02	G
		131.28	7.274E-02	& P	2.539E-01	7.61E-02	G
		94.67	5.814E-01	?(P	4.200E-01	1.34E-01	G
		883.24	7.775E-02	&	4.260E-01	1.23E-01	G
		926.70	0.000E+00	%	4.529E-01	1.26E-01	G
		569.26	4.552E-02	% P	4.096E-01	1.16E-01	G
TH-234	2.0440E+00						
		63.29	1.223E+00	%(P	8.781E+00	2.61E+00	G K
		92.80	2.437E+00	@(P	2.646E+00	8.14E-01	G
		92.38	2.831E+00	&(P	3.215E+00	9.87E-01	G

AM-241 3.7951E-01 59.54 3.795E-01 %(P 1.470E+00 4.40E-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:

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

Peak Codes:

G - Gamma Ray
X - X-Ray
P - Positron Decay
S - Single-Escape
D - Double-Escape
K - Key Line
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 *****					
Time of Count		Time Corrected	Uncertainty	3 Sigma	
Nuclide	Activity	Activity	Counting	Total	MDA
	pCi/gm	pCi/gm	pCi/gm	pCi/gm	pCi/gm
BE-7 #A	3.7920E-02	3.9072E-02	3.9643E-01	3.9644E-01	4.424E-01
K-40	1.3830E+01	1.3830E+01	1.6378E+00	1.8240E+00	
MN-54 #A	1.4802E-02	1.4877E-02	3.7328E-02	3.7338E-02	4.184E-02
CO-57 #B	3.0504E-02	3.0685E-02	5.0202E-02	5.0231E-02	5.460E-02
CO-60 #B	-5.3253E-03	-5.3297E-03	2.0724E-01	2.0724E-01	5.105E-02
Sr-85 #A	-1.6641E-02	-1.7056E-02	5.5349E-02	5.5358E-02	6.046E-02
Kr-85 #A	-3.8417E+02	-3.8418E+02	1.2467E+03	1.2469E+03	1.396E+03
Y-88 #B	2.8145E-04	2.8570E-04	2.8059E-02	2.8059E-02	3.729E-02
NB-94 #B	1.0844E-03	1.0844E-03	3.8957E-02	3.8957E-02	4.657E-02
Ag-108M#B	1.2140E-02	1.2140E-02	4.1537E-02	4.1543E-02	4.736E-02
CD-109 #A	6.4079E-01	6.4306E-01	1.9250E+00	1.9254E+00	2.131E+00
SN-113 #B	-1.0511E-02	-1.0658E-02	5.9740E-02	5.9743E-02	6.693E-02
SB-125 #B	-2.4233E-02	-2.4271E-02	1.3223E-01	1.3223E-01	1.488E-01
I-131 #B	-6.9127E-03	-8.4330E-03	6.3239E-02	6.3241E-02	4.947E-02
CS-134 #B	-2.8387E-02	-2.8447E-02	5.4928E-02	5.4953E-02	6.030E-02
CS-137	1.6444E-01	1.6447E-01	6.5357E-02	6.6050E-02	
CE-139 #A	2.2445E-02	2.2707E-02	5.4046E-02	5.4062E-02	5.905E-02
EU-152 #F	1.6330E-01	1.6336E-01	1.5846E-01	1.5872E-01	1.603E-01
EU-154 #B	6.5804E-02	6.5838E-02	1.1056E-01	1.1062E-01	1.210E-01
EU-155 #B	2.0609E-01	2.0627E-01	2.7730E-01	2.7754E-01	3.015E-01
HG-203 #B	-1.1596E-02	-1.2000E-02	5.1325E-02	5.1330E-02	5.536E-02
TL-208	3.3691E-01	3.3691E-01	9.5564E-02	9.7545E-02	
PB-212	9.0206E-01	9.0206E-01	1.5102E-01	1.5984E-01	
PB-214	6.0733E-01	6.0733E-01	1.4001E-01	1.4438E-01	
BI-212	5.9207E-01	5.9207E-01	4.8664E-01	4.8785E-01	
BI-214	5.4466E-01	5.4466E-01	1.2935E-01	1.3316E-01	
RA-224 #A	1.3375E+00	1.3375E+00	1.3142E+00	1.3165E+00	1.409E+00
RA-226 #	1.5143E+00	1.5143E+00	1.3635E+00	1.3664E+00	1.464E+00
AC-228	8.2918E-01	8.2918E-01	1.9281E-01	1.9873E-01	
TH-227 #B	-3.2394E-01	-3.2394E-01	5.1287E-01	5.1321E-01	5.611E-01
PA-234 #B	2.1844E-01	2.1844E-01	1.5142E-01	1.5190E-01	3.154E-01
TH-234 #B	2.0440E+00	2.0440E+00	2.0475E+00	2.0506E+00	8.781E+00
AM-241 #A	3.7951E-01	3.7951E-01	1.3204E+00	1.3205E+00	1.470E+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) 1.7806929E+01 pCi/gm
Total Decayed Activity (1120.0 to 2000.7 keV) 1.7806953E+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-13-01-010-F

Spectrum Filename: C:\GammaVision\Spectra\103F_19JUL2006_1922.An1

Acquisition information

Start time: 19-Jul-2006 19:22:35
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: 2.0180E+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	17-Jul-2006 11:05:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	103_150K_05AUG05.Pbc 08-Aug-2005 12:54:15
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 19 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.0729

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

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
74.89	154.	19.73	0.99	9.052E-03	74.81	9.600	1.184E+00	PB212
77.19	209.	12.97	0.99	1.011E-02	77.11	10.700	1.313E+00	PB214
					77.11	17.500	8.030E-01	PB212
92.99	118.	34.24	1.50	1.645E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
92.99	117.	35.00	1.50	1.631E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
129.60	110.	38.75	1.00	2.443E-02				
186.48	159.	24.39	1.15	2.565E-02	185.99	3.280	1.165E+00	RA226
209.06	135.	27.02	0.73	2.472E-02				
238.86	1289.	3.22	1.09	2.319E-02	238.63	43.100	8.555E-01	PB212
241.95	182.	15.56	1.10	2.303E-02	241.00	3.900	1.358E+00	RA224
					241.92	7.470	7.105E-01	PB214
270.56	150.	22.50	1.50	2.149E-02				
277.49	63.	40.89	1.31	2.114E-02				
277.49	63.	40.89	1.31	2.114E-02	279.17	81.500	PBC<MDA	HG203
295.23	243.	13.68	1.17	2.025E-02	295.22	19.200	4.112E-01	PB214
300.53	74.	29.23	1.08	1.999E-02				
328.07	100.	30.17	1.11	1.874E-02				
338.45	324.	10.19	1.35	1.830E-02	338.40	12.010	9.835E-01	AC228
351.96	414.	9.45	1.25	1.775E-02	351.99	37.100	4.151E-01	PB214
462.94	90.	23.77	1.37	1.426E-02				
462.94	90.	23.77	1.37	1.426E-02	463.51	10.000	4.177E-01	SB125
510.72	192.	14.15	1.40	1.317E-02	510.72	22.500	3.735E-01	TL208
583.24	488.	7.12	1.32	1.184E-02	583.14	86.000	3.177E-01	TL208
609.23	322.	8.81	1.30	1.144E-02	609.32	46.090	4.002E-01	BI214
661.75	41.	39.57	1.50	1.072E-02	661.62	84.620	PBC<MDA	CS137

727.01	121.	17.22	1.72	9.966E-03	727.17	11.800	6.846E-01	BI212
785.47	40.	34.92	1.50	9.394E-03	785.42	2.000	PBC<MDA	BI212
794.69	82.	25.43	1.17	9.311E-03				
794.69	82.	25.43	1.17	9.311E-03	795.76	85.400	6.904E-02	CS134
859.73	94.	17.65	1.31	8.774E-03				
911.13	307.	9.13	1.48	8.401E-03	911.07	29.000	8.346E-01	AC228
968.85	240.	11.83	1.59	8.026E-03	968.90	17.460	1.144E+00	AC228
1120.76	97.	21.19	2.07	7.210E-03	1120.28	15.040	5.878E-01	BI214

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
1460.82	1472.	2.71	2.04	5.932E-03	1460.75	10.700	1.533E+01	K40
1619.83	29.	27.80	1.97	5.488E-03	1620.56	2.750	1.285E+00	BI212
1764.30	73.	14.32	0.84	5.142E-03	1764.51	15.920	5.999E-01	BI214

***** 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 %	Suspected Nuclide
417.28	209.06	520.	135.	0.068	81.07	0.729	AC-228 s
540.26	270.56	379.	150.	0.075	67.49	1.504	AC-228 s
600.20	300.53	197.	74.	0.037	87.70	1.083	PB-212
655.29	328.07	303.	100.	0.050	90.50	1.107	AC-228 s
1718.50	859.73	59.	94.	0.047	52.95	1.310	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 %
PB-212	148.79	74.81	403.	154.	0.077	59.20	0.993D
PB-212	153.39	77.11	418.	209.	0.104	38.92	0.995A
TH-234	185.15	92.99	1058.	117.	0.058	104.99	1.500
TH-234	185.15	92.99	1034.	118.	0.059	102.72	1.500
RA-226	371.47	186.15	800.	163.	0.081	71.49	1.500s
PB-212	476.42	238.63	230.	1280.	0.640	9.65	1.093D
RA-224	481.16	241.00	1154.	123.	0.062	121.09	1.095D
PB-214	483.00	241.92	367.	109.	0.054	65.03	1.095A
HG-203	554.15	277.50	336.	65.	0.033	124.37	1.500s
PB-214	589.60	295.23	335.	239.	0.119	41.05	1.170
AC-228	676.05	338.45	265.	323.	0.161	30.58	1.351s
PB-214	703.06	351.96	344.	408.	0.204	28.35	1.251
SB-125	925.09	462.98	158.	91.	0.045	65.75	1.500s
TL-208	1020.55	510.72	209.	165.	0.083	42.45	1.403s
TL-208	1165.58	583.24	199.	483.	0.242	21.37	1.318
BI-214	1217.55	609.23	162.	315.	0.158	26.44	1.305
CS-137	1322.58	661.75	119.	41.	0.020	118.71	1.500
BI-212	1453.08	727.01	95.	120.	0.060	51.65	1.721s
BI-212	1570.00	785.47	79.	40.	0.020	104.76	1.500
CS-134	1588.83	794.89	73.	50.	0.025	84.19	1.500s
AC-228	1821.29	911.13	129.	304.	0.152	27.39	1.481

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
AC-228	1936.71	968.85	135.	239.	0.120	35.50	1.587
BI-214	2240.50	1120.76	101.	95.	0.048	63.58	2.066s
K-40	2920.51	1460.82	42.	1453.	0.726	8.12	2.042
BI-212	3238.47	1619.83	9.	29.	0.014	83.40	1.968s
BI-214	3527.36	1764.30	12.	73.	0.037	42.95	0.843s

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

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

- Nuclide -	Average	----- Peak -----	
Name	Code	Activity	Energy
		pCi/gm	keV
			Activity
			pCi/gm
			Code
			MDA
			Value
			pCi/gm
			COMMENTS

BE-7	1.0141E-01	477.56	1.014E-01	&(	3.009E-01	9.01E-02	G
K-40	1.5328E+01	1460.75	1.533E+01	(P	3.477E-01	4.20E-01	G
MN-54	1.3687E-02	834.81	1.369E-02	%(P	3.516E-02	1.05E-02	G
CO-57	-5.1365E-04	122.07-5.137E-04	&(P	4.842E-02	1.44E-02	G	K
		136.43-6.000E-02	%	3.932E-01	1.18E-01	G	
CO-60	-5.4690E-04	1332.51-5.469E-04	%(P	3.172E-02	8.56E-03	G	K
		1173.23-8.772E-03	% P	4.580E-02	1.32E-02	G	K
Sr-85	-1.8531E-02	514.00-1.853E-02	&(	4.373E-02	1.32E-02	G	
Kr-85	-4.1739E+02	513.99-4.174E+02	&(	9.845E+02	2.97E+02	G	
Y-88	2.1519E-04	1836.01 2.152E-04	%(P	2.349E-02	6.02E-03	G	K
		898.02 1.208E-02	% P	2.777E-02	8.34E-03	G	
NB-94	3.6768E-04	871.10 3.677E-04	%(	3.226E-02	9.17E-03	G	K
		702.50-6.061E-03	%	3.506E-02	1.03E-02	G	K

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
Ag-108M	-2.2474E-02	722.95	2.247E-02	% (	4.510E-02	1.37E-02	G K
		614.37	1.466E-03	% P	3.467E-02	1.00E-02	G
		433.93	9.860E-04	&	3.159E-02	9.21E-03	G
CD-109	9.3989E-01	88.04	9.399E-01	% (	1.837E+00	5.58E-01	G
SN-113	7.4250E-04	391.71	7.425E-04	% (	5.161E-02	1.51E-02	G K
		255.04	3.195E-01	&	1.505E+00	4.50E-01	G
SB-125	9.8882E-02	427.95	1.176E-02	& (P	9.712E-02	2.86E-02	G K
		600.77	6.917E-02	% P	1.827E-01	5.49E-02	G
		636.15	4.407E-02	& P	2.764E-01	8.08E-02	G
		463.51	4.264E-01	@ (P	2.885E-01	9.48E-02	G
		176.29	2.467E-02	%	4.723E-01	1.40E-01	G
I-131	5.6060E-03	364.48	5.606E-03	% (P	4.308E-02	1.27E-02	G K
		636.97	2.630E-02	&	5.591E-01	1.62E-01	G
		284.29	1.392E-01	% P	5.764E-01	1.72E-01	G
CS-134	1.0998E-02	604.66	1.609E-02	% (	4.237E-02	1.28E-02	G K
		795.76	4.196E-02	* (P	3.585E-02	1.18E-02	G
		569.29	5.728E-02	& P	1.948E-01	5.78E-02	G
		801.84	1.620E-02	% P	3.902E-01	1.11E-01	G
CS-137	3.0096E-02	661.62	3.010E-02	(P	3.960E-02	1.23E-02	G
CE-139	9.7666E-03	165.85	9.767E-03	& (	4.502E-02	1.35E-02	G
EU-152	-5.0491E-02	121.78	5.049E-02	& (P	1.416E-01	4.27E-02	G K
		344.30	3.862E-02	% P	1.087E-01	3.27E-02	G
		1408.08	5.957E-02	&	1.313E-01	3.97E-02	G
		964.00	1.505E-01	% P	2.977E-01	9.04E-02	G
		1112.07	8.088E-02	&	2.706E-01	8.01E-02	G
		778.90	2.654E-02	%	2.629E-01	7.62E-02	G
EU-154	2.4313E-02	123.10	2.431E-02	% (	1.054E-01	3.17E-02	G K
		1274.80	2.594E-02	%	8.889E-02	2.61E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
		723.30	3.618E-03	%	2.979E-01	8.77E-02	G
		1004.80	2.230E-02	&	2.116E-01	6.11E-02	G
EU-155	-6.5111E-03						
		86.45	6.511E-03	%(	1.903E-01	5.66E-02	G K
		105.31	7.828E-02	%	2.188E-01	6.60E-02	G
HG-203	2.6465E-02						
		279.17	2.647E-02	&(P	3.563E-02	1.10E-02	G K
		72.87	1.906E-01	% P	1.757E+00	5.24E-01	G
		70.83	2.257E-02	&	3.993E+00	1.19E+00	G
		82.50	7.201E-01	&	3.559E+00	1.07E+00	G
TL-208	3.2929E-01						
		583.14	3.177E-01	(P	4.496E-02	2.28E-02	G
		510.72	3.735E-01	*(P	1.582E-01	6.14E-02	G
PB-212	8.4174E-01						
		238.63	8.575E-01	(P	4.920E-02	2.79E-02	G K
							Energy duplication
		77.11	7.906E-01	} P	3.706E-01	1.03E-01	G
		74.81	1.184E+00	+ P	7.421E-01	2.38E-01	G
PB-214	4.2329E-01						
		351.99	4.151E-01	(P	9.060E-02	3.98E-02	G K
		295.22	4.112E-01	(P	1.516E-01	5.72E-02	G
							Energy duplication
		77.11	0.000E+00	} P	9.021E-01	0.00E+00	G
		241.92	4.233E-01	}	3.581E-01	9.18E-02	G
BI-212	6.8458E-01						
		727.17	6.846E-01	*(P	2.738E-01	1.18E-01	G K
		1620.56	1.285E+00	+ P	7.421E-01	3.58E-01	G
		785.42	1.438E+00	+	1.573E+00	5.02E-01	G
BI-214	4.0025E-01						
		609.32	4.002E-01	(P	7.875E-02	3.60E-02	G K
		1764.51	5.999E-01	+ P	1.524E-01	8.97E-02	G
		1120.28	5.878E-01	+ P	3.056E-01	1.27E-01	G
RA-224	9.1889E-01						
							Derived Ave Activity
		241.00	9.189E-01	}(	1.199E+00	3.79E-01	G
RA-226	1.2931E+00						
		185.99	1.293E+00	(P	1.070E+00	3.33E-01	G
AC-228	8.7817E-01						
		911.07	8.346E-01	(P	1.531E-01	7.71E-02	G K
		968.90	1.144E+00	+ P	2.713E-01	1.36E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
		338.40	9.835E-01	*(P	2.395E-01	1.01E-01	G
TH-227	-6.0951E-02						
		236.00	-6.095E-02	&(	2.944E-01	8.81E-02	G K
		256.25	9.290E-02	% P	4.562E-01	1.36E-01	G
PA-234	-2.4516E-02						
		98.44	-2.452E-02	%(P	2.117E-01	6.33E-02	G K
		946.00	-2.856E-02	% P	1.857E-01	5.41E-02	G
		131.28	7.248E-04	& P	2.154E-01	6.42E-02	G
		94.67	-1.530E-01	% P	4.099E-01	1.24E-01	G
		883.24	1.732E-02	&	2.803E-01	8.04E-02	G
		926.70	4.269E-02	%	2.782E-01	8.04E-02	G
		569.26	8.480E-02	& P	2.884E-01	8.55E-02	G
TH-234	1.0621E+00						
		63.29	1.128E-01	&(P	6.277E+00	1.87E+00	G K
		92.80	1.606E+00	(P	2.070E+00	6.32E-01	G
		92.38	1.867E+00	(P	2.466E+00	7.52E-01	G

AM-241 -6.8032E-02
59.54-6.803E-02 %(P 1.136E+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:

T - Thermal Neutron Activation
F - Fast Neutron Activation
I - Fission Product
N - Naturally Occurring Isotope
P - Photon Reaction
C - Charged Particle Reaction

Peak Codes:

G - Gamma Ray
X - X-Ray
P - Positron Decay
S - Single-Escape
D - Double-Escape
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 *****						
Time of Count		Time Corrected		Uncertainty		3 Sigma
Nuclide	Activity	Activity	Activity	Counting	Total	MDA
	pCi/gm	pCi/gm	pCi/gm	pCi/gm	pCi/gm	pCi/gm
BE-7 #A	9.8371E-02	1.0141E-01	2.7032E-01	2.7038E-01	2.919E-01	
K-40	1.5328E+01	1.5328E+01	1.2606E+00	1.5431E+00		
MN-54 #A	1.3616E-02	1.3687E-02	3.1630E-02	3.1640E-02	3.498E-02	
CO-57 #B	-5.1057E-04	-5.1365E-04	7.7172E-02	7.7172E-02	4.812E-02	
CO-60 #B	-5.4644E-04	-5.4690E-04	3.8157E-02	3.8157E-02	3.170E-02	
Sr-85 #A	-1.8072E-02	-1.8531E-02	3.9636E-02	3.9651E-02	4.265E-02	
Kr-85 #A	-4.1738E+02	-4.1739E+02	8.9242E+02	8.9275E+02	9.845E+02	
Y-88 #B	2.1194E-04	2.1519E-04	1.8048E-02	1.8048E-02	2.314E-02	
NB-94 #B	3.6768E-04	3.6768E-04	2.7514E-02	2.7514E-02	3.226E-02	
Ag-108M#B	-2.2473E-02	-2.2474E-02	4.1102E-02	4.1123E-02	4.510E-02	
CD-109 #A	9.3652E-01	9.3989E-01	1.6738E+00	1.6746E+00	1.831E+00	
SN-113 #B	7.3209E-04	7.4250E-04	4.5435E-02	4.5435E-02	5.089E-02	
SB-125 #F	9.8723E-02	9.8882E-02	6.5932E-02	6.6181E-02	9.696E-02	
I-131 #B	4.5797E-03	5.6060E-03	3.8142E-02	3.8144E-02	3.519E-02	
CS-134 #B	1.0975E-02	1.0998E-02	9.2757E-03	9.2976E-03	4.228E-02	
CS-137 #A	3.0092E-02	3.0096E-02	3.6943E-02	3.6984E-02	3.959E-02	
CE-139 #A	9.6518E-03	9.7666E-03	4.0536E-02	4.0540E-02	4.449E-02	
EU-152 #B	-5.0473E-02	-5.0491E-02	1.3298E-01	1.3301E-01	1.415E-01	
EU-154 #B	2.4300E-02	2.4313E-02	9.4999E-02	9.5009E-02	1.053E-01	
EU-155 #B	-6.5053E-03	-6.5111E-03	1.6993E-01	1.6993E-01	1.901E-01	
HG-203 #A	2.5558E-02	2.6465E-02	3.2934E-02	3.2970E-02	3.441E-02	
TL-208	3.2929E-01	3.2929E-01	7.1010E-02	7.3539E-02		
PB-212	8.4174E-01	8.4174E-01	8.2022E-02	9.5477E-02		
PB-214	4.2329E-01	4.2329E-01	1.2108E-01	1.2354E-01		
BI-212	6.8458E-01	6.8458E-01	3.5506E-01	3.5728E-01		
BI-214	4.0025E-01	4.0025E-01	1.0800E-01	1.1047E-01		
RA-224 A	9.1889E-01	9.1889E-01	1.1127E+00	1.1139E+00		
RA-226 #	1.2931E+00	1.2931E+00	9.9815E-01	1.0010E+00	1.070E+00	
AC-228	8.7817E-01	8.7817E-01	1.8148E-01	1.8851E-01		
TH-227 #B	-6.0951E-02	-6.0951E-02	2.6441E-01	2.6443E-01	2.944E-01	
PA-234 #B	-2.4516E-02	-2.4516E-02	2.1363E-01	2.1363E-01	2.117E-01	
TH-234 #B	1.0621E+00	1.0621E+00	1.2536E+00	1.2550E+00	6.277E+00	
AM-241 #A	-6.8031E-02	-6.8032E-02	1.0664E+00	1.0664E+00	1.136E+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 - Half-life limit exceeded

----- S U M M A R Y -----
Total Activity (247.4 to 2000.7 keV) 1.9804407E+01 pCi/gm
Total Decayed Activity (247.4 to 2000.7 keV) 1.9804407E+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-13-01-005-F

Spectrum Filename: C:\GammaVision\Spectra\103F_19JUL2006_1959.An1

Acquisition information

Start time: 19-Jul-2006 19:59:19
Live time: 2000
Real time: 2002
Dead time: 0.10 %
Detector ID: 4

Detector system

Det 103 - DSPE-471

Calibration

Filename: D3_1LSa.Clb
Detector_103 1.0 Liter Sand Geometry

Energy Calibration

Created: 08-Aug-2005 11:09:41
Zero offset: 0.409 keV
Gain: 0.500 keV/channel
Quadratic: 1.092E-08 keV/channel^2

Efficiency Calibration

Created: 08-Aug-2005 11:11:25
Type: Polynomial
Uncertainty: 0.993 %
Coefficients: -0.264059 -5.138468 0.638383
 -0.089199 0.005011 -0.000129

Library Files

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

Analysis parameters

Analysis engine: Env32 G53W4.20
Start channel: 100 (50.41keV)
Stop channel: 4000 (2000.67keV)
Peak rejection level: 41.667%
Peak search sensitivity: 3
Sample Size: 1.6970E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.6970E+03) =
 5.8928E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	17-Jul-2006 11:03:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	103_150K_05AUG05.Pbc 08-Aug-2005 12:54:15
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 16 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.1714

***** S U M M A R Y O F P E A K S I N R A N G E *****									
Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc	
74.97	100.	26.50	0.99	9.052E-03	74.81	9.600	9.126E-01	PB212	
77.27	176.	15.09	0.99	1.011E-02	77.11	17.500	8.102E-01	PB212	
186.58	130.	26.86	1.09	2.565E-02	185.99	3.280	PBC<MDA	RA226	
209.37	116.	32.43	1.86	2.471E-02					
238.84	981.	3.77	1.09	2.319E-02	238.63	43.100	7.716E-01	PB212	
241.90	133.	19.38	1.10	2.303E-02	241.00	3.900	1.178E+00	RA224	
					241.92	7.470	6.161E-01	PB214	
270.45	118.	20.93	1.14	2.150E-02					
276.95	60.	41.11	1.50	2.105E-02					
276.95	60.	41.11	1.50	2.105E-02	279.17	81.500	PBC<MDA	HG203	
295.25	173.	14.96	1.08	2.025E-02	295.22	19.200	3.452E-01	PB214	
300.13	74.	27.56	0.94	2.001E-02					
328.29	49.	33.53	1.06	1.873E-02					
338.34	220.	14.17	0.97	1.830E-02	338.40	12.010	7.916E-01	AC228	
351.83	363.	7.80	1.18	1.776E-02	351.99	37.100	4.325E-01	PB214	
463.54	79.	28.74	1.32	1.425E-02	463.51	10.000	4.346E-01	SB125	
510.83	170.	16.69	1.53	1.317E-02	510.72	22.500	3.856E-01	TL208	
583.16	352.	8.85	1.23	1.184E-02	583.14	86.000	2.715E-01	TL208	
609.23	284.	8.55	1.40	1.144E-02	609.32	46.090	4.192E-01	BI214	
661.79	54.	25.31	1.60	1.072E-02	661.62	84.620	4.636E-02	CS137	
727.32	82.	18.03	1.59	9.963E-03	727.17	11.800	5.533E-01	BI212	
794.83	68.	25.13	1.28	9.310E-03					
794.83	68.	25.13	1.28	9.310E-03	795.76	85.400	6.873E-02	CS134	
860.29	78.	24.83	0.75	8.770E-03					
911.24	258.	10.00	1.46	8.400E-03	911.07	29.000	8.323E-01	AC228	
968.43	176.	11.90	0.91	8.029E-03	968.90	17.460	9.993E-01	AC228	
1120.67	98.	20.20	1.92	7.210E-03	1120.28	15.040	7.078E-01	BI214	

1460.88	1461.	2.66	1.77	5.932E-03	1460.75	10.700	1.810E+01	K40
1620.32	21.	25.69	0.92	5.488E-03	1620.56	2.750	1.090E+00	BI212
1764.66	48.	14.43	1.68	5.141E-03	1764.51	15.920	4.351E-01	BI214

***** U N I D E N T I F I E D P E A K S U M M A R Y *****									
Channel	Peak Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide		
417.90	209.37	483.	116.	0.058	97.28	1.856	AC-228	s	
540.04	270.45	213.	118.	0.059	62.80	1.140	AC-228	s	
599.40	300.13	171.	74.	0.037	82.69	0.943	PB-212		
655.72	328.29	115.	49.	0.024	100.58	1.056	RH-106M		
1719.61	860.29	86.	78.	0.039	74.50	0.747	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	322.	100.	0.050	79.51	0.993D	
PB-212	153.39	77.11	321.	176.	0.088	45.27	0.995A	
RA-226	371.61	186.22	605.	104.	0.052	92.20	1.500	
PB-212	476.86	238.85	535.	973.	0.486	14.59	0.973	
RA-224	482.01	241.43	620.	111.	0.056	99.08	1.500	
PB-214	482.79	241.82	310.	61.	0.030	123.20	0.454s	
HG-203	553.05	276.95	270.	60.	0.030	123.33	1.500s	
PB-214	589.65	295.25	228.	169.	0.084	44.87	1.081	
AC-228	675.82	338.34	259.	219.	0.109	42.52	0.970	
PB-214	702.79	351.83	175.	358.	0.179	23.41	1.180	
SB-125	925.09	462.98	153.	51.	0.026	107.56	1.500s	
TL-208	1020.77	510.83	203.	144.	0.072	50.06	1.526s	
TL-208	1165.43	583.16	167.	347.	0.174	26.56	1.233	
BI-214	1217.56	609.23	108.	278.	0.139	25.66	1.399	
CS-137	1322.68	661.79	65.	53.	0.026	75.93	1.595s	
BI-212	1453.71	727.32	60.	82.	0.041	54.10	1.594	
CS-134	1589.22	795.08	71.	41.	0.021	98.65	1.500	
AC-228	1821.51	911.24	105.	255.	0.127	30.01	1.460	
AC-228	1935.88	968.43	75.	176.	0.088	35.69	0.908s	
BI-214	2240.31	1120.67	92.	96.	0.048	60.60	1.917	
K-40	2920.62	1460.88	33.	1442.	0.721	7.97	1.772	
BI-212	3239.46	1620.32	2.	21.	0.010	77.08	0.920s	
BI-214	3528.07	1764.66	3.	45.	0.022	43.30	1.675	

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

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****									
- Nuclide -		Average	----- Peak -----						
Name	Code	Activity	Energy	Activity	Code	MDA	Value		
		pCi/gm	keV	pCi/gm		pCi/gm		COMMENTS	
BE-7		1.1114E-03	477.56	1.111E-03	%(	3.170E-01	9.15E-02	G	
K-40		1.8097E+01	1460.75	1.810E+01	(P	3.674E-01	4.87E-01	G	
MN-54		-3.1934E-04	834.81	-3.193E-04	%(P	3.909E-02	1.11E-02	G	
CO-57		1.4568E-02	122.07	1.457E-02	%(P	5.094E-02	1.53E-02	G K	
			136.43	1.153E-01	&	3.938E-01	1.18E-01	G	
CO-60		-4.5435E-03	1332.51	-4.543E-03	%(P	3.383E-02	8.86E-03	G K	
			1173.23	5.046E-03	% P	5.331E-02	1.53E-02	G K	
Sr-85		-1.4926E-02	514.00	-1.493E-02	%(	4.415E-02	1.32E-02	G	
Kr-85		-3.3650E+02	513.99	-3.365E+02	%(	9.938E+02	2.98E+02	G	
Y-88		2.6960E-04	1836.01	2.696E-04	%(P	2.992E-02	7.75E-03	G K	
			898.02	-1.847E-04	% P	3.811E-02	1.07E-02	G	
NB-94		1.1082E-02	871.10	1.108E-02	%(	3.375E-02	1.00E-02	G K	
			702.50	-1.470E-03	%	3.705E-02	1.07E-02	G K	
Ag-108M		1.4612E-02	722.95	1.461E-02	&(	3.905E-02	1.17E-02	G K	
			614.37	-1.558E-02	% P	3.764E-02	1.13E-02	G	
			433.93	0.000E+00	%	3.918E-02	1.14E-02	G	
CD-109		-3.4013E-01	88.04	-3.401E-01	%(	1.873E+00	5.61E-01	G	
SN-113		-8.3871E-03	391.71	-8.387E-03	%(	4.925E-02	1.45E-02	G K	
			255.04	-4.518E-01	%	1.634E+00	4.90E-01	G	

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	8.9267E-02	427.95	2.225E-02	% (P	1.034E-01	3.06E-02	G K
		600.77	7.590E-04	% P	1.558E-01	4.42E-02	G
		636.15	5.979E-02	% P	3.122E-01	9.12E-02	G
		463.51	2.876E-01	*(P	3.380E-01	1.06E-01	G
		176.29	8.092E-02	%	5.793E-01	1.73E-01	G
I-131	-3.7889E-04	364.48	3.789E-04	% (P	4.516E-02	1.31E-02	G K
		636.97	1.180E-02	&	5.485E-01	1.57E-01	G
		284.29	8.947E-02	% P	6.629E-01	1.97E-01	G
CS-134	1.7377E-02	604.66	3.503E-03	% (	3.446E-02	1.00E-02	G K
		795.76	4.124E-02	(P	4.217E-02	1.36E-02	G
		569.29	3.642E-02	% P	2.141E-01	6.25E-02	G
		801.84	8.864E-02	& P	3.336E-01	9.69E-02	G
CS-137	4.6358E-02	661.62	4.636E-02	(P	3.541E-02	1.20E-02	G
CE-139	-1.6961E-02	165.85	1.696E-02	% (	4.755E-02	1.43E-02	G
EU-152	-1.1417E-03	121.78	1.142E-03	% (P	1.392E-01	4.13E-02	G K
		344.30	1.577E-02	% P	1.159E-01	3.42E-02	G
		1408.08	2.733E-02	%	1.595E-01	4.52E-02	G
		964.00	8.394E-02	% P	3.402E-01	1.00E-01	G
		1112.07	3.413E-02	%	2.530E-01	7.21E-02	G
		778.90	6.905E-03	&	3.018E-01	8.65E-02	G
EU-154	3.0355E-02	123.10	3.035E-02	% (	1.008E-01	3.03E-02	G K
		1274.80	2.401E-02	%	1.124E-01	3.26E-02	G
		723.30	8.605E-03	&	3.380E-01	9.94E-02	G
		1004.80	7.666E-02	%	1.860E-01	5.58E-02	G
EU-155	8.7319E-02	86.45	8.732E-02	& (	2.487E-01	7.51E-02	G K
		105.31	6.134E-02	%	2.285E-01	6.87E-02	G
HG-203	2.8631E-02	279.17	2.863E-02	& (P	3.814E-02	1.18E-02	G K
		72.87	3.245E-01	% P	2.386E+00	7.14E-01	G
		70.83	6.412E-02	%	4.211E+00	1.25E+00	G
		82.50	7.838E-01	%	4.221E+00	1.27E+00	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	2.7149E-01	583.14	2.715E-01	(P	4.915E-02	2.43E-02	G
		510.72	3.856E-01	+ P	1.859E-01	7.63E-02	G
PB-212	8.0232E-01	238.63	7.746E-01	(P	8.804E-02	3.81E-02	G K
		77.11	7.932E-01	} P	3.878E-01	1.20E-01	G
		74.81	9.126E-01	(P	7.913E-01	2.49E-01	G
PB-214	4.3255E-01	351.99	4.325E-01	(P	7.786E-02	3.43E-02	G K
		295.22	3.452E-01	- P	1.498E-01	5.29E-02	G
		77.11	1.011E-03	} P	8.434E-01	2.93E-02	G
		241.92	2.806E-01	-	3.927E-01	1.15E-01	G
BI-212	5.5334E-01	727.17	5.533E-01	(P	2.634E-01	1.00E-01	G K
		1620.56	1.090E+00	+ P	5.195E-01	2.81E-01	G
		785.42	9.217E-01	%	1.724E+00	5.27E-01	G
BI-214	4.2326E-01	609.32	4.192E-01	(P	7.740E-02	3.67E-02	G K
		1764.51	4.351E-01	(P	1.084E-01	6.74E-02	G
		1120.28	7.078E-01	+ P	3.473E-01	1.46E-01	G
RA-224	9.8503E-01	241.00	9.850E-01	(	1.051E+00	3.25E-01	G
RA-226	9.8798E-01	185.99	9.880E-01	(P	1.110E+00	3.41E-01	G
AC-228	8.7381E-01	911.07	8.323E-01	(P	1.652E-01	8.44E-02	G K
		968.90	9.993E-01	(P	2.450E-01	1.19E-01	G
		338.40	7.916E-01	(P	2.818E-01	1.13E-01	G
TH-227	-9.7280E-03	236.00-9.728E-03	&(	4.879E-01	1.46E-01	G K	
		256.25-5.785E-03	% P	4.991E-01	1.47E-01	G	
PA-234	1.9139E-02	98.44	1.914E-02	%(P	2.282E-01	6.80E-02	G K
		946.00	2.991E-02	% P	1.940E-01	5.62E-02	G
		131.28-1.159E-02	& P	1.970E-01	5.86E-02	G	
		94.67-9.723E-02	% P	3.998E-01	1.20E-01	G	
		883.24-1.116E-02	%	2.544E-01	7.15E-02	G	
		926.70-2.975E-03	&	3.189E-01	8.98E-02	G	

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
		569.26	5.422E-02	% P	3.169E-01	9.25E-02	G
TH-234	1.2856E+00						
		63.29	1.286E+00	%(P	6.631E+00	1.98E+00	G K
		92.80	1.164E+00	% P	2.209E+00	6.68E-01	G
		92.38	1.396E+00	& P	2.615E+00	7.91E-01	G

AM-241 -2.2703E-02
59.54-2.270E-02 &(P 1.243E+00 3.69E-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:

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 *****						
Time of Count		Time Corrected		Uncertainty		3 Sigma
Nuclide	Activity	Activity	Activity	Counting	Total	MDA
	pCi/gm	pCi/gm	pCi/gm	pCi/gm	pCi/gm	pCi/gm
BE-7 #A	1.0777E-03	1.1114E-03	2.7460E-01	2.7460E-01	3.074E-01	
K-40	1.8097E+01	1.8097E+01	1.4610E+00	1.7995E+00		
MN-54 #A	-3.1766E-04	-3.1934E-04	2.3833E-02	2.3833E-02	3.888E-02	
CO-57 #B	1.4480E-02	1.4568E-02	4.5963E-02	4.5970E-02	5.063E-02	
CO-60 #B	-4.5396E-03	-4.5435E-03	1.7128E-01	1.7128E-01	3.380E-02	

Sr-85	#A	-1.4552E-02	-1.4926E-02	3.9723E-02	3.9732E-02	4.304E-02
Kr-85	#A	-3.3649E+02	-3.3650E+02	8.9422E+02	8.9443E+02	9.938E+02
Y-88	#B	2.6548E-04	2.6960E-04	2.3263E-02	2.3263E-02	2.946E-02
NB-94	#B	1.1082E-02	1.1082E-02	3.0029E-02	3.0035E-02	3.375E-02
Ag-108M	#B	1.4611E-02	1.4612E-02	3.5074E-02	3.5085E-02	3.905E-02
CD-109	#A	-3.3890E-01	-3.4013E-01	1.6827E+00	1.6828E+00	1.866E+00
SN-113	#B	-8.2681E-03	-8.3871E-03	4.3609E-02	4.3612E-02	4.855E-02
SB-125	#B	8.9122E-02	8.9267E-02	9.8395E-02	9.8531E-02	1.032E-01
I-131	#B	-3.0880E-04	-3.7889E-04	3.4515E-01	3.4515E-01	3.680E-02
CS-134	#B	1.7339E-02	1.7377E-02	1.7179E-02	1.7208E-02	3.438E-02
CS-137	#	4.6351E-02	4.6358E-02	3.6125E-02	3.6225E-02	
CE-139	#A	-1.6759E-02	-1.6961E-02	4.3027E-02	4.3038E-02	4.698E-02
EU-152	#B	-1.1413E-03	-1.1417E-03	9.2301E+00	9.2301E+00	1.391E-01
EU-154	#B	3.0339E-02	3.0355E-02	9.1013E-02	9.1029E-02	1.008E-01
EU-155	#B	8.7240E-02	8.7319E-02	2.2520E-01	2.2525E-01	2.485E-01
HG-203	#A	2.7638E-02	2.8631E-02	3.5335E-02	3.5374E-02	3.682E-02
TL-208		2.7149E-01	2.7149E-01	7.2993E-02	7.4676E-02	
PB-212		8.0232E-01	8.0232E-01	1.1852E-01	1.2734E-01	
PB-214		4.3255E-01	4.3255E-01	1.0287E-01	1.0589E-01	
BI-212		5.5334E-01	5.5334E-01	3.0117E-01	3.0288E-01	
BI-214		4.2326E-01	4.2326E-01	1.1114E-01	1.1382E-01	
RA-224	A	9.8503E-01	9.8503E-01	9.7602E-01	9.7769E-01	1.051E+00
RA-226	#A	9.8798E-01	9.8798E-01	1.0239E+00	1.0255E+00	1.110E+00
AC-228		8.7381E-01	8.7381E-01	1.8484E-01	1.9167E-01	
TH-227	#B	-9.7280E-03	-9.7280E-03	4.3704E-01	4.3704E-01	4.879E-01
PA-234	#B	1.9139E-02	1.9139E-02	2.0412E-01	2.0412E-01	2.282E-01
TH-234	#B	1.2856E+00	1.2856E+00	5.9434E+00	5.9439E+00	6.631E+00
AM-241	#A	-2.2703E-02	-2.2703E-02	1.3153E+00	1.3153E+00	1.243E+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) 2.2485323E+01 pCi/gm
Total Decayed Activity (87.4 to 2000.7 keV) 2.2485331E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
DAT

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

Sample description
OOL-OOL-13-01-014-F

Spectrum Filename: C:\GammaVision\Spectra\103F_20JUL2006_1559.An1

Acquisition information

Start time: 20-Jul-2006 15:59:34
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: 1.9140E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.9140E+03) =
5.2247E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	18-Jul-2006 14:10:00
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. 18 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.1460

***** S U M M A R Y O F P E A K S I N R A N G E *****								
Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
74.98	74.	36.52	0.99	9.052E-03	74.81	9.600	PBC<MDA	PB212
77.28	146.	18.97	0.99	1.011E-02	77.11	17.500	7.190E-01	PB212
					77.11	10.700	1.176E+00	PB214
87.19	106.	40.28	1.50	1.472E-02	86.45	32.740	PBC<MDA	EU155
					88.04	3.790	1.342E+00	CD109
93.29	112.	35.15	1.50	1.645E-02	92.38	2.570	PBC<MDA	TH234
					92.80	3.000	PBC<MDA	TH234
129.11	130.	30.06	1.68	2.438E-02				
185.99	131.	23.14	1.48	2.567E-02	185.99	3.280	PBC<MDA	RA226
209.29	128.	30.41	1.13	2.471E-02				
238.79	1085.	3.57	1.09	2.319E-02	238.63	43.100	7.580E-01	PB212
241.99	139.	18.87	1.10	2.302E-02	241.00	3.900	1.094E+00	RA224
					241.92	7.470	5.725E-01	PB214
270.01	89.	37.47	1.08	2.152E-02				
295.32	207.	13.33	0.87	2.024E-02	295.22	19.200	3.689E-01	PB214
300.47	65.	33.99	0.91	2.000E-02				
328.34	95.	31.21	1.33	1.873E-02				
338.72	228.	14.34	1.10	1.829E-02	338.40	12.010	7.298E-01	AC228
352.03	338.	7.96	1.00	1.775E-02	351.99	37.100	3.561E-01	PB214
463.12	94.	22.51	1.00	1.426E-02				
463.12	94.	22.51	1.00	1.426E-02	463.51	10.000	4.602E-01	SB125
510.78	173.	17.73	1.63	1.317E-02	510.72	22.500	3.488E-01	TL208
583.36	371.	7.72	1.38	1.184E-02	583.14	86.000	2.543E-01	TL208
609.37	272.	10.61	1.08	1.144E-02	609.32	46.090	3.556E-01	BI214
661.50	65.	31.99	1.89	1.072E-02				
661.50	65.	31.99	1.89	1.072E-02	661.62	84.620	4.974E-02	CS137
727.53	121.	17.28	1.51	9.961E-03	727.17	11.800	7.260E-01	BI212

769.11	50.	37.23	0.60	9.546E-03				
785.25	48.	33.07	1.26	9.394E-03	785.42	2.000	1.804E+00	BI212
794.89	70.	24.51	1.33	9.309E-03				
794.89	70.	24.51	1.33	9.309E-03	795.76	85.400	6.190E-02	CS134
860.84	43.	30.02	1.53	8.765E-03				
911.35	262.	7.63	1.64	8.399E-03	911.07	29.000	7.509E-01	AC228
964.78	46.	23.31	1.54	8.050E-03	964.00	14.580	PBC<MDA	EU152
969.38	166.	8.97	1.54	8.022E-03	968.90	17.460	8.361E-01	AC228
1120.15	81.	24.90	1.54	7.212E-03	1120.28	15.040	5.136E-01	BI214

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
1461.20	1346.	2.88	1.93	5.931E-03	1460.75	10.700	1.476E+01	K40
1620.27	25.	29.75	2.35	5.488E-03	1620.56	2.750	1.163E+00	BI212
1764.99	55.	13.48	1.80	5.141E-03	1764.51	15.920	4.462E-01	BI214

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

Peak Centroid	Background	Net Area	Intensity	Uncert	FWHM	Suspected
Channel Energy	Counts	Counts	Cts/Sec	3 Sigma %	keV	Nuclide

417.74	209.29	560.	128.	0.064	91.24	1.134 AC-228 s
539.18	270.01	381.	89.	0.045	112.42	1.080 AC-228 s
600.08	300.47	200.	65.	0.032	101.98	0.914 PB-212
655.83	328.34	283.	95.	0.048	93.64	1.325 RH-106M s
1537.28	769.11	104.	50.	0.025	111.70	0.604 BI-214 s
1720.72	860.84	50.	43.	0.021	90.06	1.529 TL-208
1929.76	964.93	41.	39.	0.019	84.73	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 Centroid	Background	Net Area	Intensity	Uncert	FWHM
	Channel Energy	Counts	Counts	Cts/Sec	3 Sigma %	keV

PB-212	148.79	74.81	357.	74.	0.037	109.57 0.993D
PB-212	153.39	77.11	349.	146.	0.073	56.91 0.995A
CD-109	173.55	87.19	854.	106.	0.053	120.83 1.500s
TH-234	185.75	93.29	996.	112.	0.056	105.46 1.500
RA-226	371.14	185.99	715.	127.	0.063	84.27 1.500D
PB-212	476.83	238.84	728.	1027.	0.514	15.74 1.058
RA-224	482.69	241.77	760.	109.	0.054	111.36 1.500
PB-214	589.80	295.32	246.	203.	0.102	40.00 0.870
AC-228	676.59	338.72	292.	227.	0.114	43.01 1.097s
PB-214	703.19	352.03	181.	332.	0.166	23.88 1.001
SB-125	925.69	463.28	141.	75.	0.037	74.25 1.500
TL-208	1020.68	510.78	235.	146.	0.073	53.20 1.632s
TL-208	1165.82	583.36	145.	367.	0.183	23.17 1.379
BI-214	1217.84	609.37	162.	266.	0.133	31.84 1.083s
CS-137	1322.32	661.62	108.	51.	0.026	93.25 1.500s
BI-212	1454.13	727.53	97.	121.	0.060	51.85 1.509s
BI-212	1569.57	785.25	68.	48.	0.024	99.22 1.257
CS-134	1589.76	795.35	60.	47.	0.024	81.58 1.500s
AC-228	1821.73	911.35	59.	259.	0.130	22.89 1.637s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
AC-228	1936.81	968.90	24.	167.	0.084	26.30	1.541D
BI-214	2239.28	1120.15	103.	79.	0.039	74.69	1.543
K-40	2921.26	1461.20	54.	1327.	0.664	8.64	1.925
BI-212	3239.36	1620.27	8.	25.	0.012	89.25	2.349s
BI-214	3528.74	1764.99	3.	52.	0.026	40.45	1.800

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

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

- Nuclide -	Average	----- Peak -----	
Name	Code	Activity	Energy
		pCi/gm	keV
			Activity
			pCi/gm
			Code
			MDA
			Value
			pCi/gm
			COMMENTS

BE-7	1.4192E-01	477.56	1.419E-01	% (	3.188E-01	9.64E-02	G
K-40	1.4764E+01	1460.75	1.476E+01	(P	4.101E-01	4.31E-01	G
MN-54	-1.0396E-02	834.81	-1.040E-02	%(P	3.352E-02	9.91E-03	G
CO-57	-8.9833E-03	122.07	-8.983E-03	%(P	4.903E-02	1.47E-02	G K
		136.43	-1.291E-03	%	3.224E-01	9.57E-02	G
CO-60	6.1280E-03	1332.51	6.128E-03	&(P	3.490E-02	9.86E-03	G K
		1173.23	4.338E-03	% P	4.887E-02	1.41E-02	G K
Sr-85	-1.9204E-02	514.00	-1.920E-02	&(	4.084E-02	1.24E-02	G
Kr-85	-4.3369E+02	513.99	-4.337E+02	&(	9.222E+02	2.79E+02	G
Y-88	5.2364E-03	1836.01	5.236E-03	%(P	2.558E-02	7.12E-03	G K
		898.02	-1.115E-02	& P	3.506E-02	1.03E-02	G
NB-94	5.5660E-03	871.10	5.566E-03	&(	3.163E-02	9.18E-03	G K
		702.50	5.756E-03	%	2.279E-02	6.65E-03	G K

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
Ag-108M	-1.8608E-02	722.95	1.861E-02	% (	4.560E-02	1.37E-02	G K
		614.37	2.795E-03	& P	3.800E-02	1.10E-02	G
		433.93	1.013E-02	%	2.798E-02	8.38E-03	G
CD-109	1.3421E+00	88.04	1.342E+00	*(	1.763E+00	5.41E-01	G
SN-113	1.7989E-02	391.71	1.799E-02	% (	3.489E-02	1.06E-02	G K
		255.04	1.449E-01	%	1.495E+00	4.44E-01	G
SB-125	1.2124E-01	427.95	3.677E-02	& (P	8.452E-02	2.55E-02	G K
		600.77	4.337E-03	& P	1.668E-01	4.80E-02	G
		636.15	5.868E-02	% P	2.862E-01	8.40E-02	G
		463.51	3.713E-01	(P	2.876E-01	9.35E-02	G
		176.29	1.411E-02	%	4.728E-01	1.40E-01	G
I-131	-9.6924E-03	364.48	9.692E-03	% (P	4.668E-02	1.39E-02	G K
		636.97	1.180E-01	%	4.933E-01	1.45E-01	G
		284.29	6.648E-02	% P	6.205E-01	1.84E-01	G
CS-134	1.9013E-02	604.66	1.341E-03	% (	6.014E-02	1.78E-02	G K
		795.76	4.227E-02	*(P	3.454E-02	1.15E-02	G
		569.29	2.302E-02	& P	2.090E-01	6.08E-02	G
		801.84	5.010E-02	% P	3.455E-01	9.92E-02	G
CS-137	3.9721E-02	661.62	3.972E-02	(P	3.979E-02	1.27E-02	G
CE-139	-8.0151E-03	165.85	8.015E-03	% (	4.490E-02	1.34E-02	G
EU-152	-2.6763E-02	121.78	2.676E-02	% (P	1.431E-01	4.29E-02	G K
		344.30	6.423E-03	% P	1.172E-01	3.45E-02	G
		1408.08	3.149E-02	%	1.368E-01	3.93E-02	G
		964.00	1.430E-01	% P	2.913E-01	8.84E-02	G
		1112.07	8.792E-02	&	3.904E-01	1.15E-01	G
		778.90	2.606E-02	&	2.083E-01	5.97E-02	G
EU-154	-2.1640E-02	123.10	2.164E-02	% (	9.389E-02	2.82E-02	G K
		1274.80	1.075E-04	&	1.165E-01	3.29E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
		723.30	9.693E-02	%	2.262E-01	6.83E-02	G
		1004.80	4.397E-02	%	1.654E-01	4.84E-02	G
EU-155	1.4475E-01						
		86.45	1.448E-01	& (	2.256E-01	6.88E-02	G K
		105.31	8.200E-02	%	2.259E-01	6.82E-02	G
HG-203	1.2959E-02						
		279.17	1.296E-02	%(P	3.666E-02	1.10E-02	G K
		72.87	6.439E-01	& P	2.200E+00	6.63E-01	G
		70.83	8.440E-01	%	3.184E+00	9.55E-01	G
		82.50	8.386E-01	%	3.685E+00	1.11E+00	G
TL-208	2.5430E-01						
		583.14	2.543E-01	(P	4.079E-02	1.99E-02	G
		510.72	3.488E-01	+ P	1.765E-01	7.31E-02	G
PB-212	7.2358E-01						
		238.63	7.254E-01	(P	9.068E-02	3.85E-02	G K
							Energy duplication
		77.11	5.806E-01	} P	3.579E-01	1.10E-01	G
		74.81	5.977E-01	- P	7.371E-01	2.27E-01	G
PB-214	3.6045E-01						
		351.99	3.561E-01	(P	7.008E-02	2.88E-02	G K
		295.22	3.689E-01	(P	1.376E-01	5.02E-02	G
							Energy duplication
		77.11	4.127E-02	} P	9.137E-01	2.07E-01	G
		241.92	3.631E-02	%	5.734E-01	1.71E-01	G
BI-212	7.2598E-01						
		727.17	7.260E-01	*(P	2.920E-01	1.26E-01	G K
		1620.56	1.163E+00	+ P	7.490E-01	3.47E-01	G
		785.42	1.804E+00	+	1.546E+00	5.96E-01	G
BI-214	3.7883E-01						
		609.32	3.556E-01	@(P	8.317E-02	3.87E-02	G K
		1764.51	4.462E-01	(P	9.608E-02	6.40E-02	G
		1120.28	5.136E-01	+ P	3.256E-01	1.31E-01	G
RA-224	8.5330E-01						
		241.00	8.533E-01	(	1.030E+00	3.17E-01	G
RA-226	1.0642E+00						
							Energy duplication
		185.99	1.064E+00	(P	1.067E+00	3.29E-01	G
AC-228	7.7371E-01						
		911.07	7.509E-01	(P	1.115E-01	5.81E-02	G K
		968.90	8.417E-01	(P	1.285E-01	7.38E-02	G
		338.40	7.298E-01	*(P	2.644E-01	1.05E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TH-227	2.7278E-02	236.00	2.728E-02	&(	2.651E-01	7.87E-02	G K
		256.25	2.366E-02	& P	4.272E-01	1.26E-01	G
PA-234	3.4653E-03	98.44	3.465E-03	%(P	2.213E-01	6.59E-02	G K
		946.00	3.158E-03	& P	1.629E-01	4.60E-02	G
		131.28	7.484E-02	% P	2.016E-01	6.09E-02	G
		94.67	4.214E-02	& P	3.978E-01	1.19E-01	G
		883.24	0.000E+00	%	2.658E-01	7.50E-02	G
		926.70	8.123E-02	%	2.294E-01	6.80E-02	G
		569.26	3.379E-02	& P	3.005E-01	8.74E-02	G
TH-234	4.3248E-01	63.29	4.703E-01	&(P	6.280E+00	1.86E+00	G K
		92.80	1.606E+00	(P	2.142E+00	6.53E-01	G
		92.38	1.540E+00	& P	2.564E+00	7.78E-01	G

AM-241 -2.8236E-01
59.54-2.824E-01 %(P 1.089E+00 3.27E-01 G
(- This peak used in the nuclide activity average.

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

Nuclide Codes:

T - Thermal Neutron Activation
F - Fast Neutron Activation
I - Fission Product
N - Naturally Occurring Isotope
P - Photon Reaction
C - Charged Particle Reaction
M - No MDA Calculation

Peak Codes:

G - Gamma Ray
X - X-Ray
P - Positron Decay
S - Single-Escape
D - Double-Escape
K - Key Line
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 *****					
Time of Count		Time Corrected		3 Sigma	
Nuclide	Activity	Activity	Counting	Total	MDA
	pCi/gm	pCi/gm	pCi/gm	pCi/gm	pCi/gm
BE-7 #A	1.3815E-01	1.4192E-01	2.8913E-01	2.8925E-01	3.103E-01
K-40	1.4764E+01	1.4764E+01	1.2939E+00	1.5521E+00	
MN-54 #A	-1.0349E-02	-1.0396E-02	3.1394E-02	3.1400E-02	3.336E-02
CO-57 #B	-8.9356E-03	-8.9833E-03	4.5594E-02	4.5596E-02	4.877E-02
CO-60 #B	6.1235E-03	6.1280E-03	2.9573E-02	2.9576E-02	3.488E-02
Sr-85 #A	-1.8782E-02	-1.9204E-02	3.7129E-02	3.7146E-02	3.994E-02
Kr-85 #A	-4.3368E+02	-4.3369E+02	8.3836E+02	8.3874E+02	9.222E+02
Y-88 #B	5.1662E-03	5.2364E-03	2.1353E-02	2.1355E-02	2.524E-02
NB-94 #B	5.5660E-03	5.5660E-03	2.7543E-02	2.7544E-02	3.163E-02
Ag-108M#B	-1.8607E-02	-1.8608E-02	4.1204E-02	4.1219E-02	4.559E-02
CD-109 #A	1.3379E+00	1.3421E+00	1.6217E+00	1.6234E+00	1.757E+00
SN-113 #B	1.7765E-02	1.7989E-02	3.1862E-02	3.1879E-02	3.445E-02
SB-125 #F	1.2106E-01	1.2124E-01	9.1554E-02	9.1824E-02	8.440E-02
I-131 #B	-8.1040E-03	-9.6924E-03	4.5254E-02	4.5258E-02	3.903E-02
CS-134 #B	1.8977E-02	1.9013E-02	1.5540E-02	1.5579E-02	6.002E-02
CS-137 #A	3.9716E-02	3.9721E-02	3.8049E-02	3.8118E-02	3.979E-02
CE-139 #A	-7.9317E-03	-8.0151E-03	4.0341E-02	4.0343E-02	4.443E-02
EU-152 #B	-2.6755E-02	-2.6763E-02	1.3844E-01	1.3845E-01	1.431E-01
EU-154 #B	-2.1630E-02	-2.1640E-02	8.4511E-02	8.4520E-02	9.384E-02
EU-155 #B	1.4464E-01	1.4475E-01	2.0651E-01	2.0666E-01	2.254E-01
HG-203 #B	1.2565E-02	1.2959E-02	3.3087E-02	3.3095E-02	3.555E-02
TL-208	2.5430E-01	2.5430E-01	5.9607E-02	6.1408E-02	
PB-212	7.2358E-01	7.2358E-01	1.1519E-01	1.2261E-01	
PB-214	3.6045E-01	3.6045E-01	8.5578E-02	8.8100E-02	
BI-212	7.2598E-01	7.2598E-01	3.7793E-01	3.8028E-01	
BI-214	3.7883E-01	3.7883E-01	1.0225E-01	1.0459E-01	
RA-224 A	8.5330E-01	8.5330E-01	9.5023E-01	9.5152E-01	1.030E+00
RA-226 #A	1.0642E+00	1.0642E+00	9.8838E-01	9.9031E-01	1.067E+00
AC-228	7.7371E-01	7.7371E-01	1.4355E-01	1.5042E-01	
TH-227 #B	2.7278E-02	2.7278E-02	2.3609E-01	2.3610E-01	2.651E-01
PA-234 #B	3.4653E-03	3.4653E-03	1.9776E-01	1.9776E-01	2.213E-01
TH-234 #B	4.3248E-01	4.3248E-01	5.2778E-01	5.2833E-01	6.280E+00
AM-241 #A	-2.8236E-01	-2.8236E-01	9.9278E-01	9.9291E-01	1.089E+00

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

H - Halflife limit exceeded

----- S U M M A R Y -----
Total Activity (1120.0 to 2000.7 keV) 1.8834133E+01 pCi/gm
Total Decayed Activity (1120.0 to 2000.7 keV) 1.8834133E+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-13-01-009-F-S

Spectrum Filename: C:\GammaVision\Spectra\107F_17JUL2006_1847.An1

Acquisition information

Start time: 17-Jul-2006 18:47:34
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: 1.8970E+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	17-Jul-2006 11:20:00
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. 25 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.1619

***** S U M M A R Y O F P E A 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	344.	13.19	1.18	2.842E-02	74.81	9.600	8.862E-01	PB212	
77.26	607.	7.52	1.18	2.977E-02	77.11	17.500	8.360E-01	PB212	
					77.11	10.700	1.357E+00	PB214	
83.45	119.	31.64	1.18	3.202E-02					
87.35	248.	16.31	1.19	3.314E-02	86.45	32.740	1.645E-01	EU155	
					88.04	3.790	1.402E+00	CD109	
89.95	141.	26.98	1.19	3.379E-02					
93.14	229.	16.47	1.19	3.450E-02	92.80	3.000	1.445E+00	TH234	
129.16	162.	34.62	0.97	3.818E-02					
185.95	246.	20.00	1.67	3.610E-02	185.99	3.280	1.478E+00	RA226	
209.10	146.	33.32	1.33	3.430E-02					
238.78	1463.	3.24	1.30	3.188E-02	238.63	43.100	7.498E-01	PB212	
241.57	225.	20.12	1.30	3.166E-02	241.00	3.900	1.285E+00	RA224	
					241.92	7.470	6.748E-01	PB214	
270.66	128.	25.37	1.27	2.941E-02					
277.28	69.	39.13	1.41	2.893E-02					
295.44	311.	8.49	1.34	2.767E-02	295.22	19.200	4.113E-01	PB214	
300.54	94.	24.05	1.34	2.733E-02					
328.03	56.	41.12	1.33	2.560E-02					
338.51	273.	12.89	1.34	2.500E-02	338.40	12.010	6.409E-01	AC228	
352.19	598.	6.14	1.55	2.425E-02	351.99	37.100	4.690E-01	PB214	
409.60	64.	36.00	1.30	2.154E-02					
462.97	117.	20.75	1.55	1.955E-02					
462.97	117.	20.75	1.55	1.955E-02	463.51	10.000	4.152E-01	SB125	
510.68	244.	13.38	2.11	1.808E-02	510.72	22.500	3.683E-01	TL208	
583.09	524.	6.00	1.54	1.629E-02	583.14	86.000	2.640E-01	TL208	
609.51	457.	6.30	1.71	1.574E-02	609.32	46.090	4.444E-01	BI214	

661.79	121.	19.98	1.51	1.477E-02	661.62	84.620	6.706E-02	CS137
727.03	142.	14.56	1.22	1.374E-02	727.17	11.800	6.199E-01	BI212
794.61	100.	26.46	1.18	1.285E-02				
794.61	100.	26.46	1.18	1.285E-02	795.76	85.400	6.464E-02	CS134
860.40	102.	18.72	1.32	1.211E-02				
911.32	362.	7.67	1.67	1.161E-02	911.07	29.000	7.577E-01	AC228
964.52	71.	19.19	1.80	1.113E-02				
969.20	219.	8.39	1.80	1.109E-02	968.90	17.460	7.970E-01	AC228
1120.30	123.	19.26	1.62	9.970E-03	1120.28	15.040	5.811E-01	BI214
1461.14	1784.	2.44	2.01	8.189E-03	1460.75	10.700	1.447E+01	K40
1621.19	14.	39.77	0.66	7.569E-03	1620.56	2.750	PBC<MDA	BI212
1764.84	77.	11.32	2.41	7.084E-03	1764.51	15.920	4.871E-01	BI214

***** U N I D E N T I F I E D P E A K S U M M A R Y *****									
Channel	Peak Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 3 Sigma %	FWHM keV	Suspected Nuclide		
166.57	83.67	650.	119.	0.060	94.92	1.184	TA-182	1D	
174.33	87.56	756.	188.	0.094	65.84	1.187	PB-214	D	
179.54	90.17	688.	115.	0.058	100.49	1.189	PB-214	D	
185.90	93.35	630.	221.	0.110	52.27	1.191	U-235	D	
257.97	129.16	1112.	155.	0.078	94.31	0.974	AC-228	s	
417.84	209.10	788.	146.	0.073	99.95	1.332	AC-228		
540.95	270.66	368.	128.	0.064	76.11	1.272	AC-228	s	
554.18	277.28	281.	84.	0.042	90.96	1.407	TL-208	s	
600.55	300.46	338.	100.	0.050	91.73	1.685	PB-212	sM	
655.68	328.03	223.	56.	0.028	123.37	1.329	AC-228		
818.80	409.60	181.	64.	0.032	108.01	1.301	AC-228		
1720.36	860.40	80.	102.	0.051	56.16	1.317	TL-208	s	
1929.19	964.56	58.	70.	0.035	58.27	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	807.	396.	0.198	33.60	1.178D	
PB-212	153.89	77.11	845.	437.	0.218	26.96	1.179A	
PB-214	153.89	77.11	1473.	179.	0.089	88.24	1.500A	
TH-234	185.80	93.07	1479.	211.	0.106	72.97	1.500s	
RA-226	371.54	185.95	802.	246.	0.123	59.99	1.674s	
TH-227	471.61	235.99	1313.	-150.	-0.075	105.37	1.500s	
PB-212	476.89	238.63	338.	1447.	0.724	9.41	1.297D	
PB-214	483.47	241.92	523.	200.	0.100	52.66	1.299D	
PB-214	590.36	295.37	317.	297.	0.149	32.23	1.531	
AC-228	676.64	338.51	349.	270.	0.135	38.66	1.342s	
PB-214	704.00	352.19	264.	592.	0.296	18.42	1.551s	
SB-125	926.16	463.28	176.	92.	0.046	66.77	1.500	
TL-208	1020.95	510.68	269.	210.	0.105	40.15	2.105s	
TL-208	1165.76	583.09	150.	519.	0.260	18.01	1.540s	
BI-214	1218.61	609.51	128.	453.	0.226	18.90	1.714s	
CS-137	1323.16	661.79	140.	118.	0.059	59.94	1.510s	

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
BI-212	1453.62	727.03	104.	141.	0.071	43.67	1.224
CS-134	1589.61	795.02	93.	61.	0.031	76.44	1.684s
AC-228	1822.20	911.32	115.	358.	0.179	23.01	1.671
AC-228	1937.36	968.90	75.	208.	0.104	26.88	1.799D
BI-214	2240.17	1120.30	120.	122.	0.061	57.77	1.620s
K-40	2921.88	1461.14	25.	1780.	0.890	7.31	2.009
BI-212	3242.00	1621.19	8.	14.	0.007	119.30	0.657s
BI-214	3529.34	1764.84	1.	77.	0.039	33.97	2.406s

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

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

- Nuclide -	Average	-----	Peak	-----		
Name	Code	Activity	Energy	Activity	Code	MDA Value
		pCi/gm	keV	pCi/gm		pCi/gm
						COMMENTS

BE-7	5.5888E-02		477.56	5.589E-02	% (	2.393E-01	7.11E-02	G
K-40	1.4466E+01		1460.75	1.447E+01	(P	2.123E-01	3.53E-01	G
MN-54	-9.4555E-04		834.81	-9.455E-04	%(P	2.955E-02	8.50E-03	G
CO-57	2.4073E-03		122.07	2.407E-03	&(P	3.630E-02	1.09E-02	G K
			136.43	-1.005E-01	% P	2.742E-01	8.28E-02	G
CO-60	-4.9606E-03		1332.51	-4.961E-03	%(P	2.901E-02	7.92E-03	G K
			1173.23	-3.236E-03	% P	4.248E-02	1.21E-02	G K
Sr-85	-2.1562E-02		514.00	-2.156E-02	&(	3.586E-02	1.10E-02	G
Kr-85	-5.2403E+02		513.99	-5.240E+02	&(P	8.287E+02	2.52E+02	G
Y-88	-8.5128E-04		1836.01	-8.513E-04	&(P	1.825E-02	4.48E-03	G K
			898.02	-2.353E-04	% P	2.655E-02	7.47E-03	G
NB-94	1.0643E-02		871.10	1.064E-02	%(P	2.242E-02	6.79E-03	G K
			702.50	-3.282E-03	% P	3.234E-02	9.47E-03	G K

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
Ag-108M	-1.2681E-02	722.95	1.268E-02	% (	3.660E-02	1.10E-02	G K
		614.37	2.242E-02	%	3.730E-02	1.14E-02	G
		433.93	7.125E-03	% P	2.740E-02	8.15E-03	G
CD-109	-6.8000E-02	88.04	6.800E-02	% (P	1.157E+00	3.47E-01	G
SN-113	-9.0505E-03	391.71	9.050E-03	% (P	3.910E-02	1.16E-02	G K
		255.04	3.917E-01	&	1.244E+00	3.74E-01	G
SB-125	7.8313E-02	427.95	8.082E-03	& (P	8.391E-02	2.46E-02	G K
		600.77	2.697E-02	& P	1.393E-01	4.10E-02	G
		636.15	5.900E-02	% P	2.153E-01	6.36E-02	G
		463.51	3.340E-01	(P	2.356E-01	7.66E-02	G
		176.29	2.897E-03	% P	4.350E-01	1.29E-01	G
I-131	4.1622E-03	364.48	4.162E-03	& (	2.894E-02	8.56E-03	G K
		636.97	8.190E-02	%	3.283E-01	9.70E-02	G
		284.29	1.303E-01	&	3.432E-01	1.03E-01	G
CS-134	1.7057E-02	604.66	2.784E-03	% (P	6.183E-02	1.84E-02	G K
		795.76	3.973E-02	(P	3.099E-02	1.02E-02	G
		569.29	2.544E-02	&	1.819E-01	5.36E-02	G
		801.84	7.156E-02	% P	3.018E-01	8.89E-02	G
CS-137	6.7062E-02	661.62	6.706E-02	*(P	3.301E-02	1.38E-02	G
CE-139	4.2589E-03	165.85	4.259E-03	% (P	3.354E-02	1.00E-02	G
EU-152	5.9373E-03	121.78	5.937E-03	& (P	1.034E-01	3.09E-02	G K
		344.30	1.760E-03	% P	6.886E-02	2.00E-02	G
		1408.08	4.885E-02	% P	1.066E-01	3.21E-02	G
		964.00	2.177E-01	& P	3.554E-01	1.09E-01	G
		1112.07	4.166E-02	% P	2.562E-01	7.48E-02	G
		778.90	5.053E-02	% P	2.181E-01	6.42E-02	G
EU-154	2.5734E-03	123.10	2.573E-03	% (P	7.527E-02	2.25E-02	G K
		1274.80	1.601E-02	& P	1.032E-01	3.01E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
		723.30	4.796E-02	% P	1.800E-01	5.36E-02	G
		1004.80	6.026E-02	& P	1.637E-01	4.89E-02	G
EU-155	9.3517E-02						
		86.45	9.352E-02	%(	1.311E-01	4.00E-02	G K
		105.31	4.463E-02	% P	1.475E-01	4.45E-02	G
HG-203	-7.7683E-03						
		279.17	7.768E-03	&(P	3.364E-02	1.01E-02	G K
		72.87	7.113E-01	% P	9.718E-01	2.96E-01	G
		70.83	1.649E-02	%	1.891E+00	5.68E-01	G
		82.50	5.512E-01	%	1.941E+00	5.85E-01	G
TL-208	2.6404E-01						
		583.14	2.640E-01	@(P	3.037E-02	1.60E-02	G
		510.72	3.683E-01	+ P	1.385E-01	5.72E-02	G
PB-212	7.4997E-01						
		238.63	7.500E-01	(P	4.578E-02	2.38E-02	G K
							Energy duplication
		77.11	6.013E-01	}	1.902E-01	5.40E-02	G
		74.81	1.031E+00	+ P	3.518E-01	1.17E-01	G
PB-214	4.6897E-01						
		351.99	4.690E-01	*(P	6.202E-02	2.91E-02	G K
		295.22	3.985E-01	- P	1.148E-01	4.35E-02	G
							Energy duplication
		77.11	4.020E-01	} P	4.087E-01	1.18E-01	G
		241.92	6.017E-01	+ P	3.296E-01	1.06E-01	G
BI-212	5.9327E-01						
		727.17	6.199E-01	(P	2.206E-01	9.10E-02	G K
		1620.56	4.791E-01	(P	5.439E-01	1.97E-01	G
		785.42	4.267E-01	% P	1.446E+00	4.29E-01	G
BI-214	4.5539E-01						
		609.32	4.444E-01	@(P	5.449E-02	2.83E-02	G K
		1764.51	4.871E-01	@(P	4.656E-02	5.58E-02	G
		1120.28	5.811E-01	+ P	2.551E-01	1.13E-01	G
RA-224	6.0477E-01						
		241.00	6.048E-01	%(P	9.406E-01	2.87E-01	G
RA-226	1.4775E+00						
		185.99	1.478E+00	(	8.104E-01	2.95E-01	G
AC-228	7.6075E-01						
		911.07	7.577E-01	(P	1.115E-01	5.88E-02	G K
		968.90	7.658E-01	(P	1.582E-01	6.94E-02	G
		338.40	6.409E-01	- P	2.129E-01	8.36E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TH-227	-2.9762E-01						
		236.00-2.976E-01	?(P 3.398E-01	1.04E-01	G	K	
		256.25-2.899E-04	& P 3.668E-01	1.08E-01	G		
PA-234	-3.1470E-02						
		98.44-3.147E-02	% (1.237E-01	3.72E-02	G	K	
		946.00 1.469E-03	% 1.514E-01	4.34E-02	G		
		131.28 6.389E-03	& 1.480E-01	4.42E-02	G		
		94.67-5.326E-02	% 2.466E-01	7.42E-02	G		
		883.24 5.266E-02	& 1.912E-01	5.63E-02	G		
		926.70 3.269E-03	% 2.461E-01	7.02E-02	G		
		569.26-3.774E-02	& 2.699E-01	7.95E-02	G		
TH-234	9.1914E-01						
		63.29 5.051E-01	%(P 1.564E+00	4.71E-01	G	K	
		92.80 1.457E+00	(P 1.256E+00	3.88E-01	G		
		92.38-5.526E-02	% P 1.521E+00	4.54E-01	G		

AM-241 -3.4962E-02
59.54-3.496E-02 %(P 2.187E-01 6.57E-02 G

(- This peak used in the nuclide activity average.

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

Nuclide Codes:

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

Peak Codes:

G - Gamma Ray
X - X-Ray
P - Positron Decay
S - Single-Escape
D - Double-Escape
K - Key Line
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 *****						
Time of Count		Time Corrected		Uncertainty		3 Sigma
Nuclide	Activity	Activity	Counting	Total	MDA	
	pCi/gm	pCi/gm	pCi/gm	pCi/gm	pCi/gm	
BE-7 #A	5.5663E-02	5.5888E-02	2.1324E-01	2.1327E-01	2.384E-01	
K-40	1.4466E+01	1.4466E+01	1.0598E+00	1.3613E+00		
MN-54 #A	-9.4490E-04	-9.4555E-04	4.3529E-02	4.3529E-02	2.953E-02	
CO-57 #B	2.4053E-03	2.4073E-03	3.2582E-02	3.2582E-02	3.627E-02	
CO-60 #B	-4.9600E-03	-4.9606E-03	1.0003E-01	1.0003E-01	2.901E-02	
Sr-85 #A	-2.1490E-02	-2.1562E-02	3.2869E-02	3.2893E-02	3.575E-02	
Kr-85 #A	-5.2403E+02	-5.2403E+02	8.4030E+02	8.4087E+02	8.287E+02	
Y-88 #B	-8.4956E-04	-8.5128E-04	2.1871E-02	2.1871E-02	1.821E-02	
NB-94 #B	1.0643E-02	1.0643E-02	2.0384E-02	2.0394E-02	2.242E-02	
Ag-108M#B	-1.2681E-02	-1.2681E-02	3.2920E-02	3.2929E-02	3.660E-02	
CD-109 #A	-6.7968E-02	-6.8000E-02	1.0980E+00	1.0980E+00	1.157E+00	
SN-113 #B	-9.0335E-03	-9.0505E-03	4.2497E-02	4.2501E-02	3.903E-02	
SB-125 #B	7.8297E-02	7.8313E-02	5.3897E-02	5.4095E-02	8.389E-02	
I-131 #B	4.0522E-03	4.1622E-03	2.5685E-02	2.5686E-02	2.817E-02	
CS-134 #B	1.7052E-02	1.7057E-02	1.3151E-02	1.3190E-02	6.181E-02	
CS-137 #	6.7061E-02	6.7062E-02	4.1401E-02	4.1590E-02		
CE-139 #A	4.2523E-03	4.2589E-03	3.0093E-02	3.0094E-02	3.348E-02	
EU-152 #B	5.9370E-03	5.9373E-03	9.2715E-02	9.2715E-02	1.034E-01	
EU-154 #B	2.5732E-03	2.5734E-03	6.7461E-02	6.7461E-02	7.527E-02	
EU-155 #B	9.3506E-02	9.3517E-02	1.2010E-01	1.2021E-01	1.311E-01	
HG-203 #B	-7.7325E-03	-7.7683E-03	3.3405E-02	3.3408E-02	3.348E-02	
TL-208 #	2.6404E-01	2.6404E-01	4.7960E-02	5.0432E-02		
PB-212	7.4997E-01	7.4997E-01	7.1361E-02	8.3990E-02		
PB-214	4.6897E-01	4.6897E-01	8.7149E-02	9.1445E-02		
BI-212	5.9327E-01	5.9327E-01	2.6144E-01	2.6378E-01		
BI-214 #	4.5539E-01	4.5539E-01	8.6895E-02	9.0962E-02		
RA-224 #A	6.0477E-01	6.0477E-01	8.6019E-01	8.6093E-01	9.406E-01	
RA-226 #	1.4775E+00	1.4775E+00	8.8637E-01	8.9066E-01		
AC-228	7.6075E-01	7.6075E-01	1.3609E-01	1.4332E-01		
TH-227 #A	-2.9762E-01	-2.9762E-01	3.1418E-01	3.1467E-01	3.398E-01	
PA-234 #B	-3.1470E-02	-3.1470E-02	1.1166E-01	1.1168E-01	1.237E-01	
TH-234 #B	9.1914E-01	9.1914E-01	7.3334E-01	7.3511E-01	1.564E+00	
AM-241 #A	-3.4962E-02	-3.4962E-02	2.0596E-01	2.0597E-01	2.187E-01	

- All peaks for activity calculation had bad shape.
 * - Activity omitted from total
 & - Activity omitted from total and all peaks had bad shape.
 < - MDA value printed.
 A - Activity printed, but activity < MDA.
 B - Activity < MDA and failed test.
 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) 1.9302889E+01 pCi/gm
Total Decayed Activity (1120.2 to 2000.1 keV) 1.9302891E+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-13-01-001-F

Spectrum Filename: C:\GammaVision\Spectra\107F_19JUL2006_1919.An1

Acquisition information

Start time: 19-Jul-2006 19:19:33
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: 1.7660E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.7660E+03) =
 5.6625E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	17-Jul-2006 10:55:00
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. 18 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.1455

***** S U M M A R Y O F P E A K S I N R A N G E *****								
Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. pCi/gm	Nuc
74.79	376.	11.86	1.18	2.849E-02	74.81	9.600	1.053E+00	PB212
77.09	366.	10.69	1.18	2.957E-02	77.11	17.500	8.332E-01	PB212
					77.11	10.700	1.351E+00	PB214
77.17	187.	27.88	1.50	2.957E-02	77.11	17.500	PBC<MDA	PB212
					77.11	10.700	PBC<MDA	PB214
83.55	92.	38.65	1.18	3.202E-02				
87.20	197.	19.40	1.19	3.308E-02	86.45	32.740	1.406E-01	EU155
					88.04	3.790	1.200E+00	CD109
89.55	128.	29.73	1.19	3.367E-02				
93.34	216.	17.85	1.19	3.452E-02	92.38	2.570	1.810E+00	TH234
					92.80	3.000	1.459E+00	TH234
129.35	148.	30.35	1.66	3.819E-02				
185.97	267.	19.04	1.67	3.610E-02				
185.97	267.	19.04	1.67	3.610E-02	185.99	3.280	1.724E+00	RA226
209.42	109.	34.13	0.90	3.427E-02				
238.79	1337.	3.55	1.30	3.187E-02	238.63	43.100	7.356E-01	PB212
241.89	200.	17.88	1.30	3.162E-02	241.00	3.900	1.227E+00	RA224
					241.92	7.470	6.446E-01	PB214
270.43	147.	23.21	1.53	2.943E-02				
295.31	281.	12.09	1.67	2.767E-02	295.22	19.200	3.981E-01	PB214
301.42	136.	22.51	1.57	2.726E-02				
338.79	323.	11.19	1.82	2.498E-02	338.40	12.010	8.146E-01	AC228
351.99	614.	7.67	1.72	2.426E-02	351.99	37.100	5.179E-01	PB214
463.26	89.	31.06	1.48	1.954E-02				
463.26	89.	31.06	1.48	1.954E-02	463.51	10.000	3.371E-01	SB125
510.68	231.	13.73	1.88	1.808E-02	510.72	22.500	3.716E-01	TL208
583.36	487.	7.48	1.90	1.629E-02	583.14	86.000	2.635E-01	TL208

609.42	442.	7.11	1.87	1.574E-02	609.32	46.090	4.620E-01	BI214
662.46	106.	22.35	1.73	1.476E-02	661.62	84.620	6.274E-02	CS137
727.76	129.	19.28	1.80	1.373E-02	727.17	11.800	6.026E-01	BI212
768.31	109.	25.44	1.38	1.318E-02				
794.99	60.	26.48	1.68	1.284E-02	795.76	85.400	4.180E-02	CS134
861.22	144.	16.94	0.96	1.210E-02				
911.36	403.	7.21	1.79	1.161E-02	911.07	29.000	9.062E-01	AC228
964.63	54.	23.82	1.80	1.113E-02	964.00	14.580	PBC<MDA	EU152
969.33	227.	8.03	1.80	1.109E-02	968.90	17.460	8.867E-01	AC228

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
1121.03	93.	19.97	1.53	9.965E-03	1120.28	15.040	4.701E-01	BI214
1132.06	49.	39.54	0.58	9.894E-03				
1461.17	1861.	2.43	2.27	8.189E-03	1460.75	10.700	1.621E+01	K40
1765.17	81.	11.04	2.76	7.084E-03	1764.51	15.920	5.503E-01	BI214

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

Peak Centroid	Background	Net Area	Intensity	Uncert	FWHM	Suspected
Channel Energy	Counts	Counts	Cts/Sec	3 Sigma %	keV	Nuclide

178.76	89.67	655.	128.	0.064	89.18	PB-214 lD
418.47	209.42	529.	109.	0.054	102.39	0.898 AC-228
540.50	270.43	394.	147.	0.074	69.64	1.528 AC-228
602.46	301.42	307.	136.	0.068	67.53	1.572 PB-212 s
1536.18	768.31	165.	109.	0.054	57.67	1.379 BI-214 M
1722.00	861.22	99.	151.	0.075	37.22	0.963 TL-208 s
1929.66	964.65	53.	59.	0.029	65.74	1.797 AC-228 D
2263.68	1132.06	96.	49.	0.024	118.62	0.583 J-135 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	Centroid	Background	Net Area	Intensity	Uncert	FWHM
	Channel	Energy	Counts	Counts	Cts/Sec	3 Sigma %	keV

HG-203	146.21	73.27	1770.	-151.	-0.076	120.50	1.500s
PB-212	149.29	74.81	831.	376.	0.188	35.57	1.178D
PB-212	153.89	77.11	893.	366.	0.183	32.07	1.179A
PB-214	153.89	77.11	1543.	187.	0.094	83.63	1.500A
EU-155	173.85	87.09	1547.	152.	0.076	112.18	1.500s
TH-234	186.13	93.23	1463.	183.	0.092	82.07	1.500s
RA-226	371.93	186.14	843.	178.	0.089	72.85	1.500s
TH-227	471.35	235.86	1284.	-143.	-0.071	109.80	1.500s
PB-212	476.89	238.63	423.	1314.	0.657	10.45	1.297D
PB-214	483.47	241.92	556.	187.	0.093	57.50	1.299D
PB-214	590.23	295.31	341.	276.	0.138	36.28	1.672s
AC-228	677.20	338.79	320.	320.	0.160	33.57	1.820s
PB-214	703.60	351.99	417.	609.	0.305	23.01	1.715s
SB-125	926.32	463.36	196.	51.	0.025	117.84	1.500
TL-208	1020.96	510.68	249.	198.	0.099	41.20	1.880s
TL-208	1166.30	583.36	215.	482.	0.241	22.44	1.905s
BI-214	1218.42	609.42	170.	438.	0.219	21.32	1.869s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
CS-137	1324.51	662.46	142.	102.	0.051	67.06	1.730s
BI-212	1455.09	727.76	145.	128.	0.064	57.84	1.796s
CS-134	1589.55	794.99	98.	60.	0.030	79.44	1.684s
AC-228	1822.27	911.36	117.	399.	0.199	21.63	1.792
AC-228	1937.36	968.90	61.	224.	0.112	24.52	1.799D
BI-214	2241.63	1121.03	85.	92.	0.046	59.92	1.535s
K-40	2921.93	1461.17	40.	1856.	0.928	7.30	2.273
BI-214	3529.99	1765.17	1.	81.	0.041	33.13	2.760s

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

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

- Nuclide -	Average	----- Peak -----	
Name Code	Activity	Energy Activity Code MDA Value	COMMENTS
	pCi/gm	keV pCi/gm pCi/gm	

BE-7	-1.5369E-03	477.56-1.537E-03	%(2.562E-01 7.45E-02 G
K-40	1.6205E+01	1460.75 1.621E+01	(P 2.808E-01 3.95E-01 G
MN-54	5.9735E-03	834.81 5.973E-03	%(P 2.587E-02 7.58E-03 G
CO-57	1.6331E-03	122.07 1.633E-03	&(P 3.831E-02 1.14E-02 G K
		136.43-7.356E-02	% P 2.726E-01 8.20E-02 G
CO-60	1.3404E-02	1332.51 1.340E-02	%(P 3.084E-02 9.14E-03 G K
		1173.23 1.255E-02	% P 4.006E-02 1.18E-02 G K
Sr-85	-1.6400E-02	514.00-1.640E-02	&(3.576E-02 1.08E-02 G
Kr-85	-3.9911E+02	513.99-3.991E+02	&(P 8.091E+02 2.44E+02 G
Y-88	-9.2664E-04	1836.01-9.266E-04	%(P 3.134E-02 8.45E-03 G K
		898.02 8.738E-03	% P 2.878E-02 8.48E-03 G
NB-94	-5.8680E-03	871.10-5.868E-03	&(P 2.695E-02 7.88E-03 G K
		702.50 4.700E-03	& P 3.083E-02 9.04E-03 G K

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
Ag-108M	1.4217E-03	722.95	1.422E-03	&(	6.307E-02	1.87E-02	G K
		614.37	2.729E-02	&	3.940E-02	1.21E-02	G
		433.93	6.963E-04	% P	2.784E-02	8.07E-03	G
CD-109	3.6955E-02	88.04	3.695E-02	%(P	1.196E+00	3.58E-01	G
SN-113	1.1496E-02	391.71	1.150E-02	%(P	3.990E-02	1.19E-02	G K
		255.04	4.264E-01	%	1.260E+00	3.79E-01	G
SB-125	4.8206E-02	427.95	2.570E-03	%(P	8.562E-02	2.49E-02	G K
		600.77	5.783E-02	& P	1.517E-01	4.53E-02	G
		636.15	9.045E-03	% P	2.192E-01	6.31E-02	G
		463.51	1.985E-01	(P	2.667E-01	8.23E-02	G
		176.29	6.775E-02	& P	4.136E-01	1.23E-01	G
I-131	6.4755E-03	364.48	6.476E-03	&(	3.382E-02	1.00E-02	G K
		636.97	1.573E-02	%	4.066E-01	1.17E-01	G
		284.29	5.291E-02	&	5.173E-01	1.53E-01	G
CS-134	1.5742E-02	604.66	7.057E-03	%(P	2.976E-02	8.80E-03	G K
		795.76	4.180E-02	*(P	3.413E-02	1.12E-02	G
		569.29	1.118E-03	%	1.692E-01	4.89E-02	G
		801.84	1.129E-01	% P	3.917E-01	1.16E-01	G
CS-137	6.2739E-02	661.62	6.274E-02	@(P	3.560E-02	1.45E-02	G
CE-139	-1.2940E-03	165.85	1.294E-03	%(P	3.587E-02	1.07E-02	G
EU-152	3.4295E-03	121.78	3.430E-03	%(P	1.151E-01	3.44E-02	G K
		344.30	2.143E-02	% P	1.006E-01	3.00E-02	G
		1408.08	3.034E-02	% P	1.438E-01	4.16E-02	G
		964.00	8.158E-03	% P	3.441E-01	1.01E-01	G
		1112.07	6.567E-02	% P	2.427E-01	7.15E-02	G
		778.90	6.417E-03	% P	2.129E-01	6.09E-02	G
EU-154	7.9166E-04	123.10	7.917E-04	%(P	7.867E-02	2.35E-02	G K
		1274.80	2.117E-02	& P	1.039E-01	3.04E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
		723.30	8.560E-03	& P	3.048E-01	9.03E-02	G
		1004.80	5.302E-02	& P	2.053E-01	6.07E-02	G
EU-155	1.0856E-01						
		86.45	1.086E-01	(	1.325E-01	4.06E-02	G K
		105.31	2.457E-02	% P	1.500E-01	4.50E-02	G
HG-203	-6.9506E-04						
		279.17	-6.951E-04	% (P	3.028E-02	8.90E-03	G K
		72.87	-6.664E-01	% P	1.070E+00	3.25E-01	G
		70.83	-1.297E+00	+	1.705E+00	5.21E-01	G
		82.50	-8.805E-01	%	2.092E+00	6.34E-01	G
TL-208	2.6352E-01						
		583.14	2.635E-01	*(P	3.876E-02	1.99E-02	G
		510.72	3.716E-01	+ P	1.435E-01	5.97E-02	G
PB-212	7.6087E-01						
		238.63	7.315E-01	(P	5.485E-02	2.58E-02	G K
							Energy duplication
		77.11	5.410E-01	}	2.100E-01	5.78E-02	G
		74.81	1.053E+00	+ P	3.833E-01	1.26E-01	G
PB-214	5.3232E-01						
		351.99	5.179E-01	*(P	8.320E-02	4.01E-02	G K
		295.22	3.981E-01	- P	1.277E-01	4.89E-02	G
							Energy duplication
		77.11	4.530E-01	} P	4.492E-01	1.26E-01	G
		241.92	6.041E-01	(P	3.648E-01	1.17E-01	G
BI-212	6.0264E-01						
		727.17	6.026E-01	@(P	2.778E-01	1.17E-01	G K
		1620.56	2.504E-01	& P	7.887E-01	2.29E-01	G
		785.42	2.955E-01	% P	1.398E+00	4.10E-01	G
BI-214	4.8184E-01						
		609.32	4.620E-01	@(P	6.692E-02	3.32E-02	G K
		1764.51	5.503E-01	(P	5.001E-02	6.15E-02	G
		1120.28	4.701E-01	*(P	2.329E-01	9.48E-02	G
RA-224	5.9472E-03						
		241.00	5.947E-03	%(P	8.936E-01	2.66E-01	G
RA-226	1.1491E+00						
		185.99	1.149E+00	*(	8.920E-01	2.79E-01	G
AC-228	8.8163E-01						
		911.07	9.062E-01	(P	1.209E-01	6.61E-02	G K
		968.90	8.869E-01	(P	1.540E-01	7.32E-02	G
		338.40	8.146E-01	*(P	2.194E-01	9.22E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TH-227	-3.0326E-01						
		236.00-3.033E-01	?(P 3.611E-01	1.11E-01	G	K	
		256.25-4.238E-03	% P 4.013E-01	1.19E-01	G		
PA-234	4.0124E-02						
		98.44 4.012E-02	%(1.398E-01	4.21E-02	G	K	
		946.00-2.947E-02	& 1.773E-01	5.20E-02	G		
		131.28-3.213E-02	& 1.666E-01	5.01E-02	G		
		94.67-3.023E-03	% 2.605E-01	7.79E-02	G		
		883.24-6.493E-02	& 2.482E-01	7.33E-02	G		
		926.70 3.459E-02	& 2.613E-01	7.57E-02	G		
		569.26-2.091E-02	% 2.623E-01	7.66E-02	G		
TH-234	8.7456E-01						
		63.29 5.005E-01	&(P 1.664E+00	5.00E-01	G	K	
		92.80 1.361E+00	*(P 1.342E+00	4.12E-01	G		
		92.38-8.771E-02	% P 1.560E+00	4.65E-01	G		
AM-241	-5.1774E-02						
		59.54-5.177E-02	%(P 2.276E-01	6.85E-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:

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

Peak Codes:

G - Gamma Ray
X - X-Ray
P - Positron Decay
S - Single-Escape
D - Double-Escape
K - Key Line
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 *****						
Time of Count		Time Corrected		Uncertainty		3 Sigma
Nuclide	Activity	Activity	Activity	Counting	Total	MDA
	pCi/gm	pCi/gm	pCi/gm	pCi/gm	pCi/gm	pCi/gm
BE-7 #A	-1.4907E-03	-1.5369E-03	2.2346E-01	2.2346E-01	2.485E-01	
K-40	1.6205E+01	1.6205E+01	1.1862E+00	1.5242E+00		
MN-54 #A	5.9424E-03	5.9735E-03	2.2736E-02	2.2739E-02	2.574E-02	
CO-57 #B	1.6233E-03	1.6331E-03	3.4342E-02	3.4342E-02	3.808E-02	
CO-60 #B	1.3392E-02	1.3404E-02	2.7417E-02	2.7429E-02	3.082E-02	
Sr-85 #A	-1.5993E-02	-1.6400E-02	3.2485E-02	3.2499E-02	3.487E-02	
Kr-85 #A	-3.9910E+02	-3.9911E+02	8.4855E+02	8.4888E+02	8.091E+02	
Y-88 #B	-9.1258E-04	-9.2664E-04	4.1234E-02	4.1234E-02	3.086E-02	
NB-94 #B	-5.8680E-03	-5.8680E-03	2.4364E-02	2.4366E-02	2.695E-02	
Ag-108M#B	1.4217E-03	1.4217E-03	5.5983E-02	5.5983E-02	6.307E-02	
CD-109 #A	3.6822E-02	3.6955E-02	1.0746E+00	1.0746E+00	1.192E+00	
SN-113 #B	1.1335E-02	1.1496E-02	3.5711E-02	3.5717E-02	3.934E-02	
SB-125 #B	4.8128E-02	4.8206E-02	5.9963E-02	6.0031E-02	8.548E-02	
I-131 #B	5.2878E-03	6.4755E-03	3.0067E-02	3.0070E-02	2.762E-02	
CS-134 #B	1.5708E-02	1.5742E-02	1.2616E-02	1.2650E-02	2.969E-02	
CS-137 #	6.2730E-02	6.2739E-02	4.3522E-02	4.3680E-02		
CE-139 #A	-1.2787E-03	-1.2940E-03	3.6750E-02	3.6750E-02	3.545E-02	
EU-152 #B	3.4283E-03	3.4295E-03	1.0317E-01	1.0317E-01	1.150E-01	
EU-154 #B	7.9124E-04	7.9166E-04	7.0407E-02	7.0407E-02	7.862E-02	
EU-155 #A	1.0846E-01	1.0856E-01	1.2178E-01	1.2193E-01	1.324E-01	
HG-203 #B	-6.7118E-04	-6.9506E-04	1.1728E-01	1.1728E-01	2.924E-02	
TL-208 #	2.6352E-01	2.6352E-01	5.9692E-02	6.1688E-02		
PB-212	7.6087E-01	7.6087E-01	8.0430E-02	9.2133E-02		
PB-214	5.3232E-01	5.3232E-01	1.2354E-01	1.2748E-01		
BI-212 #	6.0264E-01	6.0264E-01	3.5209E-01	3.5388E-01		
BI-214	4.8184E-01	4.8184E-01	1.0376E-01	1.0760E-01		
RA-224 #A	5.9472E-03	5.9472E-03	7.9801E-01	7.9801E-01	8.936E-01	
RA-226 #	1.1491E+00	1.1491E+00	8.3713E-01	8.3987E-01	8.920E-01	
AC-228	8.8163E-01	8.8163E-01	1.3912E-01	1.4855E-01		
TH-227 #A	-3.0326E-01	-3.0326E-01	3.3361E-01	3.3409E-01	3.611E-01	
PA-234 #B	4.0124E-02	4.0124E-02	1.2637E-01	1.2639E-01	1.398E-01	
TH-234 #B	8.7456E-01	8.7456E-01	7.9496E-01	7.9643E-01	1.664E+00	
AM-241 #A	-5.1773E-02	-5.1774E-02	2.1215E-01	2.1217E-01	2.276E-01	

- All peaks for activity calculation had bad shape.
 * - Activity omitted from total
 & - Activity omitted from total and all peaks had bad shape.
 < - MDA value printed.
 A - Activity printed, but activity < MDA.
 B - Activity < MDA and failed test.
 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) 1.9790718E+01 pCi/gm
Total Decayed Activity (1120.2 to 2000.1 keV) 1.9790726E+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-13-01-002-F

Spectrum Filename: C:\GammaVision\Spectra\107F_19JUL2006_1956.An1

Acquisition information

Start time: 19-Jul-2006 19:56:27
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: 1.5250E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.5250E+03) =
6.5574E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	14-Jul-2006 14:00:00
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. 19 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.1847

***** S U M M A R Y O F P E A 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	301.	14.14	1.18	2.851E-02	74.81	9.600	9.627E-01	PB212	
76.90	451.	10.39	1.18	2.938E-02	77.11	10.700	1.251E+00	PB214	
					77.11	17.500	7.730E-01	PB212	
84.42	90.	38.67	1.18	3.232E-02					
87.09	188.	19.13	1.19	3.308E-02	86.45	32.740	1.551E-01	EU155	
					88.04	3.790	PBC<MDA	CD109	
89.33	112.	31.97	1.19	3.365E-02					
93.22	181.	20.38	1.19	3.452E-02	92.38	2.570	1.743E+00	TH234	
					92.80	3.000	PBC<MDA	TH234	
128.91	107.	40.67	0.96	3.818E-02					
128.91	107.	40.67	0.96	3.818E-02	131.28	20.000	1.236E-01	PA234	
185.80	196.	19.94	1.61	3.612E-02	185.99	3.280	1.470E+00	RA226	
209.42	150.	20.69	1.71	3.427E-02					
239.11	1549.	3.95	1.63	3.186E-02	238.63	43.100	9.882E-01	PB212	
242.04	159.	20.84	1.30	3.163E-02	241.00	3.900	1.138E+00	RA224	
					241.92	7.470	5.957E-01	PB214	
295.41	227.	10.80	1.34	2.767E-02	295.22	19.200	3.715E-01	PB214	
300.13	69.	29.45	1.34	2.735E-02					
328.17	121.	22.27	1.75	2.559E-02					
338.38	312.	11.30	1.91	2.500E-02	338.40	12.010	9.100E-01	AC228	
352.03	540.	7.25	1.68	2.426E-02	351.99	37.100	5.262E-01	PB214	
462.64	115.	16.66	2.00	1.956E-02					
462.64	115.	16.66	2.00	1.956E-02	463.51	10.000	5.109E-01	SB125	
511.13	257.	11.58	1.81	1.807E-02	510.72	22.500	4.861E-01	TL208	
583.26	487.	6.48	1.82	1.629E-02	583.14	86.000	3.052E-01	TL208	
609.47	388.	8.37	1.51	1.574E-02	609.32	46.090	4.685E-01	BI214	
661.45	131.	22.27	1.68	1.477E-02	661.62	84.620	9.040E-02	CS137	

727.84	118.	21.06	1.03	1.373E-02	727.17	11.800	6.378E-01	BI212
785.30	48.	29.71	0.94	1.297E-02	785.42	2.000	1.590E+00	BI212
795.14	60.	22.44	0.87	1.285E-02				
795.14	60.	22.44	0.87	1.285E-02	795.76	85.400	4.870E-02	CS134
911.49	352.	8.65	2.06	1.160E-02	911.07	29.000	9.152E-01	AC228
965.83	42.	35.52	1.80	1.112E-02				
969.22	151.	10.55	1.80	1.109E-02	968.90	17.460	6.818E-01	AC228
1120.97	106.	22.47	1.75	9.965E-03	1120.28	15.040	6.188E-01	BI214

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
1461.14	1558.	2.58	2.21	8.189E-03	1460.75	10.700	1.571E+01	K40
1764.67	71.	11.87	1.48	7.083E-03	1764.51	15.920	5.509E-01	BI214

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

Peak Centroid	Background	Net Area	Intensity	Uncert	FWHM	Suspected
Channel Energy	Counts	Counts	Cts/Sec	3 Sigma %	keV	Nuclide

168.51	84.65	556.	90.	0.045	116.01	1.185 TA-182 1D
173.85	87.33	551.	188.	0.094	57.38	1.187 PB-214 1D
178.32	89.56	582.	112.	0.056	95.91	1.188 PB-212 1D
418.48	209.42	371.	150.	0.075	62.08	1.713 AC-228 s
599.72	300.05	191.	60.	0.030	105.12	1.607 PB-212 M
655.95	328.17	216.	121.	0.060	66.80	1.749 AC-228 s
1931.23	965.82	89.	42.	0.021	106.56	1.797 TB-160 1D

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	Centroid	Background	Net Area	Intensity	Uncert	FWHM
	Channel	Energy	Counts	Counts	Cts/Sec	3 Sigma %	keV

PB-212	149.29	74.81	750.	306.	0.153	41.04	1.178D
PB-212	153.89	77.11	769.	445.	0.222	25.27	1.179A
TH-234	185.82	93.08	1307.	151.	0.075	99.31	1.500s
TH-234	185.80	93.07	1267.	144.	0.072	94.71	1.500s
RA-226	371.24	185.80	536.	196.	0.098	59.82	1.608s
TH-227	471.20	235.78	1095.	-117.	-0.058	123.68	1.500s
PB-212	476.89	238.63	360.	1165.	0.583	10.99	1.297D
PB-214	483.47	241.92	479.	159.	0.079	62.52	1.299D
PB-214	590.64	295.51	514.	306.	0.153	44.76	1.716s
AC-228	676.38	338.38	294.	308.	0.154	33.91	1.907s
PB-214	703.66	352.03	288.	534.	0.267	21.74	1.676s
SB-125	925.89	463.15	141.	76.	0.038	71.89	1.500s
TL-208	1021.86	511.13	208.	223.	0.112	34.73	1.811s
TL-208	1166.11	583.26	150.	482.	0.241	19.43	1.815s
BI-214	1218.52	609.47	175.	384.	0.192	25.12	1.514s
CS-137	1322.47	661.45	184.	127.	0.064	66.81	1.676s
BI-212	1455.24	727.84	136.	117.	0.058	63.18	1.028s
BI-212	1570.18	785.30	60.	47.	0.023	89.14	0.939s
CS-134	1590.49	795.46	60.	47.	0.024	80.99	1.684s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
AC-228	1822.54	911.49	126.	348.	0.174	25.94	2.058
AC-228	1937.36	968.90	63.	149.	0.074	32.83	1.799D
BI-214	2241.51	1120.97	121.	105.	0.052	67.42	1.754s
K-40	2921.88	1461.14	20.	1554.	0.777	7.75	2.214
BI-214	3529.00	1764.67	1.	70.	0.035	35.60	1.485s

s - Peak fails shape tests.

D - Peak area deconvoluted.

A Derived peak area.

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

- Nuclide - Average ----- Peak -----
Name Code Activity Energy Activity Code MDA Value
pCi/gm keV pCi/gm pCi/gm COMMENTS

BE-7	6.8759E-02	477.56	6.876E-02	%(	2.989E-01	8.86E-02	G
K-40	1.5710E+01	1460.75	1.571E+01	(P	2.393E-01	4.07E-01	G
MN-54	1.2420E-02	834.81	1.242E-02	&(P	3.259E-02	9.76E-03	G
CO-57	4.0137E-03	122.07	4.014E-03	&(P	4.021E-02	1.20E-02	G K
		136.43	3.255E-02	& P	3.189E-01	9.53E-02	G
CO-60	-3.0532E-03	1332.51	3.053E-03	%(P	3.888E-02	1.06E-02	G K
		1173.23	2.938E-03	% P	4.135E-02	1.15E-02	G K
Sr-85	-2.3112E-02	514.00	2.311E-02	%(	4.587E-02	1.39E-02	G
Kr-85	-5.3878E+02	513.99	5.388E+02	%(P	1.006E+03	3.04E+02	G
Y-88	-1.0935E-03	1836.01	1.093E-03	%(P	9.909E-03	1.34E-03	G K
		898.02	1.606E-03	% P	3.105E-02	8.63E-03	G
NB-94	6.9392E-03	871.10	6.939E-03	%(P	2.842E-02	8.33E-03	G K
		702.50	3.877E-04	& P	3.972E-02	1.15E-02	G K

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
Ag-108M	8.2323E-04	722.95	8.232E-04	&(	6.295E-02	1.85E-02	G K
		614.37	1.541E-02	%	4.048E-02	1.22E-02	G
		433.93	2.496E-03	& P	2.857E-02	8.32E-03	G
CD-109	3.5443E-02	88.04	3.544E-02	%(P	1.338E+00	4.01E-01	G
SN-113	-1.8381E-03	391.71	1.838E-03	%(P	4.381E-02	1.27E-02	G K
		255.04	2.055E-01	&	1.440E+00	4.29E-01	G
SB-125	9.3442E-02	427.95	8.444E-03	%(P	8.996E-02	2.63E-02	G K
		600.77	2.621E-02	& P	1.788E-01	5.22E-02	G
		636.15	1.011E-01	% P	2.615E-01	7.84E-02	G
		463.51	3.450E-01	*(P	2.641E-01	8.57E-02	G
		176.29	4.090E-02	% P	5.084E-01	1.52E-01	G
I-131	-4.7163E-03	364.48	4.716E-03	&(	4.882E-02	1.43E-02	G K
		636.97	2.761E-01	%	6.092E-01	1.84E-01	G
		284.29	2.650E-02	&	7.262E-01	2.14E-01	G
CS-134	1.6361E-02	604.66	2.844E-03	%(P	7.076E-02	2.10E-02	G K
		795.76	3.831E-02	(P	3.142E-02	1.05E-02	G
		569.29	6.454E-02	&	2.040E-01	6.09E-02	G
		801.84	2.136E-03	% P	4.112E-01	1.18E-01	G
CS-137	9.0397E-02	661.62	9.040E-02	*(P	4.669E-02	2.07E-02	G
CE-139	1.0497E-02	165.85	1.050E-02	%(P	3.981E-02	1.20E-02	G
EU-152	1.1399E-02	121.78	1.140E-02	&(P	1.157E-01	3.46E-02	G K
		344.30	4.115E-03	% P	1.031E-01	3.02E-02	G
		1408.08	3.310E-02	& P	1.581E-01	4.55E-02	G
		964.00	7.435E-02	& P	3.566E-01	1.06E-01	G
		1112.07	3.079E-02	& P	3.452E-01	1.00E-01	G
		778.90	3.508E-02	% P	1.733E-01	5.00E-02	G
EU-154	8.8765E-03	123.10	8.877E-03	&(P	7.921E-02	2.37E-02	G K
		1274.80	3.715E-02	% P	1.193E-01	3.53E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
		723.30	5.504E-02	& P	2.032E-01	6.04E-02	G
		1004.80	3.493E-02	% P	2.239E-01	6.53E-02	G
EU-155	1.0014E-01						
		86.45	1.001E-01	%(	1.476E-01	4.50E-02	G K
		105.31	7.029E-02	% P	1.552E-01	4.70E-02	G
HG-203	-1.1696E-03						
		279.17	1.170E-03	&(P	3.950E-02	1.16E-02	G K
		72.87	5.685E-01	& P	1.206E+00	3.66E-01	G
		70.83	7.841E-01	&	2.011E+00	6.09E-01	G
		82.50	7.088E-01	&	2.382E+00	7.18E-01	G
TL-208	3.0517E-01						
		583.14	3.052E-01	*(P	3.776E-02	2.00E-02	G
		510.72	4.861E-01	+ P	1.522E-01	6.48E-02	G
PB-212	7.6152E-01						
		238.63	7.510E-01	(P	5.874E-02	2.79E-02	G K
							Energy duplication
		77.11	7.615E-01	}	2.259E-01	6.41E-02	G
		74.81	9.927E-01	+ P	4.221E-01	1.38E-01	G
PB-214	5.2947E-01						
		351.99	5.262E-01	(P	8.048E-02	3.85E-02	G K
		295.22	5.101E-01	(P	1.807E-01	7.73E-02	G
							Energy duplication
		77.11	1.934E-02	} P	4.629E-01	1.39E-01	G
		241.92	5.957E-01	(P	3.927E-01	1.25E-01	G
BI-212	6.3776E-01						
		727.17	6.378E-01	(P	3.121E-01	1.36E-01	G K
		1620.56	3.848E-01	& P	8.396E-01	2.53E-01	G
		785.42	1.590E+00	+ P	1.331E+00	4.85E-01	G
BI-214	4.8962E-01						
		609.32	4.685E-01	(P	7.869E-02	3.97E-02	G K
		1764.51	5.509E-01	*(P	5.791E-02	6.62E-02	G
		1120.28	6.188E-01	+ P	3.193E-01	1.40E-01	G
RA-224	6.4377E-01						
		241.00	6.438E-01	&(P	1.025E+00	3.12E-01	G
RA-226	1.4705E+00						
		185.99	1.470E+00	*(	8.273E-01	2.93E-01	G
AC-228	9.1367E-01						
		911.07	9.152E-01	(P	1.450E-01	8.01E-02	G K
		968.90	6.806E-01	- P	1.820E-01	7.56E-02	G
		338.40	9.100E-01	*(P	2.436E-01	1.04E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TH-227	-2.8771E-01						
		236.00	2.877E-01	?(P	3.867E-01	1.18E-01	G K
		256.25	3.725E-02	& P	4.068E-01	1.20E-01	G
PA-234	-3.4054E-02						
		98.44	3.405E-02	%(	1.455E-01	4.37E-02	G K
		946.00	2.806E-02	&	1.684E-01	4.90E-02	G
		131.28	9.958E-03	%	1.445E-01	4.30E-02	G
		94.67	5.681E-02	%	2.586E-01	7.77E-02	G
		883.24	0.000E+00	%	2.855E-01	8.15E-02	G
		926.70	1.023E-02	&	2.816E-01	8.01E-02	G
		569.26	9.253E-02	&	2.916E-01	8.70E-02	G
TH-234	1.0494E+00						
		63.29	6.015E-01	&(P	1.712E+00	5.15E-01	G K
		92.80	1.233E+00	(P	1.448E+00	4.43E-01	G
		92.38	1.515E+00	(P	1.721E+00	5.28E-01	G

AM-241 1.0478E-01 59.54 1.048E-01 %(P 2.106E-01 6.39E-02 G

(- This peak used in the nuclide activity average.

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

Nuclide Codes:

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

Peak Codes:

G - Gamma Ray
X - X-Ray
P - Positron Decay
S - Single-Escape
D - Double-Escape
K - Key Line
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 *****						
Time of Count		Time Corrected		Uncertainty		3 Sigma
Nuclide	Activity	Activity	Activity	Counting	Total	MDA
	pCi/gm	pCi/gm	pCi/gm	pCi/gm	pCi/gm	pCi/gm
BE-7 #A	6.4231E-02	6.8759E-02	2.6590E-01	2.6593E-01	2.792E-01	
K-40	1.5710E+01	1.5710E+01	1.2216E+00	1.5340E+00		
MN-54 #A	1.2276E-02	1.2420E-02	2.9268E-02	2.9277E-02	3.222E-02	
CO-57 #B	3.9600E-03	4.0137E-03	3.6058E-02	3.6059E-02	3.967E-02	
CO-60 #B	-3.0475E-03	-3.0532E-03	2.9029E-01	2.9029E-01	3.881E-02	
Sr-85 #A	-2.1851E-02	-2.3112E-02	4.1792E-02	4.1814E-02	4.337E-02	
Kr-85 #A	-5.3876E+02	-5.3878E+02	1.0361E+03	1.0366E+03	1.006E+03	
Y-88 #B	-1.0568E-03	-1.0935E-03	6.5609E-03	6.5612E-03	9.576E-03	
NB-94 #B	6.9392E-03	6.9392E-03	2.4982E-02	2.4985E-02	2.842E-02	
Ag-108M#B	8.2317E-04	8.2323E-04	5.5612E-02	5.5612E-02	6.295E-02	
CD-109 #A	3.5160E-02	3.5443E-02	1.2016E+00	1.2016E+00	1.327E+00	
SN-113 #B	-1.7809E-03	-1.8381E-03	1.6830E-01	1.6830E-01	4.245E-02	
SB-125 #F	9.3107E-02	9.3442E-02	6.9667E-02	6.9885E-02	8.964E-02	
I-131 #B	-3.0000E-03	-4.7163E-03	4.3011E-02	4.3012E-02	3.105E-02	
CS-134 #B	1.6282E-02	1.6361E-02	1.3400E-02	1.3435E-02	7.042E-02	
CS-137 #	9.0367E-02	9.0397E-02	6.2064E-02	6.2293E-02		
CE-139 #A	1.0223E-02	1.0497E-02	3.5893E-02	3.5898E-02	3.877E-02	
EU-152 #B	1.1390E-02	1.1399E-02	1.0380E-01	1.0380E-01	1.157E-01	
EU-154 #B	8.8662E-03	8.8765E-03	7.1003E-02	7.1005E-02	7.912E-02	
EU-155 #B	9.9938E-02	1.0014E-01	1.3510E-01	1.3521E-01	1.473E-01	
HG-203 #B	-1.0817E-03	-1.1696E-03	9.2565E-02	9.2565E-02	3.653E-02	
TL-208 #	3.0517E-01	3.0517E-01	5.9842E-02	6.2497E-02		
PB-212	7.6152E-01	7.6152E-01	8.4783E-02	9.5974E-02		
PB-214	5.2947E-01	5.2947E-01	1.1620E-01	1.2033E-01		
BI-212	6.3776E-01	6.3776E-01	4.0736E-01	4.0910E-01		
BI-214 #	4.8962E-01	4.8962E-01	1.0799E-01	1.1179E-01		
RA-224 #A	6.4377E-01	6.4377E-01	9.3720E-01	9.3797E-01	1.025E+00	
RA-226 #	1.4705E+00	1.4705E+00	8.7965E-01	8.8393E-01		
AC-228	9.1367E-01	9.1367E-01	1.9722E-01	2.0447E-01		
TH-227 #A	-2.8771E-01	-2.8771E-01	3.5667E-01	3.5708E-01	3.867E-01	
PA-234 #B	-3.4054E-02	-3.4054E-02	1.3117E-01	1.3118E-01	1.455E-01	
TH-234 #B	1.0494E+00	1.0494E+00	1.0407E+00	1.0423E+00	1.712E+00	
AM-241 #A	1.0478E-01	1.0478E-01	1.9172E-01	1.9181E-01	2.106E-01	

- All peaks for activity calculation had bad shape.
 * - Activity omitted from total
 & - Activity omitted from total and all peaks had bad shape.
 < - MDA value printed.
 A - Activity printed, but activity < MDA.
 B - Activity < MDA and failed test.
 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) 2.0907721E+01 pCi/gm
Total Decayed Activity (1120.2 to 2000.1 keV) 2.0907759E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
DAT

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab

Sample description
OOL-OOL-13-01-008-F

Spectrum Filename: C:\GammaVision\Spectra\107F_20JUL2006_1555.An1

Acquisition information

Start time: 20-Jul-2006 15:56:32
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: 1.7300E+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	18-Jul-2006 12:00:00
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	107_150K_28APR05.Pbc 01-May-2005 05:30:33
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 25 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.1882

***** S U M M A R Y O F P E A 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	374.	17.57	1.50	2.849E-02				
74.80	374.	17.57	1.50	2.849E-02	74.81	9.600	1.067E+00	PB212
77.09	668.	9.71	1.50	2.957E-02				
77.09	668.	9.71	1.50	2.957E-02	77.11	17.500	1.009E+00	PB212
					77.11	10.700	1.638E+00	PB214
77.09	664.	9.71	1.50	2.957E-02				
77.09	664.	9.71	1.50	2.957E-02	77.11	17.500	1.002E+00	PB212
					77.11	10.700	1.638E+00	PB214
84.14	121.	30.46	1.18	3.217E-02				
87.11	306.	12.92	1.19	3.302E-02	86.45	32.740	2.223E-01	EU155
					88.04	3.790	1.898E+00	CD109
90.15	187.	20.13	1.19	3.379E-02				
93.30	204.	18.69	1.19	3.449E-02	92.38	2.570	1.736E+00	TH234
					92.80	3.000	1.394E+00	TH234
128.69	152.	28.38	1.46	3.817E-02				
186.75	291.	16.22	1.16	3.605E-02	185.99	3.280	1.917E+00	RA226
208.91	201.	24.61	1.47	3.432E-02				
238.74	1889.	2.63	1.30	3.189E-02	238.63	43.100	1.064E+00	PB212
241.48	239.	19.12	1.30	3.167E-02	241.00	3.900	1.493E+00	RA224
269.99	157.	24.86	1.32	2.946E-02				
277.65	91.	27.84	1.19	2.890E-02				
295.37	350.	7.69	1.34	2.766E-02	295.22	19.200	5.086E-01	PB214
300.41	96.	22.56	1.34	2.732E-02				
328.12	94.	23.55	1.28	2.560E-02				
338.55	420.	9.15	1.35	2.499E-02	338.40	12.010	1.084E+00	AC228
352.01	562.	6.12	1.31	2.426E-02	351.99	37.100	4.830E-01	PB214
463.07	144.	17.89	1.30	1.954E-02				

463.07	144.	17.89	1.30	1.954E-02	463.51	10.000	5.676E-01	SB125
510.86	317.	11.38	1.74	1.808E-02	510.72	22.500	5.440E-01	TL208
583.31	665.	5.57	1.36	1.629E-02	583.14	86.000	3.684E-01	TL208
609.47	428.	6.51	1.49	1.574E-02	609.32	46.090	4.559E-01	BI214
661.92	89.	31.55	1.09	1.477E-02	661.62	84.620	5.317E-02	CS137
727.22	185.	15.26	1.64	1.374E-02	727.17	11.800	8.849E-01	BI212
767.99	90.	33.00	0.98	1.319E-02				
784.33	61.	31.69	0.73	1.297E-02	785.42	2.000	1.830E+00	BI212
794.86	87.	25.26	1.73	1.285E-02				
794.86	87.	25.26	1.73	1.285E-02	795.76	85.400	6.201E-02	CS134
860.92	102.	18.11	1.64	1.211E-02				
911.42	411.	5.92	1.82	1.160E-02	911.07	29.000	9.448E-01	AC228
964.80	87.	15.29	1.80	1.113E-02	964.00	14.580	4.174E-01	EU152
969.20	237.	7.61	1.80	1.109E-02	968.90	17.460	9.458E-01	AC228

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
1120.29	140.	17.79	1.39	9.970E-03	1120.28	15.040	7.247E-01	BI214
1460.96	1855.	2.35	1.99	8.190E-03	1460.75	10.700	1.649E+01	K40
1621.04	38.	22.19	1.39	7.569E-03	1620.56	2.750	1.418E+00	BI212
1765.03	97.	11.79	1.39	7.084E-03	1764.51	15.920	6.698E-01	BI214

***** 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

179.08	90.17	636.	170.	0.085	67.08	1.189 PB-214 D
185.37	93.31	626.	201.	0.101	56.85	1.191 U-235 D
257.04	128.69	771.	160.	0.080	77.21	1.460 AC-228 s
417.45	208.91	771.	201.	0.100	73.84	1.474 AC-228 s
477.11	238.73	286.	1889.	0.944	7.88	1.297 PB-212 D
482.58	241.47	920.	239.	0.119	57.36	1.299 PB-214 D
539.61	269.99	469.	157.	0.078	74.58	1.324 AC-228 s
554.92	277.65	263.	91.	0.046	81.79	1.191 NP-239
600.57	300.48	276.	88.	0.044	91.21	1.244 PB-212
655.85	328.12	188.	94.	0.047	70.64	1.276 AC-228
1323.42	661.92	192.	89.	0.044	94.64	1.095 CS-137 l
1535.55	767.99	198.	90.	0.045	73.48	0.981 BI-214 s
1721.40	860.92	78.	102.	0.051	54.33	1.643 TL-208 s
1929.81	964.86	49.	82.	0.041	49.12	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	Centroid	Background	Net Area	Intensity	Uncert	FWHM
	Channel	Energy	Counts	Counts	Cts/Sec	3 Sigma %	keV

PB-212	149.26	74.80	2015.	374.	0.187	52.72	1.500s
PB-212	153.89	77.11	1773.	668.	0.334	29.14	1.500D
PB-214	153.89	77.11	1778.	664.	0.332	29.14	1.500D
EU-155	174.20	87.27	1626.	228.	0.114	77.60	1.500
CD-109	175.74	88.04	745.	251.	0.125	49.82	1.187D
TH-234	185.93	93.13	1478.	176.	0.088	85.44	1.500s
RA-226	373.15	186.75	742.	291.	0.145	48.65	1.157s
PB-212	477.06	238.72	800.	1592.	0.796	10.52	1.500
RA-224	482.56	241.47	1006.	143.	0.071	95.99	1.500
PB-214	590.35	295.36	399.	328.	0.164	30.22	1.500
AC-228	676.72	338.55	355.	417.	0.208	27.44	1.349

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
PB-214	703.67	352.03	254.	545.	0.272	17.66	1.500
SB-125	925.99	463.20	161.	113.	0.057	53.67	1.500
TL-208	1021.32	510.86	280.	283.	0.142	34.14	1.744s
TL-208	1166.21	583.31	196.	661.	0.330	16.72	1.358
BI-214	1218.53	609.47	134.	423.	0.212	19.54	1.485
BI-212	1454.02	727.22	176.	184.	0.092	45.79	1.637s
BI-212	1568.22	784.33	109.	61.	0.030	95.07	0.730s
CS-134	1589.49	794.96	104.	47.	0.024	100.76	1.684
AC-228	1822.41	911.42	80.	407.	0.204	17.76	1.821
EU-152	1928.78	964.61	161.	87.	0.044	69.59	1.796
AC-228	1937.36	968.90	52.	234.	0.117	23.24	1.799D
BI-214	2240.15	1120.29	121.	139.	0.070	53.36	1.392s
K-40	2921.52	1460.96	21.	1850.	0.925	7.05	1.991
BI-212	3241.70	1621.04	9.	38.	0.019	66.57	1.393s
BI-214	3529.71	1765.03	8.	97.	0.048	35.37	1.394s

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

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****							
- Nuclide -	Average	----- Peak -----					
Name Code	Activity	Energy	Activity	Code	MDA	Value	COMMENTS
	pCi/gm	keV	pCi/gm		pCi/gm		
BE-7	6.1503E-02	477.56	6.150E-02	%(	2.907E-01	8.63E-02	G
K-40	1.6491E+01	1460.75	1.649E+01	(P	2.132E-01	3.89E-01	G
MN-54	-3.7349E-03	834.81	-3.735E-03	&(P	2.962E-02	8.58E-03	G
CO-57	3.8378E-03	122.07	3.838E-03	&(P	3.515E-02	1.05E-02	G K
		136.43	-9.843E-03	& P	3.199E-01	9.56E-02	G
CO-60	7.7539E-03	1332.51	7.754E-03	%(P	2.918E-02	8.36E-03	G K
		1173.23	-3.852E-03	% P	3.319E-02	9.13E-03	G K
Sr-85	-1.5209E-02	514.00	-1.521E-02	%(	3.882E-02	1.17E-02	G
Kr-85	-3.7309E+02	513.99	-3.731E+02	%(P	8.795E+02	2.64E+02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
Y-88	-2.5271E-03	1836.01-2.527E-03	% (P 2.547E-02 6.75E-03 G K				
		898.02-8.148E-03	% P 3.865E-02 1.13E-02 G				
NB-94	3.1717E-03	871.10 3.172E-03	% (P 2.766E-02 7.99E-03 G K				
		702.50-7.546E-03	& P 3.311E-02 9.78E-03 G K				
Ag-108M	3.6062E-03	722.95 3.606E-03	& (2.409E-02 6.96E-03 G K				
		614.37-1.574E-02	% 3.243E-02 9.84E-03 G				
		433.93-8.983E-03	% P 2.922E-02 8.69E-03 G				
CD-109	1.5598E+00	88.04 1.560E+00	(P 8.075E-01 2.59E-01 G				
SN-113	-3.6555E-03	391.71-3.655E-03	% (P 4.143E-02 1.21E-02 G K				
		255.04 7.755E-04	& 1.381E+00 4.09E-01 G				
SB-125	1.3201E-01	427.95 2.318E-02	% (P 7.901E-02 2.35E-02 G K				
		600.77 1.929E-02	% P 1.578E-01 4.62E-02 G				
		636.15-4.173E-02	% P 2.506E-01 7.33E-02 G				
		463.51 4.542E-01	(P 2.475E-01 8.33E-02 G				
		176.29-1.037E-02	& P 4.748E-01 1.41E-01 G				
I-131	-5.9639E-03	364.48-5.964E-03	% (3.966E-02 1.18E-02 G K				
		636.97 0.000E+00	& 4.620E-01 1.33E-01 G				
		284.29 5.761E-02	& 5.573E-01 1.66E-01 G				
CS-134	1.4032E-02	604.66-3.058E-03	& (P 6.875E-02 2.05E-02 G K				
		795.76 3.356E-02	? (P 3.590E-02 1.14E-02 G				
		569.29-6.170E-05	% 1.801E-01 5.22E-02 G				
		801.84 3.617E-02	% P 3.278E-01 9.50E-02 G				
CS-137	2.3771E-02	661.62 2.377E-02	% (P 4.074E-02 1.24E-02 G				
CE-139	-7.7544E-03	165.85-7.754E-03	% (P 3.823E-02 1.15E-02 G				
EU-152	1.5232E-01	121.78 1.943E-02	& (P 1.043E-01 3.13E-02 G K				
		344.30-1.631E-02	% P 9.588E-02 2.84E-02 G				

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
		1408.08	7.801E-02	% P	1.262E-01	3.91E-02	G
		964.00	4.188E-01	& (P	2.975E-01	9.73E-02	G
		1112.07	3.875E-02	& P	2.609E-01	7.58E-02	G
		778.90	3.108E-03	% P	2.865E-01	8.32E-02	G
EU-154	-1.1242E-03						
		123.10	-1.124E-03	& (P	8.449E-02	2.52E-02	G K
		1274.80	-3.690E-02	% P	1.210E-01	3.59E-02	G
		723.30	1.541E-02	& P	3.496E-01	1.04E-01	G
		1004.80	7.809E-02	& P	1.814E-01	5.47E-02	G
EU-155	1.6583E-01						
		86.45	1.658E-01	(	1.386E-01	4.29E-02	G K
		105.31	5.546E-02	% P	1.639E-01	4.95E-02	G
HG-203	-4.8604E-04						
		279.17	-4.860E-04	& (P	3.175E-02	9.34E-03	G K
		72.87	-2.048E-01	% P	9.713E-01	2.92E-01	G
		70.83	9.014E-01	&	1.375E+00	4.20E-01	G
		82.50	-1.062E+00	%	2.194E+00	6.66E-01	G
TL-208	3.6842E-01						
		583.14	3.684E-01	(P	3.791E-02	2.07E-02	G
		510.72	5.440E-01	+ P	1.548E-01	6.93E-02	G
PB-212	9.5261E-01						
		238.63	9.044E-01	(P	7.642E-02	3.20E-02	G K
							Energy duplication
		77.11	1.009E+00	@ (	3.003E-01	9.80E-02	G
		74.81	1.067E+00	& (P	6.051E-01	1.89E-01	G
PB-214	4.7590E-01						
		351.99	4.728E-01	(P	6.679E-02	2.81E-02	G K
		295.22	4.818E-01	(P	1.407E-01	4.92E-02	G
							Energy duplication
		77.11	1.638E+00	+ P	4.917E-01	1.60E-01	G
		241.92	1.812E-01	% P	5.146E-01	1.55E-01	G
BI-212	8.8492E-01						
		727.17	8.849E-01	@ (P	3.111E-01	1.36E-01	G K
		1620.56	1.418E+00	+ P	6.322E-01	3.19E-01	G
		785.42	1.830E+00	+ P	1.549E+00	5.91E-01	G
BI-214	4.5591E-01						
		609.32	4.559E-01	(P	6.089E-02	3.00E-02	G K
		1764.51	6.698E-01	+ P	1.117E-01	7.97E-02	G
		1120.28	7.247E-01	+ P	2.810E-01	1.30E-01	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
RA-224	9.0208E-01	241.00	9.021E-01	?(P	9.510E-01	2.93E-01	G
RA-226	1.9170E+00	185.99	1.917E+00	@(	8.555E-01	3.11E-01	G
AC-228	9.7337E-01	911.07	9.448E-01	(P	1.029E-01	5.65E-02	G K
		968.90	9.446E-01	(P	1.462E-01	7.39E-02	G
		338.40	1.084E+00	(P	2.355E-01	1.00E-01	G
TH-227	-1.7318E-01	236.00	-1.732E-01	%(P	3.295E-01	1.00E-01	G K
		256.25	-3.260E-02	& P	4.093E-01	1.21E-01	G
PA-234	1.8332E-02	98.44	1.833E-02	%(	1.376E-01	4.12E-02	G K
		946.00	-2.463E-02	%	1.786E-01	5.22E-02	G
		131.28	-2.334E-02	&	1.765E-01	5.29E-02	G
		94.67	-1.915E-01	%	2.803E-01	8.55E-02	G
		883.24	-5.386E-04	%	2.406E-01	6.85E-02	G
		926.70	3.690E-02	%	2.420E-01	7.00E-02	G
		569.26	-4.882E-05	%	2.588E-01	7.48E-02	G
TH-234	9.8421E-01	63.29	7.149E-01	%(P	1.815E+00	5.48E-01	G K
		92.80	1.334E+00	(P	1.377E+00	4.23E-01	G
		92.38	-1.178E-01	% P	1.702E+00	5.09E-01	G
AM-241	-4.1704E-02	59.54	-4.170E-02	&(P	2.364E-01	7.10E-02	G

(- This peak used in the nuclide activity average.

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

P - Peakbackground subtraction
} - Peak is too close to another for the activity
to be found directly.

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

***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****						
Time of Count		Time Corrected		Uncertainty		3 Sigma
Nuclide	Activity	Activity	Counting	Total	MDA	
	pCi/gm	pCi/gm	pCi/gm	pCi/gm	pCi/gm	
BE-7 #A	5.9799E-02	6.1503E-02	2.5902E-01	2.5905E-01	2.827E-01	
K-40	1.6491E+01	1.6491E+01	1.1664E+00	1.5196E+00		
MN-54 #A	-3.7170E-03	-3.7349E-03	2.9768E-02	2.9769E-02	2.948E-02	
CO-57 #B	3.8165E-03	3.8378E-03	3.1536E-02	3.1537E-02	3.496E-02	
CO-60 #B	7.7479E-03	7.7539E-03	2.5080E-02	2.5084E-02	2.916E-02	
Sr-85 #A	-1.4861E-02	-1.5209E-02	3.5120E-02	3.5132E-02	3.793E-02	
Kr-85 #A	-3.7308E+02	-3.7309E+02	9.3178E+02	9.3204E+02	8.795E+02	
Y-88 #B	-2.4918E-03	-2.5271E-03	4.4427E-02	4.4427E-02	2.512E-02	
NB-94 #B	3.1717E-03	3.1717E-03	2.3956E-02	2.3957E-02	2.766E-02	
Ag-108M#B	3.6061E-03	3.6062E-03	2.0884E-02	2.0885E-02	2.409E-02	
CD-109	1.5547E+00	1.5598E+00	7.7807E-01	7.8286E-01		
SN-113 #B	-3.6081E-03	-3.6555E-03	6.3903E-02	6.3904E-02	4.090E-02	
SB-125 #F	1.3182E-01	1.3201E-01	7.2607E-02	7.3024E-02	7.890E-02	
I-131 #B	-4.9488E-03	-5.9639E-03	3.5271E-02	3.5273E-02	3.291E-02	
CS-134 #B	1.4004E-02	1.4032E-02	1.4297E-02	1.4321E-02	6.861E-02	
CS-137 #A	2.3768E-02	2.3771E-02	3.7217E-02	3.7244E-02	4.074E-02	
CE-139 #A	-7.6703E-03	-7.7544E-03	3.5224E-02	3.5227E-02	3.782E-02	
EU-152 #F	1.5227E-01	1.5232E-01	1.0616E-01	1.0650E-01	1.043E-01	
EU-154 #B	-1.1236E-03	-1.1242E-03	1.2468E-01	1.2468E-01	8.445E-02	
EU-155 #	1.6569E-01	1.6583E-01	1.2868E-01	1.2901E-01	1.385E-01	
HG-203 #B	-4.7064E-04	-4.8604E-04	6.3842E-01	6.3842E-01	3.075E-02	
TL-208	3.6842E-01	3.6842E-01	6.2017E-02	6.5724E-02		
PB-212 #	9.5261E-01	9.5261E-01	1.0118E-01	1.1577E-01	7.642E-02	
PB-214 #	4.7590E-01	4.7590E-01	8.4334E-02	8.8894E-02	6.679E-02	
BI-212	8.8492E-01	8.8492E-01	4.0809E-01	4.1142E-01		
BI-214	4.5591E-01	4.5591E-01	9.0009E-02	9.3951E-02		
RA-224 #A	9.0208E-01	9.0208E-01	8.7945E-01	8.8106E-01	9.510E-01	
RA-226 #	1.9170E+00	1.9170E+00	9.3261E-01	9.3946E-01		
AC-228	9.7337E-01	9.7337E-01	1.3128E-01	1.4332E-01		
TH-227 #B	-1.7318E-01	-1.7318E-01	3.0236E-01	3.0253E-01	3.295E-01	

PA-234 #B	1.8332E-02	1.8332E-02	1.2366E-01	1.2366E-01	1.376E-01
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TH-234 #B	9.8421E-01	9.8421E-01	9.3502E-01	9.3661E-01	1.815E+00
AM-241 #A	-4.1704E-02	-4.1704E-02	2.2192E-01	2.2193E-01	2.364E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
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) 2.2644987E+01 pCi/gm
Total Decayed Activity (1120.2 to 2000.1 keV) 2.2650145E+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-13-01-016-F-B

Spectrum Filename: C:\GammaVision\Spectra\107F_20JUL2006_1635.An1

Acquisition information

Start time: 20-Jul-2006 16:35:07
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: 1.9100E+03
Activity scaling factor: 1.0000E+06/(1.0000E+00* 1.9100E+03) =
 5.2356E+02
Detection limit method: Nureg 4.16
Random error: 1.0000000E+00
Systematic error: 1.0000000E+00

Fraction Limit:	0.000%
Background width:	average of five points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	18-Jul-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. 26 cutoff 20.00000 %
Energy Calibration
Normalized diff: 0.1284

***** S U M M A R Y O F P E A 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	378.	17.32	1.50	2.849E-02				
74.84	378.	17.32	1.50	2.849E-02	74.81	9.600	9.789E-01	PB212
76.99	587.	10.94	1.50	2.957E-02				
76.99	587.	10.94	1.50	2.957E-02	77.11	17.500	8.025E-01	PB212
					77.11	10.700	1.302E+00	PB214
76.99	582.	10.94	1.50	2.957E-02				
76.99	582.	10.94	1.50	2.957E-02	77.11	17.500	7.960E-01	PB212
					77.11	10.700	1.302E+00	PB214
83.89	120.	31.48	1.18	3.214E-02				
87.15	283.	14.12	1.19	3.307E-02	86.45	32.740	1.862E-01	EU155
					88.04	3.790	1.590E+00	CD109
90.01	208.	18.68	1.19	3.379E-02				
93.47	255.	15.53	1.19	3.456E-02	92.38	2.570	1.986E+00	TH234
					92.80	3.000	1.616E+00	TH234
128.89	152.	37.89	1.21	3.818E-02				
185.98	190.	25.46	0.84	3.610E-02	185.99	3.280	1.136E+00	RA226
208.91	215.	20.93	1.52	3.432E-02				
238.78	1832.	2.70	1.30	3.189E-02	238.63	43.100	9.346E-01	PB212
242.12	214.	15.80	1.30	3.162E-02	241.00	3.900	1.212E+00	RA224
					241.92	7.470	6.367E-01	PB214
270.79	146.	23.09	1.29	2.940E-02				
295.40	338.	7.92	1.34	2.766E-02	295.22	19.200	4.435E-01	PB214
300.45	119.	18.27	1.34	2.732E-02				
328.18	137.	27.39	1.36	2.559E-02				
338.37	374.	11.40	1.30	2.500E-02	338.40	12.010	8.741E-01	AC228
352.05	551.	8.13	1.33	2.426E-02	351.99	37.100	4.295E-01	PB214
411.09	72.	38.65	0.85	2.148E-02				

463.07	147.	18.09	1.59	1.954E-02				
463.07	147.	18.09	1.59	1.954E-02	463.51	10.000	5.239E-01	SB125
511.02	246.	12.73	1.54	1.807E-02	510.72	22.500	3.693E-01	TL208
562.78	57.	29.78	1.29	1.675E-02				
583.36	554.	6.85	1.38	1.629E-02	583.14	86.000	2.775E-01	TL208
609.59	476.	7.04	1.54	1.574E-02	609.32	46.090	4.596E-01	BI214
662.06	85.	29.50	1.05	1.476E-02	661.62	84.620	4.635E-02	CS137
727.44	189.	17.29	1.45	1.374E-02	727.17	11.800	8.207E-01	BI212
770.06	72.	30.28	0.92	1.316E-02				
785.37	60.	29.44	0.90	1.297E-02	785.42	2.000	1.603E+00	BI212
794.90	120.	19.81	1.47	1.285E-02				
794.90	120.	19.81	1.47	1.285E-02	795.76	85.400	7.756E-02	CS134
861.01	98.	18.28	1.86	1.210E-02				
911.37	415.	7.27	1.84	1.161E-02	911.07	29.000	8.635E-01	AC228
964.78	87.	15.42	1.80	1.113E-02				
969.29	239.	7.77	1.80	1.109E-02	968.90	17.460	8.633E-01	AC228
1109.10	25.	39.40	1.15	1.004E-02				

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
1120.68	150.	19.76	2.08	9.967E-03	1120.28	15.040	7.055E-01	BI214
1461.09	1962.	2.33	2.00	8.190E-03	1460.75	10.700	1.580E+01	K40
1620.96	46.	19.62	0.77	7.569E-03	1620.56	2.750	1.560E+00	BI212
1764.95	95.	11.12	2.17	7.084E-03	1764.51	15.920	5.979E-01	BI214

***** 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

167.45	84.05	659.	120.	0.060	94.44	1.184 TA-182 1D
179.07	90.17	704.	154.	0.077	76.93	1.189 PB-214 D
186.00	93.63	633.	281.	0.140	42.07	1.191 U-235 D
257.43	128.89	1143.	173.	0.086	86.07	1.209 AC-228
417.47	208.91	696.	215.	0.108	62.78	1.524 AC-228 s
477.19	238.66	304.	1832.	0.916	8.09	1.297 PB-212 D
483.86	242.00	465.	214.	0.107	47.39	1.299 PB-214 D
541.21	270.79	396.	146.	0.073	69.26	1.293 AC-228 s
600.63	300.50	259.	90.	0.045	85.83	1.017 PB-212
655.98	328.18	407.	137.	0.068	82.16	1.357 AC-228
821.77	411.09	239.	72.	0.036	115.95	0.849 EU-152 s
1125.14	562.78	100.	57.	0.028	84.54	1.292 AS-76 s
1539.68	770.06	128.	72.	0.036	75.00	0.917 BI-214 s
1721.59	861.01	79.	98.	0.049	54.84	1.862 TL-208
1929.84	964.80	48.	88.	0.044	46.43	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	Centroid	Background	Net Area	Intensity	Uncert	FWHM
	Channel	Energy	Counts	Counts	Cts/Sec	3 Sigma %	keV

PB-212	149.29	74.81	2005.	378.	0.189	51.95	1.500D
PB-212	153.89	77.11	1767.	587.	0.294	32.81	1.500D
PB-214	153.89	77.11	1772.	582.	0.291	32.81	1.500D
EU-155	174.15	87.24	1749.	204.	0.102	89.44	1.500
CD-109	175.74	88.04	745.	225.	0.112	55.19	1.187D
TH-234	185.83	93.08	1540.	244.	0.122	65.45	1.500
RA-226	371.60	185.98	829.	190.	0.095	76.38	0.843
PB-212	477.10	238.74	781.	1502.	0.751	10.91	1.500
RA-224	483.15	241.76	952.	170.	0.085	79.26	1.500
PB-214	590.36	295.37	432.	296.	0.148	33.94	1.500

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
AC-228	676.36	338.37	428.	371.	0.185	34.19	1.304
PB-214	703.74	352.06	272.	518.	0.259	18.64	1.500
SB-125	926.02	463.21	190.	118.	0.059	55.26	1.500
TL-208	1021.63	511.02	250.	212.	0.106	38.18	1.537s
TL-208	1166.31	583.36	227.	549.	0.275	20.56	1.384
BI-214	1218.75	609.59	184.	471.	0.236	21.12	1.537s
CS-137	1323.69	662.06	175.	82.	0.041	88.49	1.053s
BI-212	1454.46	727.44	202.	188.	0.094	51.86	1.452
BI-212	1570.30	785.37	85.	59.	0.029	88.32	0.896s
CS-134	1590.02	795.23	97.	83.	0.042	59.44	1.684s
AC-228	1822.31	911.37	125.	411.	0.205	21.81	1.835
AC-228	1937.36	968.90	69.	231.	0.115	24.65	1.799D
BI-214	2240.93	1120.68	167.	150.	0.075	59.29	2.083s
K-40	2921.78	1461.09	31.	1958.	0.979	6.99	1.996
BI-212	3241.54	1620.96	8.	46.	0.023	58.86	0.773s
BI-214	3529.56	1764.95	5.	95.	0.048	33.36	2.165s

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

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

- Nuclide -		Average	----- Peak -----				
Name	Code	Activity	Energy	Activity	Code	MDA Value	COMMENTS
		pCi/gm	keV	pCi/gm		pCi/gm	
BE-7		9.8069E-02					
			477.56	9.807E-02	%(	2.228E-01 6.73E-02	G
K-40		1.5804E+01					
			1460.75	1.580E+01	(P	2.324E-01 3.69E-01	G
MN-54		-1.7331E-02					
			834.81	-1.733E-02	&(P	3.471E-02 1.05E-02	G
CO-57		-8.6040E-03					
			122.07	-8.604E-03	&(P	3.178E-02 9.56E-03	G K
			136.43	1.986E-02	& P	2.838E-01 8.49E-02	G
CO-60		-3.0370E-03					
			1332.51	-3.037E-03	&(P	3.428E-02 9.48E-03	G K
			1173.23	3.261E-03	% P	3.986E-02 1.15E-02	G K
Sr-85		-1.4826E-02					
			514.00	-1.483E-02	&(	3.415E-02 1.03E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
Kr-85	-3.6227E+02	513.99	3.623E+02	&(P	7.746E+02	2.33E+02	G
Y-88	-2.2692E-03	1836.01	2.269E-03	&(P	2.495E-02	6.68E-03	G K
		898.02	9.904E-03	% P	3.132E-02	9.22E-03	G
NB-94	6.6983E-03	871.10	6.698E-03	%(P	2.600E-02	7.66E-03	G K
		702.50	7.156E-03	% P	2.522E-02	7.48E-03	G K
Ag-108M	9.8490E-04	722.95	9.849E-04	%(	3.018E-02	8.72E-03	G K
		614.37	2.077E-02	%	3.865E-02	1.18E-02	G
		433.93	2.951E-03	& P	2.453E-02	7.19E-03	G
CD-109	1.2654E+00	88.04	1.265E+00	(P	7.314E-01	2.33E-01	G
SN-113	-1.3501E-03	391.71	1.350E-03	&(P	3.703E-02	1.08E-02	G K
		255.04	1.760E-03	%	1.242E+00	3.68E-01	G
SB-125	1.0350E-01	427.95	6.174E-03	%(P	7.712E-02	2.25E-02	G K
		600.77	3.672E-03	% P	1.268E-01	3.63E-02	G
		636.15	9.676E-03	& P	2.299E-01	6.64E-02	G
		463.51	4.281E-01	(P	2.429E-01	8.07E-02	G
		176.29	6.879E-02	% P	4.457E-01	1.33E-01	G
I-131	-1.0249E-03	364.48	1.025E-03	&(	3.336E-02	9.79E-03	G K
		636.97	2.941E-03	%	4.405E-01	1.27E-01	G
		284.29	1.601E-01	%	4.501E-01	1.35E-01	G
CS-134	2.3444E-02	604.66	3.276E-03	%(P	6.053E-02	1.80E-02	G K
		795.76	5.398E-02	*(P	3.144E-02	1.08E-02	G
		569.29	8.053E-04	&	1.668E-01	4.84E-02	G
		801.84	1.021E-02	% P	2.776E-01	7.92E-02	G
CS-137	4.6346E-02	661.62	4.635E-02	(P	3.645E-02	1.43E-02	G
CE-139	6.7653E-03	165.85	6.765E-03	&(P	2.679E-02	8.03E-03	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
EU-152	-2.5686E-02	121.78	2.569E-02	% (P	9.614E-02	2.89E-02	G K
		344.30	4.819E-02	& P	6.916E-02	2.13E-02	G
		1408.08	4.320E-02	% P	1.100E-01	3.27E-02	G
		964.00	8.142E-03	& P	2.271E-01	6.56E-02	G
		1112.07	2.497E-02	& P	2.714E-01	7.86E-02	G
		778.90	2.472E-02	% P	1.987E-01	5.75E-02	G
EU-154	2.7306E-03	123.10	2.731E-03	& (P	6.972E-02	2.08E-02	G K
		1274.80	2.747E-02	% P	1.033E-01	3.05E-02	G
		723.30	1.152E-03	& P	3.036E-01	8.99E-02	G
		1004.80	5.708E-02	% P	1.760E-01	5.24E-02	G
EU-155	1.3442E-01	86.45	1.344E-01	(	1.301E-01	4.01E-02	G K
		105.31	4.135E-02	% P	1.508E-01	4.54E-02	G
HG-203	-6.2138E-04	279.17	6.214E-04	% (P	3.343E-02	9.88E-03	G K
		72.87	5.312E-01	% P	1.001E+00	3.04E-01	G
		70.83	3.047E-02	&	1.685E+00	5.05E-01	G
		82.50	5.228E-01	%	1.975E+00	5.95E-01	G
TL-208	2.7749E-01	583.14	2.775E-01	(P	3.679E-02	1.92E-02	G
		510.72	3.693E-01	+ P	1.328E-01	5.45E-02	G
PB-212	7.8142E-01	238.63	7.729E-01	(P	6.841E-02	2.84E-02	G K
							Energy duplication
		77.11	8.025E-01	@(	2.715E-01	8.78E-02	G
							Energy duplication
PB-214	4.0281E-01	74.81	9.789E-01	+ P	5.467E-01	1.71E-01	G
		351.99	4.073E-01	(P	6.253E-02	2.56E-02	G K
		295.22	3.941E-01	(P	1.326E-01	4.53E-02	G
							Energy duplication
BI-212	8.2072E-01	77.11	1.302E+00	+ P	4.446E-01	1.44E-01	G
		241.92	2.985E-01	% P	4.788E-01	1.46E-01	G
		727.17	8.207E-01	(P	3.007E-01	1.43E-01	G K
		1620.56	1.560E+00	+ P	5.430E-01	3.10E-01	G
BI-214	4.5956E-01	785.42	1.603E+00	+ P	1.248E+00	4.82E-01	G
		609.32	4.596E-01	@(P	6.424E-02	3.27E-02	G K
		1764.51	5.979E-01	+ P	8.036E-02	6.71E-02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
		1120.28	7.055E-01	+ P	2.973E-01	1.40E-01	G
RA-224	9.7309E-01	241.00	9.731E-01	(P	8.383E-01	2.60E-01	G
RA-226	1.1364E+00	185.99	1.136E+00	(	8.178E-01	2.89E-01	G
AC-228	8.5968E-01	911.07	8.635E-01	(P	1.153E-01	6.34E-02	G K
		968.90	8.434E-01	(P	1.515E-01	7.00E-02	G
		338.40	8.741E-01	(P	2.335E-01	1.00E-01	G
TH-227	-6.7519E-02	236.00	-6.752E-02	%(P	3.058E-01	9.19E-02	G K
		256.25	5.476E-02	% P	3.646E-01	1.09E-01	G
PA-234	1.0351E-03	98.44	1.035E-03	%(	1.354E-01	4.04E-02	G K
		946.00	-3.494E-02	%	1.527E-01	4.50E-02	G
		131.28	-2.015E-02	%	1.539E-01	4.62E-02	G
		94.67	-1.151E-01	%	2.471E-01	7.49E-02	G
		883.24	1.026E-01	%	2.017E-01	6.14E-02	G
		926.70	-2.638E-02	%	2.777E-01	8.06E-02	G
		569.26	4.938E-04	&	2.392E-01	6.92E-02	G
TH-234	1.0589E+00	63.29	5.872E-01	%(P	1.640E+00	4.94E-01	G K
		92.80	1.672E+00	(P	1.273E+00	3.94E-01	G
		92.38	-1.324E-01	& P	1.530E+00	4.57E-01	G
AM-241	-6.9321E-05	59.54	-6.932E-05	%(P	1.974E-01	5.89E-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 *****						
Time of Count		Time Corrected		Uncertainty		3 Sigma
Nuclide	Activity	Activity	Counting	Total	MDA	
	pCi/gm	pCi/gm	pCi/gm	pCi/gm	pCi/gm	
BE-7 #A	9.5448E-02	9.8069E-02	2.0200E-01	2.0208E-01	2.169E-01	
K-40	1.5804E+01	1.5804E+01	1.1072E+00	1.4481E+00		
MN-54 #A	-1.7251E-02	-1.7331E-02	3.2482E-02	3.2498E-02	3.455E-02	
CO-57 #B	-8.5581E-03	-8.6040E-03	2.9093E-02	2.9097E-02	3.161E-02	
CO-60 #B	-3.0347E-03	-3.0370E-03	2.1406E-01	2.1406E-01	3.425E-02	
Sr-85 #A	-1.4498E-02	-1.4826E-02	3.0976E-02	3.0988E-02	3.340E-02	
Kr-85 #A	-3.6227E+02	-3.6227E+02	8.1366E+02	8.1394E+02	7.746E+02	
Y-88 #B	-2.2386E-03	-2.2692E-03	4.4308E-02	4.4308E-02	2.461E-02	
NB-94 #B	6.6983E-03	6.6983E-03	2.2992E-02	2.2995E-02	2.600E-02	
Ag-108M#B	9.8487E-04	9.8490E-04	2.6171E-02	2.6171E-02	3.017E-02	
CD-109	1.2614E+00	1.2654E+00	6.9941E-01	7.0292E-01		
SN-113 #B	-1.3333E-03	-1.3501E-03	1.6509E-01	1.6509E-01	3.657E-02	
SB-125 #F	1.0335E-01	1.0350E-01	5.8559E-02	5.8877E-02	7.701E-02	
I-131 #B	-8.5618E-04	-1.0249E-03	2.9355E-02	2.9355E-02	2.787E-02	
CS-134 #B	2.3399E-02	2.3444E-02	1.4024E-02	1.4092E-02	6.042E-02	
CS-137	4.6340E-02	4.6346E-02	4.2781E-02	4.2868E-02		
CE-139 #A	6.6945E-03	6.7653E-03	2.4101E-02	2.4105E-02	2.651E-02	
EU-152 #B	-2.5678E-02	-2.5686E-02	8.7396E-02	8.7408E-02	9.611E-02	
EU-154 #B	2.7293E-03	2.7306E-03	6.2419E-02	6.2419E-02	6.968E-02	
EU-155 #	1.3431E-01	1.3442E-01	1.2022E-01	1.2045E-01	1.300E-01	
HG-203 #B	-6.0239E-04	-6.2138E-04	1.3887E-01	1.3887E-01	3.241E-02	
TL-208	2.7749E-01	2.7749E-01	5.7533E-02	5.9822E-02		
PB-212 #	7.8142E-01	7.8142E-01	8.6181E-02	9.7760E-02	6.841E-02	
PB-214 #	4.0281E-01	4.0281E-01	7.5816E-02	7.9461E-02	6.253E-02	
BI-212	8.2072E-01	8.2072E-01	4.2855E-01	4.3129E-01		
BI-214 #	4.5956E-01	4.5956E-01	9.7967E-02	1.0166E-01		
RA-224 #	9.7309E-01	9.7309E-01	7.8142E-01	7.8353E-01	8.383E-01	
RA-226	1.1364E+00	1.1364E+00	8.6803E-01	8.7062E-01		
AC-228	8.5968E-01	8.5968E-01	1.3726E-01	1.4635E-01		

TH-227 #B	-6.7519E-02	-6.7519E-02	2.8014E-01	2.8017E-01	3.058E-01
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PA-234 #B	1.0351E-03	1.0351E-03	1.2132E-01	1.2132E-01	1.354E-01
TH-234 #B	1.0589E+00	1.0589E+00	7.4912E-01	7.5141E-01	1.640E+00
AM-241 #A	-6.9321E-05	-6.9321E-05	2.1141E-01	2.1141E-01	1.974E-01

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

----- S U M M A R Y -----
Total Activity (1108.7 to 2000.1 keV) 2.0665192E+01 pCi/gm
Total Decayed Activity (1108.7 to 2000.1 keV) 2.0669231E+01 pCi/gm

The library has energies which are not separable.

Analyzed by: _____
DAT

Reviewed by: _____
Supervisor

Laboratory: YAEC Chemistry Lab